SOLIDARITY & SCHISM: TWITTER NETWORKS OF EGYPT'S REVOLUTION

SOLIDARITY AND SCHISM: TWITTER NETWORKS OF THE EGYPTIAN

REVOLUTION

By DEENA ABUL-FOTTOUH, B.A.(HH), M.A.

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AUTHOR: Deena Abul-Fottouh, B.A.(HH), M.A.(The American University in Cairo)

SUPERVISOR: Dr. Tina Fetner

COMMITTEE MEMBERS: Dr. Melanie Heath
                                         Dr. Paul Glavin

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Abstract

This research builds on the social movements theory of networks and coalition building, the theory of digital activism, and the social networks theory of organizations to study the rich case of online mobilization for the 2011 Egyptian revolution. I use the analytical tools of social network analysis to study Twitter networks of activists of the Egyptian revolution in early 2011, when solidarity characterized the movement, and late 2014, when schism spread it apart. In this, I investigate how the repertoire of online activism relates to the on-the-ground movement. The social movements theory of networks states that activists' ideological congruence, the presence of bridge builders who bring the movement together, and the presence of previous ties among the activists are all factors of coalition building and movement solidarity. This dissertation tested the role of these factors in the Twitter networks of Egyptian activists. The results suggest that digital activism complements rather than mirrors on-the-ground activism. While all three factors influence the network, they manifest somewhat differently than research has suggested they do in offline networks.

This dissertation contributes to social movements theory of coalition building through adding validity to its application to digital activism, and suggests modifications to be made while applying this theory to the repertoire of online mobilization. The research has a methodological contribution through using cutting edge techniques of social network analysis to study Twitter networks of activists. Unlike earlier studies on the Egyptian revolution, this methodological approach revealed new findings that could not have been studied through other methods of research.

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To all the souls who bravely fought for their country to live in dignity

In loving memory of my father, Magdy Abul-Fottouh (1942-2008)

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Chapter 1

Theoretical Framework: Digital Activism and Network Theory of Social Movements

In January 2011, the largest uprisings in decades erupted in many Egyptian governorates. Activists and observers alike believe that social media played a major role in mobilizing these uprisings; one of their leaders and initiators titled memoir of the revolution *Revolution 2.0* because of this role (Ghonim 2012). Yet however instrumental social media was, the major events that shaped the revolution occurred in the streets.

Among activists for change, solidarity and schism have alternated since 2011. The three main ideologies that characterized the revolution were Islamist, liberal, and socialist. Islamists believe Islam is a political ideology as well as a religion. Liberals believe in a secular government, neoliberalism, and a neutral policy towards Israel and the United States. Socialists also believe in a secular government but support a socialist economy, the recognition of Israel as an occupation entity, and opposition to U.S. hegemony in the world. The three groups came together for three weeks in Tahrir Square in Cairo that January demanding the ouster of President Mubarak. The unity across groups with different ideological backgrounds was euphoric. The square rang with chants of "one hand" as Muslims and Christians and military personnel and civilians united in a successful effort to depose the president. The Coalition of the Youth of the Revolution was born at that demonstration, bringing together young people from diverse ideologies and becoming the most-vocal voice of the revolution.

The events that succeeded the January 2011 uprisings left the movement highly polarized by 2014. After the deposition of President Mubarak, the Supreme Council of Armed Forces took charge of a transitional period in which the country needed a new constitution and hold elections for a new President and legislative assembly. Revolutionary groups advocated for different strategies for the transitional period. The Coalition of the Youth of the Revolution and other youth groups that formed in 2011 preferred a radical way of change, while older movements such as the Muslim Brotherhood preferred a more reformist track. Debates over the new constitution took ideological taints, pitting Islamists against the socialists and liberals. Schism became extreme for the first time in November 2011 when the police and military attacked the protestors who camped near Tahrir Square. On November 18th 2011, all revolutionary forces called for a fast handing transfer of power from the military to a new president and a newly elected government. The newer and younger groups, which included families of the martyrs killed in the protests, remained in the square while the Islamists withdrew. In spite of condemnations by the remaining protestors of the withdraw, the Islamists won a majority of votes in the subsequent legislative and presidential elections in 2011 and 2012. Schism worsened a year later when the military deposed the elected Islamist president, Mohammad Morsi. Islamists rose in protest of the coup d'état in August 2013 and many of the liberals failed to condemn the massacres the military held on the protestors' camps.

While the greatest polarization separated Islamists from the secular groups, the socialists and the liberals also differed, notably in their response to the 2013 coup. This research therefore addresses ideological polarization among each of the three groups.

The prominence of the use of social media tools such as Facebook and Twitter from 2011 to the present raises questions about the relationship between social media networks and offline networks. This dissertation addresses the question as to whether the activists' online networks reflected the turns in the movement on the ground, an area previous research has not explored. Most research related to this area study how online tools speed or facilitate mobilization (Faris 2013; Castells 2012; Oh, Eom, and Rao 2012; Howard and Hussain 2013; Gerbaudo 2012), without addressing the questions this dissertation seeks to answer. These are: How do the structures of online networks of the activists who were involved in the revolution form? How did the ideological cleavages in these network structures evolve over time? How do they reflect their offline contexts?

In the course of testing the relationship between online and offline networks in its particular case, this dissertation sheds light on some central questions within social movement scholarship. They are: Can we apply the insights from social movements theory developed prior to digital communications technology to the world of digital activism? How can new methodological tools of social network analysis illuminate activists' online networks? What adjustments to social movements theory will make it fit online activism? The relationship between online and on-the-ground activism remains a crucial open question in the social movements literature in general; this dissertation

explores this relationship through a distinctive case that lends itself to the exploration by dint of the importance of social media and the distinct periods of schism and unity.

Three specific sets of research questions regarding social movements theory's understanding of the relationship between online and on-the-ground activism drive this research. First, I investigate whether the online structures of the Twitter networks of the activists of the Egyptian revolution reflect the periods of solidarity and schism that manifested on the ground. Second, I identify the activists who connected the online networks during periods of schism and compare them to on-the-ground brokers. Third, I examine the changes over time of the shape and cohesiveness of the network of Egyptian activists on Twitter, while deeply considering the conditions under which the ideological differences among activists hinder online networking as they hinder coalition building on the ground.

The dissertation harnesses tools of social network analysis to examine central questions in the social movements literature. I test whether the theoretical premises that traditional social movements theory established to explain on-the-ground activism apply to digital activism. My analysis contributes important insights to social movements theory, specifying the nature of coalition building in the digital era, testing questions of similarity and difference in online networks vis-à-vis traditional networks, and considering the effect of mobilization over time on online coalition building.

My analysis shows that traditional social movements theory can improve our knowledge about digital activism. However, at times digital activism seems to follow new rules, suggesting that it complements rather than mirrors on-the-ground activism. This

dissertation provides a model for future research to examine activism in the digital era, and offers suggestions for further research.

THEORY AND BACKGROUND LITERATURE

The Egyptian revolution is a rich case of digital activism. A variety of factors created movement solidarity at the beginning and schism later on. In order to understand the structures of online networks of activists of the Egyptian revolution and how these networks reflect the on-the-ground movement while changing between periods of solidarity and schism, this research employs a theoretical framework that unites the theory of digital activism, the social movements theory of coalition building, and social networks organizational theory.

As extensive use of social media characterizes this revolution, the first pillar of the theoretical framework for this research builds on theories of digital activism. While the revolution predominantly materialized in the squares and streets of Egypt, it provides one of the richest case studies of digital activism to date. Social media communications played a major role in mobilization. Activists relied heavily on social media websites for communication (Howard and Hussain 2013), and the number of users of Facebook and Twitter grew exponentially in Egypt in the first few months of the revolution (Esposito 2011).

The distinct periods of solidarity and schism makes it possible to use the Egyptian revolution to study movement shift from solidarity to schism online. This necessitates looking at the factors that bring activists together or make coalitions break apart. This

research therefore undertakes to identify the role certain key activists play in bringing the movement together and how the coalition built and dissolved over time. Because scholars have applied the social movements theory of coalition building to many cases of coalition formation and dissolution, this theory is the second main pillar of the theoretical framework of the dissertation.

Social networks organizational theory provides the third essential pillar of the theoretical framework. It offers important theoretical insights about how network structures are shaped and how communities within networks form. It proposes relevant understandings of how individuals' positions within networks determine their capacity to influence coalition building through brokerage. It also provides a set of empirical tools with which to examine networks of activists at different levels of analysis. Using it enables this research to detect and calculate with high precision communities within networks, and identify key activists based on their structural positions. Thus this research offers a nuanced portrait of digital activism in a political event that depended heavily on it.

Theories of Digital Activism

Digital activism has become a common repertoire that recent social movements use and a ubiquitous topic of research of recent literature of activism. Social movement scholars have looked at the advantages that this new repertoire offers to activism. Earl and Kimport (2011) suggest that digital activism offers the two main affordances of reducing the cost of organizing protests and decreasing the need for activists to meet physically together to organize activism. The more these two affordances are leveraged,

the more change is brought to the processes of traditional activism. Some roles that were the unique domain of traditional social movement organizations take different shapes in a web-enabled repertoire of activism.

These features of web-enabled activism made some scholars argue that online activism empowers the activists. Castells (2009) defines power as power of communication. In this view, power becomes the process through which the contenders shape and control the minds of their audience through communication. Power is "primarily exercised by the construction of meaning in the human mind through processes of communication enacted in global/local multimedia networks of mass communication, including mass self-communication [of which social media platforms are an example]" (Castells 2009: 416). Since power lies in the control of communication, counter-power relies on breaking this control. The processes by which the activists use online media to reprogram the minds of their audience are hence empowering to the activists. In building this theory of power, Castells (2009) mentions cases of success of online activism such as the 2008 "Yes, we can!" Obama's presidential campaign. This concept of empowerment can be helpful to understand periods of movement success. In the case of the Egyptian revolution, it can explain how online activism helps during periods of movement solidarity and success. Research has not yet explored how this concept of empowerment can apply during periods of movements' weakness. Can we still judge that online activism is empowering during periods of movement schism? The Egyptian revolution represents a good case study to test the theory of communication power, as it is a movement that fluctuates between periods of solidarity and schism. Through comparing

the online and offline repertoires of activism, this research tests more generally the claims

of the above theories on the advantages that the new repertoire of digital activism can

offer to social movements.

Literature on digital activism in Egypt and the Arab Spring.

The media labeled the 2011 uprisings of the Arab Spring, of which Egypt was a

part, the "Facebook Revolution" or the "Twitter Revolution," spurring a plethora of

literature from many disciplines addressing the role of social media in these

unprecedented events in Egypt's history. Research investigated the role online tools

played in bringing together Egyptians who share the same grievances to the virtual space

of the Internet (Howard and Hussein 2013, Lim 2012), or in directing those people to the

real public spaces that they occupied during protests (Gerbaudo 2012). Social media

created both networks of outrage in which people shared grievances and networks of hope

where they learnt about the successes of other movements in the Arab Spring, such as the

Tunisian revolution (Castells 2012). Activists used the virtual space to learn strategies of

protest and action and to share democratic values across borders (Howard and Hussein

2013). Some scholars also looked at the use of social media in the Egyptian revolution as

a double-edged tool of control by governments or of resistance by protestors (El

Hamamsy 2011). Others studied digital activism as a means to create "cascades of

information," where mainstream media picked the content that was circulating on social

media and shared it to a larger audience and how this process sped mobilization (Faris

2013). Much of these studies were theoretical, providing important food for thought about

how digital communications contribute to activism, but lacking in empirical tests.

Quantitative analysis explored activists' self-reports of their use of technology during protests, arguing that while digital activism played a role, other factors such as grievances and the surrounding physical networks of activists significantly distinguished demonstrators from sympathetic onlooker (Brym et al. 2014).

Other studies of the Arab Spring used tools of social network analysis similar to the ones this dissertation employs. Scholars focused on how information diffused through social media websites at times of protests (Howard et al. 2011; Lotan et al. 2011), how collective sense making formed online (Oh, Eom, and Rao 2012), how the use of different languages affected information diffusion (Bruns, Highfield, and Burgess 2013), and analyzed the content of news and how social media posts frame information (Meraz and Papacharissi 2013; Papacharissi and Oliveira 2012; Hamdy and Gomaa 2012).

Most of the literature on the role of digital activism in the Arab Spring belongs to what Earl and Kimport (2011) identify as the "scale change" school of thought. This school emphasizes, in keeping with the idea that it creates scale change, how online media extends the scale of the traditional social movement processes through providing the leverage of speed and reachability. Studies in this school generally apply to information sharing, and do not examine social media's ability to make fundamental transformations to social movement processes (van de Donk et al. 2004; Van Aelst and Walgrave 2004). They offer insight into the limits of digital activism and how activists used it to mobilize the Egyptian revolution. But they leave open the question of how key activists' online networks formed and how their online communications were structured.

Digital activism as a tool of sharing information: A diffusion paradigm.

The studies that examine how online communication made scale change offer important findings about the diffusion and communication of information during the Arab Spring, but I argue they miss an important aspect of social media's role. These studies focus on information diffusion rather than activists' networks. They employ a theoretical paradigm that casts social media websites primarily as tools for information diffusion or public mobilization during protests.

By using social movements theory, this dissertation does what earlier empirical studies of social media's role in the Arab Spring cannot: explain how the networks of the key activists in the Egyptian revolution formed online, why they took particular shapes, and the relationship between them and the networks on the ground. In order to do this, I embrace the idea of "model change," the alternate school of thought to "scale change" (Earl and Kimport 2011). According to this school of thought, digital activism follows certain rules of organization rather than being chaotic. Through explaining the logic of how communications happen online, this school provides an important background. Yet, most of the research in this area also belongs to a diffusion paradigm. Thus it mainly focuses on how information circulates online, or how social media tools mobilize or organize the crowds leading to the rapid growth of the movement.

"Model change" suggests social media changes the underlying mechanisms by which the processes of activism work, including mechanisms of building a shared consciousness and collective identity (Khamis and Vaughn 2011; Bimber, Flanagin, and Stohl 2005; Castells 2009, 2012), organization processes (Bennett, Segerberg, and Walker

2014; Bennett and Segerberg 2012; Agarwal et al. 2014), or even policing protest (Earl et al. 2013).

Most of the studies that look at social media's capability of creating model change have focused on Twitter. These studies have theorized about Twitter's model of information sharing and how it transformed the traditional processes of collective action organization. Some of these studies looked at the leverage Twitter offered by broadcasting dissent generally and its influence on western media's coverage of events in Tunisia, Iran, and Moldova in 2009 and 2010 (Poell and Darmoni 2012; Ems 2014; Lysenko and Desouza 2012).

Other studies focus on the role of Twitter in information diffusion and its effect on mobilization during periods of heightened protests. A recent study on the use of Twitter by the Occupy Movement in the United States, the Indignados in Spain, and the Aganaktismenoi in Greece showed that activists mainly used Twitter for political discussion or to communicate protest information rather than to organize or coordinate protests (Theocharis et al. 2015). Another study on the Indignados in Spain looked at how protest information circulated through different actors on Twitter (González-Bailón, Borge-Holthoefer, and Moreno 2013). These studies build their frame of reference on the effect of social influence to explain the sudden rise in the number of protestors in movements that mobilize online. They theorize that unlike the traditional models of mobilization, where people have to make rational decisions to join activism, Twitter and other social media platforms create a flood of information that encourages people to join the movement when they see their friends sharing news of their joining the protests on

Twitter. This creates a process of chain reactions through which movements grow. Collective action thus becomes a diffusion process driven by the number of people who join the protests and the fact that Twitter exposes those who did not yet join the movement to those who did (González-Bailón, Borge-Holthoefer, and Moreno 2013).

Some researchers have studied how Twitter brings changes to the model of policing protest. They describe it as creating a new model of activism that balances the asymmetries between the police and the protestors. For example, during the G20 protests in Pittsburgh in 2009, protestors warned one another about police action and locations through Tweets. This created symmetries in the control over information between the protestors and the police, as protestors were networked in a way that only police had been in the past (Earl et al. 2013).

Other studies have theorized that Twitter creates new forms of collective organization that were not present before. In Moldova, the speed affordance presented by Twitter and the fact that it communicates to many people at once helped coordinate a flash protest mob that grabbed public attention to the movement and fed participation (Ems 2014). Scholars theorized that the structure of the Twitter platform creates horizontal organization among the crowds, whereas other tools create hierarchical organization (Chadwick 2012; Earl and Kimport 2011). Specifically, it eliminates hierarchy by allowing activists who share a common point of view to share it in individual ways through what Bennett and Segerberg term "personalized action frames" (Bennett and Segerberg 2012; Bennett 2012). Or hashtags create conversations of equals among decentralized (Meraz and Papacharissi 2013). This manifested in the Occupy

Movement in that a "peer production" organizing process spurred the protests. The movement did not require recognized leaders or unified issue framing because of broad sharing of information and resource within a crowd (Bennett, Segerberg, and Walker 2014: 234)

In applying this new model of organization within the crowd, new digital communication tools follow a logic of "connective action" that is not based on traditional ideas of resource mobilization or collective identity (Bennett and Segerberg 2012). Thus, the production and processes of dissemination of online content produce "stitching mechanisms" that create crowd organization. Twitter itself becomes a "stitching technology" that links different platforms and networks together through processes like links to external platforms in tweets, Retweets, and the inclusion of multiple hashtags in one tweet, uniting communities. This process of stitching keeps the large-scale crowd from disintegrating (Bennett, Segerberg, and Walker 2014).

This literature does not show how the main activists or the leaders of the movement communicate with each other online. In explaining how the larger crowds communicate, usually through posting to the same Twitter hashtag that was created for a specific event, research that focuses on Twitter's ability to diffuse information misses the details of how the core activists of a movement network can work together. This becomes particularly important if the network of these activists change due to a changing political environment. The current dissertation focuses on the online networks of the core activists of the Egyptian revolution. Thus, it focuses on key activists instead of crowds.

This dissertation builds on data the existing literature has not and uses different methods: I analyze the structure of online communications directly by employing social network analysis tools. As I discuss in the next chapter, these tools allow us to identify which activists were speaking with whom online, and how the pattern of that communication reflected unity and schism.

The tools of social network analysis also allow me to identify the position of specific individuals within the online networks and to detect brokers between the ideological factions that existed throughout the period of the revolution. This approach, embedded in social network analysis, offers a new, empirically grounded lens through which to view the role of digital activism in the Egyptian revolution with new clarity.

Digital activism as a means of activists' networking: A networks paradigm.

Scholars of the diffusion paradigm see that the Twitter platform – in contrast to Facebook, for example – is more of an information sharing network rather than a social network (Lotan et al. 2011; Kwak et al. 2010). But evidence also shows that Twitter networks are networks for collaboration and conversations and not only networks of information diffusion (Honeycutt and Herring 2009; Boyd, Golder and Lotan 2010). Twitter networks show a high degree of reciprocity of relationships indicating close mutual acquaintances (Java et al. 2007), and they exhibit characteristics of real communities (Gruzd, Wellman, and Takhteyev 2011). Moreover, online networks of activists and politicians cluster based on ideology (Conover et al. 2011; Adamic and Glance 2005; Kelly, Fisher, and Smith 2005; Yardi and Boyd 2010). Looking at social

media platforms from this networks paradigm reveals the clusters in the networks and cleavages that separate them.

In offering insights as to how networks are structured online, this literature establishes ways to identify the prominent actors who bring online networks together. Evidence suggests a small number of users who are critically positioned in a network's structure distributes and filters most of the information within it. Hence, the intense activity of a small number of members who Retweet messages, not network topography, determines the dissemination of information on Twitter (Bastos, Raimundo, and Travitzki 2013; González-Bailón and Wang 2016). These critical nodes solidify a network and prevent structural holes (Jürgens, Jungherr, and Schoen 2011). Understanding Twitter as a community, research shows that position in a network has more impact than raw follower numbers, as people in middle positions have the opportunity to spread information to disparate parts of a network (Gruzd, Wellman, and Takhteyev 2011; Tremayne 2014).

While the networks paradigm illuminates the structure of activists' networks online and the role of key activists, the studies that use it generally only investigate one context of activism. They do not examine why activist networks form specific structures, or on the driving factors of change over time. The notable periods of solidarity and schism in the Egyptian revolution, if reflected online, call for such examinations.

To sum up, studies of digital activism, by employing the diffusion paradigm, have failed to examine the role of key activists. Studies that employ the networks paradigm address this role but do not explain the networks that unite them, especially under varying political environments. Thus a gap in the literature on digital activism remains.

To address the gap in research on digital activism, this study employs a branch of traditional social movements theory that addresses the shape of networks and how they change. The social movements theory of networks has identified factors that promote coalition building and those that lead to factionalism and coalition dissolution, but has not been applied to digital activism. In this dissertation, I borrow insights from the traditional social movements theory of coalition building or coalition dissolution to examine the shape of Egyptian activists' online networks in a period of solidarity and a period of schism. By testing the relevance of a theory designed to explain on-the-ground activism in relation to online activism, I contribute to the debate on the relationship between online activism and on-the-ground mobilization.

The Social Movements Theory of Coalition Building

The social movements theory of networks has recognized factors that facilitate or hinder coalitions among activists. These factors include the social and political contexts in which activism occurs. This includes contexts that offer an opportunity (Almeida and Stearns 1998; Staggenborg 1986) or pose a threat (McCammon and Campbell 2002; Reger 2002; Van Dyke 2003; Borland 2010). Scholars of framing theories of social movements have emphasized the usage of discursive mechanisms, the modes of frame alignment, and the creation of master frames as other factors that advance networking among organizations (Benford and Snow 2000; Mische 2003).

The factors that social movements scholars describe as facilitating coalition building include ideological congruence, the presence of brokers, and the preexistence of ties among activists. This research examines the role of these factors in the shifts from

movement solidarity to schism through only looking at the structure of online networks of the activists. Thus, the current study will not investigate the external factors or the framing mechanism that promoted unity or schism. Rather, each chapter of this dissertation tests the application of ideological congruence, the presence of bridge builders, or the sustainability of ties over time as factors that bring coherence to activists' online networks as they do on the ground.

   Ideological congruence as a factor of coalition building.

   Social movements theorists have established ideology as a cause of conflict within movements (Barkan 1986; Gerhards and Rucht 1992). Ideological differences can sometimes inhibit coalition building or lead to weak coalitions, even for groups with common goals (Roth, 2010; Guenther 2010). Similarly, shared ideologies and identities facilitate organizational collaboration (McCammon and Campbell 2002; Bandy and Smith 2005). Theorists of social structure have also stated that in-group cultural similarities can lead to the disintegration of society. Blau (1977; 1994) states that within-groups homogeneity increases local bonds but leads to societal fragmentation. Individuals avoid this fragmentation and prevent conflict through multi-group affiliations and intersections. The Axelrod model (1997) shows that the probability of interaction increases with cultural similarity, which changes a culturally fragmented network to a culturally polarized one. Global polarization occurs when similar individuals converge within their groups at the expense of out-group ties.

   Movements that bring together diverse ideological groups are vulnerable to fragmentation. In such cases, coalition building depends on broad, flexible ideologies that

make it easier for activists to converge on similar issues (Van Dyke 2003). Obach (2004)

finds that convergence around common master frames and a common collective identity

facilitates coalition building (Rose 2000). The example of labor organizations in the

United States exemplifies the barrier of diverse ideology and the power of common

master frames. The American Federation of Labor employed a common master frame and

therefore broadened their scope to include social welfare policies in order to merge with

the Congress of Industrial Organizations in 1955, after years of polarization because of

distinct ideologies (Cornfield and McCammon 2010). The need for common master

frames has also proven true under authoritarian regimes (Mische 1995; 2003).

Social movements theorists who endorse the importance of ideological

congruence in building coalitions argue that movement solidarity depends on groups with

divergent ideologies finding ways to overcome their differences and work together.

Otherwise, ideological differences inhibit coalitions and lead to periods of movement

schism where fragmentation occurs within movements and polarization is drawn along

ideological lines. Chapter three of this dissertation tests the effect of ideological

congruence in facilitating or hindering online networking during times of movement

solidarity or schism to examine whether the structure of these networks reflect the

movement on the ground.

Bridge builders as factors of coalition building.

A subset of literature on coalition building studies solidarity in movements

characterized by ideological differences. It shows that clear ideological differences within

a movement increase the importance of actors placed in intermediary structural positions.

Activists who occupy these intermediary brokerage positions can be more influential than leaders of the movement (Diani and McAdam 2003; Diani, Lindsay, and Purdue 2010). The concept of brokerage helps explain how activists overcome ideological differences within the movement to reach at least a temporary and tenuous solidarity.

Many studies have identified the importance of brokers in on-the-ground activism. For example, a study on the spread of the Social Democratic Party in Sweden showed the role of "socialist agitators" in creating a macro-network between an otherwise disjointed groups of actors and regions (Hedstrom, Sandell, and Stern 2000). Bridge builders facilitate coalition building. They can help overcome the class divide (Rose 2000) or the cultural and race divide (Grossman 2001) within a movement. They also contribute to the processes of frame alignment and building of master frames (Obach 2004; Isaac and Christiansen 2002). This dissertation takes these key insights about brokerage and applies them to the realm of digital activism.

The main focus of chapter four of the dissertation is to evaluate the role of brokerage in the online networks of the Egyptian revolution. Specifically, I use social network analysis to understand which activists acted as bridge builders in the online networks of the Egyptian revolution and whether their prevalence reflects what periods of solidarity and schism requires. I also investigate the different brokerage roles those activists played and compare them to on-the-ground brokers, especially at times of schism.

Previous ties as factors of coalition building.

A few studies have analyzed the effect of coalition building (Osa 2003; Ansell 2001; Diani and Kousis 2014) or coalition dissolution (Heaney and Rojas 2008) on activists' networks over time. For example, the formation of new coalitions has led to the rise of the Solidarity Movement in Poland (Osa 2003), while the dissolution of the anti-war alliance in the United States created opportunities for new groups to join the networks and play brokerage roles (Heaney and Rojas 2008).

Literature has also emphasized the role of pre-existing ties in coalition building. For example, past relationships among the HIV-AIDS International Non-Governmental Organizations was a best predictor of future alliances among them (Shumate, Fulk, and Monge 2005). This is mainly due to the trust and shared experience that collaborating activists build over time. Pre-existing social ties and past collaboration create levels of trust that reveal which groups are more likely to work together in future alliances (Corrigall-Brown and Meyer 2010; Levi and Murphy 2006). These pre-existing networks can be key in determining the success or failure of alliances. Along with ideological alignment, pre-existing networks among groups who were organizing for the Pittsburgh G20 protests in 2009 were key factors in determining the success of an event alliance and the failure of another in the anti-authoritarian movement (Staggenborg 2015). The incidence of informal alliances among individual activists correlates with prior collaboration, just as more formal alliances among organizations do (Wood 2012).

This research examines whether the presence of online previous ties increases the probability of future ties among activists online, as they do on the ground. To test this, chapter five investigates the effect of the presence of previous ties on keeping activists'

solidarity over time. It does so in the context of a movement that became very fragmented in 2014 after a period of unity in 2011. Thus, it investigates the interaction of factors that interact with previous ties in bringing the movement together, after showing that ties in 2011 predict ties in 2014.

The social movements theory of coalition building constitute a main pillar in building the theoretical framework of this research as it provides theoretical explanations of factors that make activists form alliances and movements shift from solidarity to schism. I apply the insights of these theories to the new and understudied realm of digital activism. In doing so, I build on these theories, which scholars of digital activism have neglected, to examine the online network among Egyptian activists. To do so, I turn to the third pillar of my theoretical framework, social networks organizational theory, which offers conceptual and analytical tools to examine how online community structures are formed, how activists cluster, and how brokers connect the different parts of networks.

Social Networks Organizational Theory

Social networks organizational theory informs this research as it offers a lot of conceptual and analytical tools to identify communities in networks, and connections among these communities (Newman 2006; Boyd, Fitzgerald, and Beck 2006; Krackhardt and Stern 1988, Borgatti and Everett 2000). It also offers rich conceptual definitions and tools to identify key actors in networks based on their structural positions (Freeman 1977; 1979; Borgatti 2006).

A branch of networks theory useful to this research examines the benefits of non-redundancy in networks and the leverage intermediary positions confer on actors. Burt

(1992; 2000; 2005; 2015) describes "structural holes" in a network and the individuals that span them by connecting with otherwise largely disconnected groups. Such actors can decide to take advantage of the opportunities in their structural network positions and achieve higher returns on their efforts. This type of network provides them with greater social capital and competitive advantage; it gives them access and control over early information. The number of non-redundant contacts that structural holes connect is then more important than the size of the network itself. This branch of theory informs the analysis of this research in that it helps define and identify brokerage positions in networks.

Some social movement scholars have used the insights that networks theory offer to study the topography of networks of social movements (Diani 2003a; Diani 2011), to track how different events connect together to form a national protest campaign (Diani and Kousis 2014), or to identify key activists (Diani 2003b). In one of the few studies that have applied Burt's theory in social movements research, Kim and Paff (2012) show that ideologically mobilized university students, "bridge actors," spanned the structural holes in the Protestant Reformation movement by bridging the gaps between evangelical theologians and local townsmen. Thus they created critical communities of university students that were key factors in the success of the Reformation.

A few studies have used the concepts and tools offered by social networks theory to study online political communities (Bryden, Funk, and Jansen 2013; Adamic and Glance 2005.) Of these, attention to online movements that connect to large protests, such as the movements of the Arab Spring, or that study specific concepts such as online

brokerage has been scarce (for an exception see González-Bailón and Wang 2016). This dissertation contributes to this literature that belongs to the networks paradigm and studies digital activism. I use the whole toolkit of conceptual and methodological solutions social network analysis offers to study the topographies of the Twitter network of activists of the Egyptian revolution. Thus I can investigate the major factions within the activist network, examine how activists connect to each other, measure how they evolve over time, and identify the activists who act as brokers.

Using the analytical concepts and rigorous tools of social network analysis, I can test the application of social movements theory of coalition building to online activism. While social movements theory lays the groundwork as to the importance of ideological congruence in coalition building, social networks theory permits me to identify the ideological clusters within the online network and how they link to each other. Likewise, it provides concepts and tools that help me detect brokerage positions, and offers techniques of regression analysis that are superior to regular statistical analysis as a means to study a network where the cases are dependent.

To sum up, the theoretical framework of this dissertation is built on three pillars. The first consists of theories of digital activism. I use these to understand how online networks form, adopting a networks rather than a diffusion paradigm. The second pillar consists of the social movements theory of coalition building. It reveals why the online networks I examine take a particular form, especially at different periods of solidarity and schism. The third pillar is the conceptual and analytical tools social networks

organizational theory offers. These tools allow me to apply the other two pillars and illuminate the connection between on and offline networks in the Egyptian revolution and the patterns that emerge in comparing the network of 2011 and the network of 2014.

ORGANIZATION OF THE DISSERTATION

The social movements theory of coalition building suggests that periods of movement schism feature ideological polarization while periods of movement solidarity feature frequent communication among individuals with diverse ideologies and convergence around common master frames. Activists who bridge the gaps among the different ideologies play a key role in movement solidarity. Separately, the presence of previous ties facilitates the future ties and prevents movement schism or fragmentation at later periods. The remaining chapters of this dissertation apply the theories this chapter has described and attempts to answer the research questions.

Chapter two presents a background of the Egyptian case study, describing the major events between the solidarity of 2011 and the schism of 2014, and the case's importance as an instance of digital activism. Chapter two also lays the methodological approach of this research. The three substantive chapters that follow each investigate one of the factors that social movements theory endorses as causes of coalition building: ideological congruence, presence of bridge builders, and the history of ties. In each chapter, I use the tools of social network analysis to test how social movements theory of coalition building applies to digital activism.

In addressing ideological congruence, chapter three uses network analysis to study whether the cohesion and ideological structure of the Twitter networks of the activists reflect the solidarity and schism that existed on the ground. It focuses on the following research question:

RQ1: Does network cohesion and ideological diversity in 2011 and fragmentation and ideological polarization in 2014 reflect periods of on-the-ground solidarity and schism in the Egyptian revolution?

Chapter four, uses the tools of social network analysis to identify the bridge builders who stitch the Twitter networks together and study whether these brokers were also brokers on the ground. Thus I focus on the following research questions:

RQ2: Which activists are bridge builders in online communications, and are they the same people who build bridges on the ground? How do online brokerage roles differ between periods of solidarity and schism?

In chapter five I look at the interaction of the presence of previous ties, which promotes coalitions, and ideological polarization, which tends to oppose it. I also use the techniques of social network analysis to determine the stability of online networks over time. The research questions that help clarify the driving causes behind the schism that was present in 2014 in chapter five are as follows:

RQ3: Can the preservation of previous ties help maintain coalitions among the early activists, as they do on the ground? How does the addition of new activists to the movement affect the coalition the original activists built?

The dissertation ends with a conclusion in which I lay out the main findings of the research and its theoretical and methodological contribution. I argue that the social movements theory of coalition building and the conceptual and analytical methods of social network analysis have proven rich sources of insight about the digital activism of the Egyptian revolution. I also show the research's contribution to the ongoing debate about whether online activism mirrors on-the-ground activism.

Chapter 2

Methodological Framework: A Network Analysis Approach

EGYPT'S CASE STUDY: MOVEMENT SOLIDARITY AND SCHISM

The Egyptian revolution represented the largest uprising in Egypt in decades and the second in the Arab Spring, a series of uprisings that transformed politics in the Middle East. It was the first time Egyptians removed a ruler through a massive mobilization of civilians rather than the military. Many events brought by new and creative means of mobilization comprised the revolution from 2004 till its outburst in 2011. The interaction of a diversity of stakeholders created a revolution and a counter-revolution and an intense military response. All this makes the revolution a very rich source of data for students of social movements, politics, and history.

The Egyptian revolution is also a rich case to test hypotheses relevant to social movements theory of networks and digital activism. It began with periods of solidarity despite diversity but ceded to fragmentation and ideological polarization. Moreover, there was broad use of social media to mobilize. The social media communications of the activists at different points in time represent an abundance of data that scholars can use to compare network structures and identify key activists. The relationship between these online networks and offline activism provides a rich area for study.

Role of Social Media in the Egyptian Revolution

Revolutionary online activity in Egypt coalesced long before the Egyptian revolution around 2004 with the rise of the Kefaya Movement, which called for an end to

the rule of President Mubarak and that his son Gamal not succeed him. At that time,

political bloggers –who many of them members of Kefaya– created a counter-narrative to

the government by sharing photos of protests and criticizing Mubarak's administration

(Al-Ani et al. 2012). As early as 2007, Egyptian bloggers were sharing online videos of

systemic torture committed in police stations.[1] Using English to reach to a broader

audience, they explained the political problems and human rights abuses in their societies

to the world (Lynch 2007). This prelude to the revolution was crucial in its formation,

creating a counter-culture in an authoritarian environment and an alternative to

government-controlled information. Isherwood (2008) distinguishes the first wave of

Egyptian blogging from the second and says that leftists dominated the first while

Islamists dominated the second. In the early 2000s, bloggers of different ideologies met in

rallies, joined together in online campaigns[2], and expressed solidarity with each other as

bloggers across the political and religious spectrum.

A few years after the spike in political blogging, most activists shifted their

activity to social media websites such as Facebook and Twitter. The revolution became

known as "Facebook Revolution" or "Twitter Revolution." Some groups, such as the

April 6 Youth Movement and We are all Khaled Said, were created through pages on

these sites and mobilized support primarily through them. Wael Ghonim, an Egyptian and

Google marketing executive created the "We are all Khaled Said" Facebook page in 2010

to raise awareness of the brutal way execution of Khaled Said in police custody in June of

that year. The group's name articulated a sense of shared victimization (Attia et al. 2011;

Lim 2012). Photos of the disfigured face of the young man stoked the anger of the

Facebook users in Egypt and thousands followed the page within 24 hours. Such events

put social media websites in the role of watchdog on the government. The RNN Arabic

Facebook page, which was created during the 2010 parliamentary elections in Egypt,

asked Egyptian users to monitor, record, and share information about electoral fraud,

creating a fleet of citizen journalists (Faris 2013). Videos shared through the page

triggered outrage that would feed the revolution.

Social media websites also facilitated the spread of the freedom meme across

borders; news of the success of the Tunisian revolution one month before the revolution

in Egypt influenced its beginning. As protests mounted in January 2011, Twitter became

the platform of the revolution, creating international pressure on President Mubarak to

resign (Howard and Hussein 2013). The Egyptian government cut the Internet during the

first week of protests, but protestors used the "Speak2tweet" service offered by Google to

subvert the actions. This service translated and disseminated voice recordings left through

international landlines into Tweets. When the government fully restored the Internet after

ten days, thousands of videos poured onto YouTube, showing police brutality towards

protestors (El Hamamsy 2011).

Protestors shared grievances and expressed solidarity on Twitter, YouTube, and

Facebook; forming what Faris (2013: 32) termed "informational cascades" as people saw

many of their friends posting online about their attendance at protests and decided to join

the revolution. These sites also became hubs for the fragmented opposition and for

democratization movements to come together and create a common counterculture

(Howard and Hussein 2013). Seeing 360,000 people responding in a very short time for

the calls to protests on the "We are all Khaled Said" Facebook page induced eleven

groups of disparate ideology that all opposed the government to meet and organize for the

protests on January 25, 2011, coinciding with Police Day in Egypt, the government-

imposed annual day of honor for police in Egypt (Soueif 2011).

Social media websites offered a fast and safe tool to subvert the limitations an

authoritarian regime places on a nation. Hashtags like #jan25 and #egypt created

conversations that became safe venues to coordinate tactics, ask for supplies of food and

water in Tahrir Square, warn activists about dangerous areas, and share information about

police violence. Tips on how to stand against rubber bullets and tear gas circulated.

Activists were even able to communicate with revolutionaries across borders to share

tactics (Kirkpatrick and Sanger 2011).

Levels of activity in Egypt on Twitter became a good barometer for street action,

and between November 2010 and May 2011—the first period of uprising—social media

websites were at the core of the network of political parties and groups in Egypt (Howard

and Hussain 2013; Howard et al. 2011). Egypt's Facebook users increased 12.16%

between January and February 2011, and Twitter users grew tenfold in January alone

(Esposito 2011). In this context, the Egyptian revolution is a rich case to study digital

activism.

The Beginning of the Revolution: A Period of Unity and Solidarity

In January 2011 people with a wide variety of backgrounds and ideologies shared

many grievances due to thirty years of Mubarak rule. In a period of stunning solidarity,

they created common master frames that became the mottoes of the revolution. Internet

use had boomed for a decade, making the formation of an online counterculture possible.

The Supreme Council of Armed Forces (SCAF), which opposed the planned succession

of President Mubarak's son because he lacks ties to the military, refused to defend

Mubarak's rule, which made the revolution possible.

Common grievances, common master frames.

The main slogans of the revolution—Bread, Freedom, and Justice—had been

shared demands of many revolutionary factions for a long time. Police brutality had

generated widespread suffering. Inflation and 25% unemployment had contributed with

broad dissatisfaction with the government. Corruption that extended to forgery of both the

presidential and parliamentary elections shook the state's legitimacy. Corruption had also

made possible the death of more than 1,000 people in a ferry in the Red Sea in 2006. The

callous actions of Mubarak and his sons in remaining at a sports event when given the

news of the disaster disgusted many Egyptians (Shafik and Hassan 2009; Fendi 2011).

Egyptians began to feel that they were living in police state under emergency law

imposed by a government that abandoned all its duties towards its citizens (Aljazeera

Documentary 2012).

People from all over the political spectrum opposed Mubarak's rule. In 2004,

many of them came together to form the Kefaya ("enough" in Egyptian colloquial

language) movement to call for an end to President Mubarak's rule and to reject the

succession of his son Gamal. A member has recounted meetings at which Muslims and

Christians, Islamists, socialist leftist Marxists, and liberals came together. They agreed to

put their ideologies aside, that at the meeting they were only Egyptians (Aljazeera 2012).

Kefaya ultimately dissolved into the National Association for Change, retaining this ideology of inclusion. In 2008, former members of Kefaya created the April 6 Youth Movement to support a workers' strike calling for higher wages, for the resignation of Minister of Interior Habib El-Adly who they held responsible for pervasive police brutality, and for an end to emergency law rule. These groups had many activist members in common. Mohammed El-Baradei, a former Director General of the International Atomic Energy Agency, formed the National Association for Change in 2010 with opposition leaders and intellectuals with a diversity of ideological allegiances to call for political reforms and constitutional amendments.

The murder of Khaled Said became a rallying point. Ghonim, a liberal as well as a Google Marketing Executive, invited Abdul Rahman Mansour, an Islamist who had been part of the Muslim Brotherhood, to assist in the administration of the Facebook page dedicated to commemorating Said. Ideologically diverse groups met in person to prepare for the uprisings to coincide with Police Day to articulate the call for an end to police brutality. The youth of the Democratic Front Party, the youth of the Muslim Brotherhood, the National Front for Change (Al-Baradei campaign for presidency), the April 6 Youth Movement and the Justice and Freedom Movement all came together (Aljazeera Documentary 2012; Kirkpatrick and Sanger 2011; Jensen 2011; Shehata 2012). In Tahrir Square in January of 2011 Christians stood guard over Muslims during their obligatory prayers; members of the Muslim Brotherhood fought side by side with socialists to protect the Square against the thugs sent to disperse the sit-ins.

The sense of unity continued for some time after the deposition of President

Mubarak. Political groups such as We are all Khaled Said[3] and the Muslim Brotherhood

(Aljazeera 2011b) issued statements calling on the Supreme Council of Armed Forces,

who was ruling the transitional period, for an end to emergency law. Demands converged

around freeing all political detainees, the formation of a technocrat government, and the

quick trials of the former President Mubarak, the former Minister of Interior, and all those

who were involved in killing the protestors during the first days of the revolution.

Internet: The rise of a common counterculture.

Blog data authored between 2004-2011 show that bloggers used it as a means of

dissent. Describing the early part of this period, Radsch (2008) identified a small number

of active bloggers between 2005 and 2006. In 2006, bloggers like Abdul Moneim

Mahmoud began to identify themselves as Islamists on blogs such as his "Ana Ikhwan" (I

am a member of the Brotherhood). Egyptian bloggers shared online video clips of

government repression of political protests and systemic torture in police stations against

Egyptian citizens as a means to defy government-generated narratives (Tavaana n.d.).

Social media websites connected bloggers and political activists, and they began to freely

deliberate about Egypt's problems on Facebook and Twitter, which led to the online

creation of significant groups such as the April 6 Youth Movement and We are all Khaled

Said.

When well-known political bloggers started joining Facebook and Twitter in the

years 2007-2009, their social media accounts became hubs as followers started forming

networks around each of them. These networks later became powerful tools in mobilizing

for the revolution (Faris 2013; Castells 2012; Azab 2012). Common identities and loyalties formed through the virtual networks. Political opponents of the regime who were once fragmented started to converge online to identify goals, build solidarity, and organize protests (O'Donnell, 2011). Conversations about the revolution on Twitter preceded major events in the streets, indicated when the rate of tweets from Egypt grew from 2,300 to 230,000 a day during the week before Egypt President Mubarak resigned (Howard et al. 2011). Through this powerful medium to voice dissent, members of different ideological backgrounds (liberal, Islamist or socialist), especially the youth among them who had easier access to the Internet, deliberated through webpages that played the role of brokerage among previously isolated groups (Lim 2012).

The army and the people are one hand.

The reason SCAF did not join the police in squelching protest has been debated. Some commentators argue the armed forces sided with the protestors in the revolution in their quest for a government more responsive to the citizenry. Others contend that SCAF only opposed Mubarak to prevent the succession of his son, who never served in the military (Hashim 2011; Suarez 2012). Regardless, the fact that the military refrained from using force to stop the revolution in January 2011 was pivotal.

As early as the third day of the revolution, the day protestors called "Friday of Anger," protestors took photos with military personnel deployed to Tahrir Square and hugged them atop military vehicles. Chants like "The army and the people are one hand" were first heard on that day (Ketchley 2014). For 18 days of protest the military refrained from taking action against protestors camped in Tahrir Square. Ideologically diverse

coalitions formed in the Square such as the Coalition of the Youth of the Revolution. A

prominent member of the Muslim Brotherhood, Esam ElEryan, announced on the 30th of

January 2011 that political groups in the opposition all supported ElBaradei in

negotiations with the regime (Reuters 2011). ElBaradei is a prominent liberal political

figure who was planning to run for president against President Mubarak before the

revolution. The military were well aware of these coalitions forming but did not intervene

to stop them. But four years later, the people and the military were no longer one hand.

Four Years Later: Fragmentation and Polarization

After President Mubarak was deposed in February 2011, activists started showing

signs of disunity. Revolutionary groups, which united on the clear goal of removing

President Mubarak, started trying to implement diverse agendas based on distinct

ideologies. Ideological differences surged to the surface. Activists differed as to strategy

for the transitional period. Factors that had built unity before the revolution contributed to

an increasing state of fragmentation and polarization. The former government's

oppression, which had created common cause, had long imposed isolation between

groups, and thirty years of distance led to major faults in the revolutionary movement.

Social media became a battleground for ideological differences. Forces of the counter-

revolution worked hard to divide the revolutionary movement in order to rule, and they

largely succeeded.

The battle of ideology.

On the 19th of March 2011, the SCAF government in Egypt held a constitutional

referendum to allow people to vote on changes to the constitution and a time plan for

parliamentary elections. An affirmative vote would hold parliamentary elections first so that the newly elected legislative assembly could write a new constitution. Newly formed liberal and socialist groups opposed at the referendum, believing that more organized forces such as the Muslim Brotherhood and the remains of the old regime's party would win elections held quickly. They sought delay in order to obtain a larger say in the new constitution. Others, including Islamist groups, advocated for it. They argued that quick parliamentary elections would bring stability to the country and permit the slow restoration of state institutions. In the ensuring ideological split, Egyptians began to see the referendum as essentially about Islam. This cleavage widened over time, to the benefit of the forces of the counter-revolution. The referendum passed and Islamists won a clear majority of almost 73% of the seats of the People's Assembly (BBC 2012). The first president after the revolution, Mohammed Morsi, belonged to the Muslim Brotherhood and rumors circulated that he would turn the country into an Islamist state. The military takeover that followed in July 2013 was also ideologically colored. Morsi's supporters, mostly Islamists, opposed it while many secular forces sided with the military.[4] The massacres that occurred in dispersing the camps of Morsi supporters in August 2013 increased ideological polarization. The anti-coup alliance that formed, the National Alliance to Support Legitimacy, consisted mainly of Islamist parties; attempts to recruit non-Islamists failed. Four years after the revolution, on the 28th of November 2014, the Islamist Salafist front called for a new revolution in Egypt but this time an Islamist one that they named "the battle of identity."

The Square or the parliament: Radical versus reformist tactics.

Conflict rises if social movement organizations differ in their conception of the amount of change and tactics required (Staggenborg 2015). In the United States, for example, radical organizations and labor organizations have conflicted because of their differing legal and political circumstances (Zald and McCarthy 2009). A major factor that helped Egyptian post-revolutionary polarization was the disparity of visions for change, strategies, and tactics of the different revolutionary groups. No group in Egypt had a clear vision for governance after the revolution. Opposition groups, which had been formed to organize protests and call attention to police brutality, had to think about how to run a state without any experience doing so. As opponents of the Mubarak regime, they had never been part of the bureaucratic machine that ran the country.

Even during the first 18 days in Tahrir Square, when Vice-President Omar Suleiman called for negotiations with the revolutionary groups, signs of divergence were evident. The Muslim Brotherhood, which had experience in how to communicate with the government for decades, agreed to sit at the table if they were promised President Mubarak would be deposed. They advocated for a reformist path as the best route to a smooth transition and avoiding direct confrontations with a fierce military apparatus. They had every hope of winning seats at the legislative assembly, having experience in mobilizing for elections and a large popular base that they built through long decades of charity service. Other opposition forces, the most vocal of which was the Coalition of the Youth of the Revolution, refused to negotiate until after the president was ousted (25 January Revolution 2011; Aljazeera 2011a). Newer groups more dominated by young people, that were leaderless and had a loose organizational structure, did not share the

point of view of the Brotherhood.[5] They continued to camp in Tahrir Square, seeking

greater reforms. A debate developed between remaining in the Square and creating a

parliament, creating cleavage. This debate intensified in November 2011 when some of

the pro-square forces decided to continue a sit-in with the families of the martyrs of the

revolution, calling for quick trials of all those involved in killing the protestors. In line

with their non-confrontational strategy, the Muslim Brotherhood declined to participate.

Brutal clashes with police ensued as the Brotherhood issued a statement stressing on the

importance of using the democratic path through elections through the transitional period

(Nafithat Misr 2011), saying the protests might postpone the elections and halt the

democratic path (Alyoum AlSabei 2011). More radical groups painted the Brotherhood as

traitors who failed the revolution (Elgomhoreya.tv 2012).

Internet: Conflict on social media.

Social media adoption continued to grow among politically engaged Egyptians,

but old political parties and politicians joined with their own ideologies and mobilized for

their own agendas. Online discussions became increasingly contentious. Anecdotal

evidence suggests that interactions online also became polarized. Unity online, of course,

had never been absolute. For example, there was an attempt in 2006 to create a code of

conduct for blogging that triggered discord (Isherwood 2008). Islamist bloggers requested

that content conflicting with Islam be banned on Egyptian political blogs and seculars

objected. Such ideological division was a harbinger of what followed the revolution.

Recent studies show that heightened polarization in Twitter hashtag usage

between Egyptian Islamists that were in power for the period from June 2012 to July

2013 and the secular opposition coincided with tension in society (Weber, Garimella, and Batayneh 2013). Using a special tool designed to measure the polarity of hashtags, a study shows that tension peaked in early December 2012 (Weber and Garimella. n.d.) At that time, President Mohamed Morsi had initiated a constitutional declaration targeting the forces of the counter-revolution. It led to high tension between the Islamist supporters of President Morsi and the secular opposition. June 29 to July 7, 2013, also saw heightened tensions and hashtag polarization amidst protests against President Morsi that ended in his deposition by the military. Interpretations of these events by the different ideological camps led to more tension in the Egyptian streets. The current study tests whether this ideological polarization reached the online networks of the core activists.

Divide to rule.

Thirty years of a single regime left the opposition fragmented, and it was in the interest of many parties to oppose the rule of the Muslim Brotherhood. The forces of the counter-revolution fuelled the divide between the revolutionary factions. Civil servants loyal to the prior regime decided not to cooperate with President Morsi.[6] The police refused to intervene for several hours during a riot at a soccer stadium in February 2012, a refusal that led to multiple deaths and was widely seen as revenge for perceived participation in the revolution (Finamore 2012).

SCAF, which was loyal to the older Mubarak regime, held power from February 2011 until the election of President Morsi in June 2012. Analysts put the Egyptian military's control of the country's economy at at least 15 percent; they have never been subject to parliamentary or state audit inspection so the precise figure is not known

(Tadros 2012). Some analysts believe that after the deposal of President Mubarak, SCAF had a clear vision as to how to pursue their interests and were not willing to concede to any structural transformations of the economy or society (Aljazeera 2014). This vision was built on squelching the revolutionary forces, each in isolation from the others, and increasing the tensions among them. Evidence suggests that SCAF remained in control even after President Morsi was elected. Critical ministerial positions in the Morsi cabinet, the intelligence bureau, and security apparatus all remained in the hands of individuals with ties to SCAF, former Mubarak loyalists. The military used the Egyptian Supreme Constitutional Court, whose judges were all appointed by Mubarak, to limit Morsi's efforts to restructure the state or expand his power (Baraka 2013).

When the military stepped in to remove President Morsi, liberals that had opposed him did not oppose the coup. Much as the left and liberals had labeled the Islamists months earlier, Islamists responded by labeling them traitors who failed the revolution. This ideological cleavage between pro- and anti-military intervention widened over time. A recent study on Twitter data from Egypt showed no correlation between favoring the military removal of Morsi and being secular, but a high correlation between being Islamist opposing it. The military takeover on July 3, 2013 led to a high increase in the volume of polarized tweets, with no signs of any ideological shifts from the pro- to anti-military camps among Egyptian Twitter users, especially after the massacres in August 2013 (Borge-Holthoefer 2015).

I picked the Egyptian revolution for the present research not only because of its richness or its inclusion of periods of clear solidarity and schism. It is ideally suited to test

my research questions as to whether social movements theories of coalition building

apply to digital activism. I am also in a position of being close enough to understand the

case without being biased. I was born in Egypt and speak Arabic as my native language.

My social network includes ties to many of the activists who camped in Tahrir Square

during the early days of the revolution. This helped me in the original stage of

determining the key activists and their ideologies. I was not present in Tahrir Square in

January 2011 but I attended many other protests in the course of multiple visits to Egypt

in the ensuring years. This gave me an idea of how activists organize on the ground. I also

consider myself one of the social media activists who were mobilizing people online

during the different stages of the revolution. My presence on Facebook and Twitter added

to my knowledge of the key online activists and to my understanding of how activists

communicate and use online tools for mobilization. It also gave me insight as to how

ideological cleavages formed online. Having these connections while studying the case

from a distant place gives me access to primary sources of information without the bias

other participants might have.

DATA AND METHODS

A Network Analysis Approach

	Many studies on the role of social media in the Egyptian revolution have taken a

theoretical approach (Castells 2012) or have based their methodological approach on

interviews with activists and their use of social media in mobilization (Faris 2013;

Gerbaudo 2012; Attia et al. 2011; Brym et al. 2014). Other studies used quantitative

techniques to analyze Egyptian tweets (Starbird and Palen 2012; Oh, Eom and Rao 2012). While social media is all based on networks between people, very few studies have used the analytical tools of network analysis to examine this case. These focus on identifying influential Twitter users (Choudhary et al. 2012), or studying polarization in the content of the hashtags (Borge-Holthoefer 2015). Networking among the totality of the activists and groups that advanced the Egyptian revolution has not been analyzed. This research addresses this gap using the rich techniques of network analysis methodology to study the structure of the Twitter networks of Egyptian activists and to identify brokerage roles prominent actors played.

Social network analysis is a methodological approach that best fits the nature of the current research. While a qualitative approach that is based on structural interviews with the activists would highlight the intentions of the activists in their online communications, a qualitative approach is not suitable for big data research and cannot grasp all structures of communications that form among the activists online, especially over time. A better approach for the purposes of this research is to use social network analysis to structurally investigate online links among the activists. Social network analysis offers more rigorous calculations of the structural metrics of the networks of the activists. It permits to spot the main communities and lines of cleavages in the networks and to highlight the main influential brokers. It also offers robust techniques for comparing networks over time. After collecting rich data through social network structural analysis, the findings can be a base for future qualitative research to complement and investigate any interesting results that would come out of this research.

Using the techniques of social network analysis is also a better approach than using the regular methods of traditional statistics, as social network analysis incorporates techniques that suit research where the cases are dependent.

Data Selection

Facebook has always been a more popular social media platform than Twitter in Egypt and the Arab world in general. A study published in 2015 shows that Facebook and Whatsapp are the most used social media platforms in the Arab region. Facebook usage in Egypt scored 94% among the sample of that study compared to 19% for Twitter (Arab Social Media Influencers Summit 2015). Any study using data collected from Facebook in the Arab region would offer a very rich dataset. However, because of the technical challenges associated with collecting data from Facebook due to its privacy settings and revealing of data, most of the studies on the Arab Spring and social media networks in general use data collected from Twitter. The data this study analyzes is a collection of Tweets gathered from Twitter accounts of Egyptian activists, political parties, and groups involved in the revolution. The analysis includes all political parties and social movement groups in Egypt that possessed an active account on Twitter in May 2014 (the time I collected the data).[7]

To make the list of activists, I began by searching Google for Egyptian bloggers using the keywords, "Twitter accounts of Egyptian bloggers." This produced a seed list of the most prominent bloggers. Literature review guided the collection of the names of "power bloggers," or activists who were bloggers long before the revolution started and who played a prominent role in the mobilization on Twitter during the revolution (Høigilt

2011; Shehata 2012; Faris 2013; Sullivan 2013). The list of Twitter users that Bel Trew

follows provided an additional source. Bel Trew is a Cairo-based print and broadcast

journalist specializing in the Middle East. Due to her job interests, her list of Twitter

friends is comprehensive and unbiased list of most of the prominent Egyptian activists

and bloggers.[8] I complemented this list using crowdsourcing, posting a request on

Facebook.[9] The request read: "Please list all activists you think were important in the

making of the Egyptian revolution." This process resulted in a list of 136 nodes that have

accounts on Twitter (37 political parties, seven political groups, and 92 activists). Two

experts in the Egyptian revolution who know some of the Egyptian activists and bloggers

in person reviewed the list to make sure it included every prominent activist.

Data Scraping and Collection of Tweets

       For each Twitter handle on the list of activists, political parties, or groups that I

compiled, I collected all Tweets that were posted during the two different time periods

studied. The time periods for which I collected the tweets are equal in length. The first

period runs from January 30, 2011 to February 11, 2011, which covers the main events

from the start of the revolution through the resignation of President Mubarak. The second

period runs from November 27, 2014 to December 9, 2014. This period witnessed

protests against a court ruling to drop all charges against former President Mubarak,

including the charges of killing the protestors in Tahrir Square back in 2011. It also

witnessed the mobilization for another uprising on November 28, 2014 and the

preparations for the celebration of the fourth anniversary of the January 25th revolution.

Ideological polarization affected the calls for the November 28th uprising, as Islamists led

the charge, calling it "The Uprising of Muslim Youth" or "The Battle of Identity." The

time gap between the two time periods was selected to show a contrast.

As the Twitter Application Program Interface (API) only gives free access to the

last 3,200 Tweets for any account, I purchased historical Tweets for the first time period

from January 30, 2011 to February 11, 2011 through GNIP, a social media API

aggregation company and the official provider of historical Twitter data. I used the

Twitter search API to collect data for the second time period from November 27, 2014 to

December 9, 2014. The search API is better than the streaming API, as it gives 100% of

the Tweets posted by any account. I collected data for the second time period on

December 10, 2014, to make sure not to miss any Tweets. The parameters for every

search made through GNIP or the Twitter API were the Twitter handles of every activist,

political party or group on the list of 136 accounts that I compiled. I asked for all tweets

written by every account for each period. Out of the 136 accounts in the list, only 112

posted on Twitter during any or both of the two time periods studied. I did the analysis on

these accounts.[10]

Ideology Assignment

I coded for the ideology of political parties and groups based on their ideologies

explicitly stated in their opinions, statements, and on their websites. Four coders

including me participated in assigning the label liberal, Islamist, or socialist to each of the

92 activists. Two of the other coders were activists with direct connections with people

that hold various ideologies, and the fourth is a former member of the cabinet after the

revolution and a former activist. The categories represent the three main ideological

groups that exist in the Egyptian political spectrum. In times of disunity, polarization

generally occurs along these ideological cleavages. Coders used activists' writings,

statements of their positions at different junctures, and affiliations with groups with

known ideological identities to assign categories. An Islamist sees Islam as a religion and

a political ideology. Liberals and socialists endorse a secular government. Liberals

endorse the creation of a neoliberal and capitalist economy in Egypt and the continuation

of Israel as Jewish state. Socialists support the re-establishment of a Palestinian state and

oppose what they see as American imperialism more generally. Coders assigned only one

ideology for each activist. Some activists have a prominent ideology with tendencies

toward another one, such as liberal Islamist. In these cases and for the purposes of

analysis, coders classified the activists based on the ideology they thought best described

the activist.

I calculated Intercoder reliability using ReCal3 ("Reliability Calculator for 3 or

more coders"), an online utility that computes intercoder/interrater reliability coefficients

for nominal data coded by three or more coders.[11] Results gave a Fleiss Kappa[12] of .826,

which, according to Landis and Koch (1977) is almost perfect agreement. Krippendorff's

Alpha, another statistic of agreement, is .827 ($\alpha \geq .800$), which also suggests the coding is

reliable.

Operationalization of the Networks

Various types of interactions represent networks on Twitter. The basic type of

relationship is when one user "follows" another's account, such that they see every

posting by the other user. People can "Retweet" another person's Tweet, thereby sharing

it on their own account. In a "mention" a person addresses another person publicly by using his or her Twitter handle. Since the "mention" shows up in the mentioned person's feed even if he or she does not follow the user who created it, mentions constitute direct addresses. They typically constitute direct responses (replies) to Tweets or drawing a person's attention to a topic. People can also relate to each other on Twitter by participating in the discussion of the same topics using the hashtag (#) symbol. Hashtag discussions usually gather people of common interests to exchange views on the same topics. In order to answer the question of whether ideology affects how people relate to each other on Twitter and to identify brokerage roles, I focus on the Twitter mentions network, as it represents a more direct type of conversation than following, Retweeting, or hashtag discussions. The mentions network is a directed network where the nodes represent the activists, and the directed ties are links of who mentions whom. It is also a valued network, as the strength of ties represents how many times one actor mentions another. The more one mentions the other, the stronger the communication between them.

Data Analysis

   Importing the tweets.

   I used ORA network analysis software (Carley 2014) to import Tweets that were originally in the Java Script Object Notation (Json) file format. ORA software transforms the imported Tweets into a "meta-network," or a network of sub-networks. Among these sub-networks is the mentions network, which this research investigates. I then used the various tools of UCINET network analysis software (Borgatti, Everett, and Freeman

2002) to analyze the structures of the imported mentions network and to test the research hypotheses.

Network analysis methods for ideological homophily and previous ties.

To study ideological congruence in Twitter networks during both time periods, I used community detection algorithms to identify how activists cluster into cliques based on their ideologies and whether this clustering differs between periods of solidarity and schism. As chapter three explains, I also used network specific regression and analysis of variance to test the effect of ideological homophily during the two time periods. Chapter five details my use of the same techniques to study the interaction of the effect of the presence of previous ties and ideological congruence in determining how the networks change from solidarity to schism between both time periods.

Analysis methods for brokerage.

To test whether online brokerage mirrors on-the-ground brokerage I employ various tools of network analysis to examine brokerage roles and identify activists with significant positions in the network, especially during the period of schism.

Following four theoretical definitions of brokers, this research identifies brokers as the activists who span structural holes in the network and who have access to non-redundant information (Burt 1992; 2000; 2005; 2015). They can be activists who appear on the shortest paths between all other activists in the network (Freeman 1977; 1979). Brokers can also be identified by their functional role in connecting similar or different ideologies (Gould and Fernandez 1989) or in terms of their influence in causing network fragmentation (Borgatti 2006).

For each of the above conceptual definitions of brokers, I used a corresponding network analysis tool to identify a broker. As chapter four explains, I measured the correlation between online and offline brokers to determine the connection between brokerage online and on the ground.

The above techniques of social network analysis are cutting-edge methods that can help advance social movements theory. Most of the methods that social movements scholars use are qualitative interviews or quantitative surveys. Social network analysis constitutes a distinct approach to understanding how the activists connect to each other, and helps highlight important key activists in the networks that cannot be identified using the other methods. Social network analysis is especially suitable to study online mobilization, which basically consists of a web of networks.

In the following chapter, I investigate the first factor of coalition building endorsed by social movements theory and test its application to online networks. Specifically, I test the first research question on the effect of ideological congruence on the structure of Twitter networks of Egyptian activists during periods of solidarity and schism.

Chapter Three

Ideological Congruence in Egyptian Activists' Twitter Networks

This chapter examines the Twitter networks of the activists of the Egyptian revolution to test whether online structures reflect cohesion and ideological diversity during periods of on-the-ground solidarity, and fragmentation and ideological polarization during periods of on-the-ground movement schism. The chapter tests the validity of the social movement theory of coalition building, which suggests ideological congruence plays a role in bringing activists together. This theory offers insights on how ideological polarization characterizes periods of movement schism and how activists can overcome ideological differences at times to forge movement solidarity. Scholars of online activism have not thoroughly studied its application to online networks. The current chapter shows that the theory applies to an online activist network in much the same way it applies to offline activism. Its results suggest that during periods of movement solidarity in the early days of the revolution, activists overcame ideological differences and extensively deliberated online. Four years later, Twitter networks replicated the fragmentation and ideological polarization that plagued the movement in the streets.

The remainder of this chapter proceeds as follows. The next section reviews the literature on the effect of ideology in online networks of the Egyptian revolution and the literature on ideological polarization online. It identifies the role of the social movements theory of coalitions in illuminating the workings of online activism. A detailed discussion of the methods of social network analysis I used to study ideological clustering and the

effect of ideology in shaping online networks at different time periods follows. I then

discuss the findings on network cohesion and diversity that turned into fragmentation and

ideological polarization. The conclusion highlights this chapter's contribution to research

on digital activism and suggestions for future research.

THEORY AND BACKGROUND LITERATURE

Two studies to date investigate ideological polarization in the Egyptian revolution

as evidenced on Twitter. The first investigates shifts in attitudes on Twitter between pro-

military and anti-military camps after the military takeover in the summer of 2013. The

researchers suggest that the pro-military/anti-military axis did not necessarily correspond

to a secular/Islamic divide (Borge-Holthoefer et al. 2015). The second study analyzes the

degree of ideological polarization of the content of Twitter hashtags on a secular/Islamic

axis. It shows that high Twitter polarization in hashtags' content corresponded with

periods of street violence (Weber, Garimella, and Batayneh 2013). Neither study overlaps

significantly with the current study.

Studies of digital activism unrelated to the Egyptian revolution have addressed

ideological congruence and polarization on Twitter. For example, empirical evidence

from tweets and political blogs confirms ideological polarization in Twitter networks

(Conover et al. 2011; Adamic and Glance 2005; Kelly, Fisher, and Smith 2005).

Ideological polarization within networks increases when controversy in the public

discourse is high; Twitter functions, such as the reply function, gain frequency as a means

to reinforce group identity with like-minded people and to argue with ideological

opponents, increasing polarization (Yardi and Boyd 2010). Most of these studies do not have overtime analysis and when they do (Hargittai, Gallo, and Kane 2008), they do not study networks that shift from different contexts of solidarity and schism. This literature leaves open the question as to how network structures differ among activists according to changing contexts.

The social movements theory of coalition building has been applied to offline activism to suggest how ideological context influences activists' networks. In relation to offline activity, this theory has established the factors that promote coalition building and those that diminish it. It suggests that ideological congruence and cultural similarities increase solidarity and coalition formation (Cornfield and McCammon 2010; McCammon and Campbell 2002; Lichterman 1995; Gerhards and Rucht 1992). It likewise shows that ideological differences can cause schism in and disintegration of social movements (Roth 2010; Guenther 2010). These theories align with theories of social structure, which state that internal homogeneity increases intra-group bonds but fragments society (Blau 1977). Network structures become culturally polarized when cultural similarity leads to increased interaction among similar people and the corresponding exclusion of others (Axelrod 1997). Movements with different ideological groups can become increasingly polarized and eventually factionalized if activists with similar ideology only connect to each other without creating a common ground to connect with other ideologically different groups.

Research as well as history reveals that movement solidarity can happen without ideological congruence. Social movements theory highlights the role of broad flexible

ideologies (Van Dyke 2003), common collective identity, and common master frames (Rose 2000; Obach 2004) in overcoming ideological differences. The presence of multi-issue organizations on American college campuses created similar issues for activists to converge around, which facilitated coalition building and working across movement boundaries (Van Dyke 2003). Similarly, when the American Federation of Labor widened its policy scope to include social welfare policies, it became ideologically similar to the Congress of Industrial Organizations, which facilitated their merger (Cornfield and McCammon 2010). In her research on Brazilian youth networks, Mische (1995; 2003) shows that under authoritarian regimes, ideologically neutral groups produce inclusive master frames that override sectoral differences. This body of literature has not addressed digital activism to date.

Existing literature defines periods of movement solidarity as periods of cohesion in which activists' networks overcome ideological diversity, and periods of movement schism as periods of fragmentation and ideological polarization. Based on these definitions, this chapter examines the effect of ideological congruence in facilitating or hindering online networks of the activists of the Egyptian revolution. I test the following hypotheses:

1- The Twitter network of activists of the Egyptian revolution was more cohesive and less fragmented during the earlier time period of on-the-ground movement solidarity than during the later time period of schism.

2- The Twitter network of activists of the Egyptian revolution was more ideologically polarized during the later period of on-the-ground movement schism than during the earlier period of solidarity.

DATA AND METHODS

Data Description

I collected all tweets posted from Twitter accounts of Egyptian activists, political parties, and groups involved in the revolution during two time periods—January 30 to February 11, 2011, and November 27 to December 9, 2014. The earlier period represents the early days of the revolution, concluding with the deposition of President Mubarak. Ideological diversity and cohesion reigned among the different revolutionary factions during this period. The later time period represents a period of movement schism on the ground. Chapter two has a full description of the methods of selection of activists, assignment of ideologies, the methods of scraping the tweets, and the choice of the two time periods.

The networks of the activists denote the mention relationship, where activists use the @ sign followed by the Twitter handle of another activist in order to address him or her. I consider the mentions network to be stronger, because it is a more direct relationship, than the Retweet network (in which people share what others post on Twitter), or the hashtag network (in which people participate in the same discussion but do not address one another). The mentions network is a directed valued network where the nodes represent the activists, and the ties are directed ties of who mentions whom.

The value of a tie represents the number of times an activist mentions the other. Chapter two describes the creation of the networks out of the collected tweets fully.

Social Network Analysis Techniques

This chapter tests two main hypotheses: the fragmentation hypothesis (1), and the polarization hypothesis (2). The first states that Twitter networks are more fragmented during the later time period than the earlier period. The second states that Twitter networks are more ideologically polarized during the later time period than the earlier period. Analysis of cohesion measures test the first hypothesis while tests of ideological homophelis investigate the second hypothesis. Some other analyses test both hypotheses, such as the core periphery analysis and clique analysis. All analyses are performed for each time period separately.

Investigation of network cohesion and fragmentation.

To test hypothesis 1, I look at overall measures of cohesion in the networks during both time periods. Cohesion measures reveal network cohesion by the weighted density of the network and the average weighted degree—a means to compare density of networks of different sizes. I examine network fragmentation through the component ratio and the fragmentation index, normalized measures suitable to compare networks of different sizes. The component ratio is the number of components minus one divided by the number of nodes minus one, and the fragmentation index is the proportion of pairs of activists that are unreachable (Borgatti, Everett, and Johnson 2013; Borgatti 2006).

I follow the analysis of the cohesion metrics with an investigation of network topographies during both time periods. A core-periphery analysis reveals whether

networks resemble an ideal structure of a dense core of nodes connecting to each other and peripheral nodes linking to the core with no connection to one another (Borgatti and Everett 2000). Many Twitter networks, including both broadcast and support networks, if they are not polarized, have a topography that resembles a core periphery model (Smith et al. 2014). A core periphery model can be an indicator of network cohesion if the core is large in relation to the size of the network.

I also investigate network topography through a community clustering analysis of the cliques in the networks. A clique is a maximal set of three or more activists in which each connects to all of the others, forming a tightly knit structure (Borgatti, Everett, and Johnson 2013:183). Clique analysis can indicate network cohesion or fragmentation; networks with fewer big cliques are more cohesive than those with many small ones.

Investigation of network diversity and polarization.

To test hypothesis 2, I investigate the topography of the networks again but this time through looking at the ideological composition of the members of the core and at the arrangement of the cliques around ideological lines of cleavage. I also test the significance of ideology in shaping Twitter network structures at both time periods.

I first look at the composition of the core members that resulted from the core-periphery analysis. A network with a diversified core where the members are not ideologically homophilous has minimal ideological polarization. I also look at the topographical arrangement of the cliques to test whether they cluster in an ideologically polarized structural form.

The next step involves testing the effect and significance of ideological homophily in causing network polarization. I test ideological homophily through three levels of analysis: (1) the macro-level, whether people of the same ideology in the whole network tend to mention each other more on Twitter, (2) the micro-level, whether the ideology of particular activists is associated with their level of homophily, and (3) the meso-level, whether in-group ties are more prevalent than out-group ties for each ideological group separately.

The macro-level of analysis involves quadratic assignment procedures (QAP) to examine the effect of ideology, the independent variable, on the level of homophily of the whole network, the dependent variable. The independent variable is a binary network where a tie of one between two activists indicates that they both share the same ideology, and a zero indicates they are different. The dependent variable is the valued mentions network, in which ties reflect activist's addressing each other on Twitter using the @ sign. QAP is a type of correlation test designed for network analysis where the cases are dependent. The significance of the observed correlation is calculated through comparing it to the correlations between thousands of pairs of matrices that were generated through random permutations of one of the original matrices. The permutations are just a rearrangement of the old matrix, meaning they preserve its same original properties (Borgatti, Everett, and Johnson 2013:129).

On the micro-level of each individual node, I conduct a node-level analysis of variance (ANOVA), taking the Yule's Q of each activist as a proxy of his/her level of homophily. Yule's Q is a good proxy for homophily as it is a standard measure of

association that is insensitive to category sizes and indicates ego-alter similarity based on both the ties and the non-ties in the network. Looking at the non-ties illuminates homophily as activists can choose to speak to others not necessarily because they are from their same ideology but because of proximity. Non-ties among proximate activists is a better proxy for homophily than ties alone (Borgatti, Everett, and Johnson 2013:273). The larger Yule's Q is, the more homophilous an activist is.

To execute the meso-level analysis of the different ideological groups, I look at whether each group has more in-group ties than out-group ties. I do this through the categorical constant homophily ANOVA, which tests the hypothesis that actors prefer to interact with members of their own group, assuming that all the ideological groups have equal tendencies to connect to each other (Hanneman and Riddle 2005: Chapter 18).

FINDINGS

Findings show that the Twitter network structures of activists of the Egyptian revolution reflect the solidarity and schism in the movement on the ground. A cohesive, ideologically diverse network of activists mentioned each other freely during the early days of the revolution. Four years later, the Twitter network structure of Egyptian activists is more fragmented and ideologically polarized.

Twitter Network Structure of Activists: Cohesion Turns to Fragmentation

Hypothesis 1, the fragmentation hypothesis, states that the Twitter networks of activists turn from cohesion to fragmentation between the two time periods, mirroring the on-the-ground networks. To test this hypothesis, I analyze the metrics of cohesion of the

mentions network during the two time periods, investigate the number and size of cliques, and determine the size of the core relative to the rest of the network.

Data description and cohesion measures of the mentions network.

Many people in Egypt joined Twitter after the revolution, believing it would play a significant role in mobilizing for the revolution and as an effective means to get news. Activists and newly-formed political parties joined because they believed Twitter would amplify their voices. As of March 2014, Egypt became the second producer of Tweets in the Arab region, accounting for 17% of Tweets worldwide. The number of active Twitter users in the region quadrupled from 131,585 users in May 2011 to 519,000 in March 2013 (Arab Social Media Report 2014). The number of users participating in the activist Twitter network increased by the second time period, especially among the Islamists, as Twitter became popular among new Islamist parties in Egypt (Table 3.1).

Table 3.1. Data Description and Cohesion Measures of the Mentions Network

	Early Time Period January 30, 2011–February 11, 2011	Late Time Period November 27, 2014– December 9, 2014
Number of Tweets	28,861	36,149
Number of Activists	53	112
Number (%) of Liberals	32 (60.4%)	58 (51.8%)
Number (%) of Islamists	7 (13.2%)	33 (29.5%)
Number (%) of Socialists	14 (26.4%)	21 (18.8%)
Number (%) of Isolates*	7 (13.2%)	33 (29.5%)
Density**	1.021	.059
Average Weighted Degree	53.113	6.571
Number of Components	24	76
Component Ratio	.442	.676

Fragmentation Index	.500	.782

Isolates are nodes that did not use the mention feature to establish network connections.
** Density is weighted, calculated on valued, rather than binary, edges.

All four indicators were aligned in showing lower density and greater

fragmentation during the later period than the earlier period, with the lower density and

average weighted degree and higher component ratio and fragmentation index.

Network topographies: size of the core and the cliques.

In the earlier time period, the mentions network structure shows a high

correlation, .8, with an ideal core–periphery model, and 26% of the network (14

members) show in the core. For the later time period, the correlation between the

mentions network and an ideal core–periphery model is .4, suggesting that the network is

either more fragmented or more polarized. The core consists of 16 members, 14% of the

network. Table 3.2 shows the density matrices between the core and periphery blocs. The

smaller proportion of the size of the core relative to the network during the later time

period suggests that the network became more fragmented as less people mention each

other or appear in the core.

Table 3.2. Density Matrix for the Core–Periphery Model in (a) 2011 and (b) 2014

	Core	Periphery			Core	Periphery
Core	.758	.139		Core	.367	.022
Periphery	.198	.017		Periphery	.061	.008
	(a)				(b)	

To further investigate the fragmentation hypothesis, I calculated the size and

number of cliques in each network. In the early time period, some cliques reached the size

of 12, a dense conversation of people all mentioning each other on Twitter. Moreover,

there were more cliques during the later time period compared to the earlier time period

(93 compared to 57 cliques respectively). The relative size of the cliques and their

number indicate a more cohesive and less fragmented Twitter network of activists in the

earlier period as expected.

Results of the cohesion measures and topography of the networks indicate a

denser, more cohesive network of activists during the earlier time period that turned to a

more fragmented structure during the later time period, confirming the first hypothesis of

the research. The question now becomes whether ideology played a role in this

fragmentation, which requires testing the polarization hypothesis.

The Transformation of Diversity into Ideological Polarization

To test hypothesis 2, the polarization hypothesis, which states that ideology had an

impact on the structure of the Twitter networks, I test whether ideological homophily

during each time period suggests the Twitter networks of activists mirrored the offline

activist network in that ideological diversity became polarization. I look at the ideological

composition of the members of the core, the arrangement of the cliques, and run

ideological homophily tests on the macro, micro and meso levels of the network.

Ideological composition of the core members.

The core members of the early time period are more ideologically diversified than

the later period. The 14 members of the early core include socialists, liberals, and two

Islamists (table 3.3). Most of them began blogging and organizing rallies together after

the rise of the Kefaya Movement in the mid-2000s. The early core includes Abdel

Moneim Mahmoud, an Islamist who uses the Twitter name Moneimpress. He is the

blogger activist who started the first Islamist blog of the Muslim Brotherhood. His

friends, activists who launched the "Free Monem"[13] campaign after his arrest in 2007

include activists from different ideological backgrounds. The later core is more

ideologically uniform, with 13 members who generally identify as liberal out of 16

members. These network topographies suggest that the Twitter network mirrored the

offline network in terms of greater polarization.

Table 3.3. Twitter Names and Ideologies of Core Members During Both Time Periods

Early time period January 30, 2011–February 11, 2011		Late time period November 27, 2014–December 9, 2014	
Ideology	Twitter Name	Ideology	Twitter Name
Liberal	demaghmak	Liberal	demaghmak
	minazekri		minazekri
	Sandmonkey		Sandmonkey
	Zeinobia		Zeinobia
	NohaAtef		amrelhady4000
	Ghonim		DaliaEzzat_1
Islamist	moneimpress		hossambahgat
	mosaaberizing		MaLek
Socialist	alaa		malekadly
	manal		mrmeit
	wael		NadyaHassan
	waelabbas		TheBigPharaoh
	3arabawy		Zelaky
	AhmedFatah	Islamist	3yyash
		Socialist	3arabawy
			Waelabbas

Arrangement of the cliques on ideological cleavage lines.

Cliques overlap since the same activists can be members of more than one clique.

A visualization of the arrangement of cliques in the network shows the role of ideology in

determining clique membership. Figure 3.1 shows a visualization of the clique

participation matrix, a valued network of links between the activists and the cliques in

which they participate. The strength of the links in the clique participation matrix shows

the extent to which an actor is a member of a clique (which means if the strength of the

link = 1, then the actor is a member of the clique; if the strength of the link = .8 then he is

linked to 80% of the other members in the clique). Visualization of the clique

participation matrix brings people who share many cliques together in proximate

distances to each other. Figure 3.1 shows a clique participation bimodal matrix (actor x

clique), where ties were filtered to only show those that are greater than or equal to .5—

meaning members who link to at least half of the members of the clique.

(a)   (b)
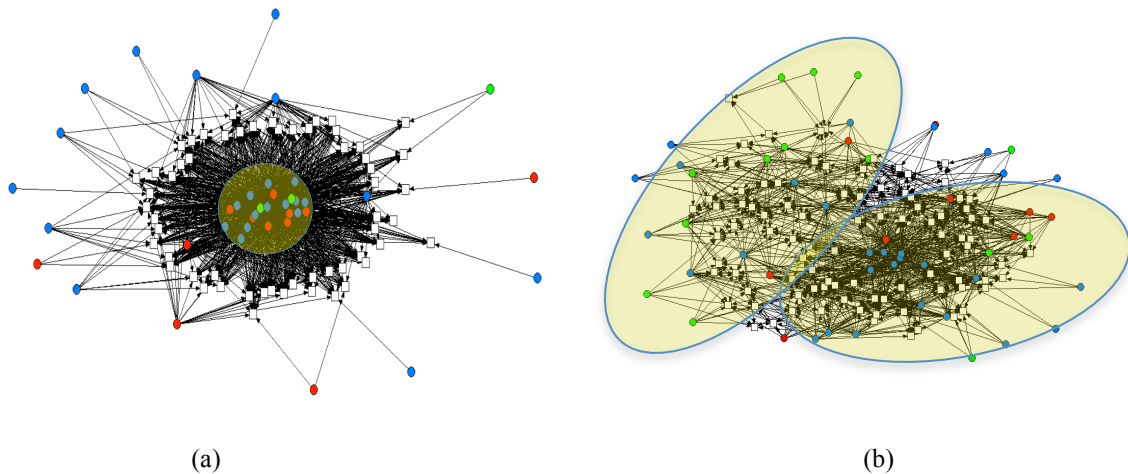
Figure 3.1. Twitter clique participation networks in 2011 (a) and 2014 (b). Isolate nodes are removed. Ties
(member participation in the clique) are filtered at .5. Nodes are colored based on ideology. Blue: Liberals;
Green: Islamists; Red: Socialists. White squares are cliques.

The members of the core in the early period all share many overlapping cliques (Figure 3.1a). These cliques reflect activism that precedes the revolution, such as the participation by Abdul Moneim Mahmoud, one of the Islamists, in online campaigns calling for freedom of political detainees with other bloggers from different ideologies (Faris 2013). Analysis suggests he played the role of a broker between different ideologies, in the early period, as he participated in more than 20 cliques with the members of the core group. These findings conform to results from other studies, which show that the followers of topics related to Egypt during the initial period of the revolution have a diversity of social group affiliations (Choudhary et al. 2012).

During the later time period, the hierarchical clustering of the clique overlap network —the network of members who share the same cliques—shows two main groups whose members share the same cliques. The first group is mostly liberal (65.2%), with Islamists the second largest ideology (17.4%). The second group has far fewer liberals (44%) and more Islamist members (37.5%). Visualization of the clique participation matrix for the later phase of the revolution indicates that the activists cluster more into ideological groups than in the earlier phase. Figure 3.1b shows the Islamists (in green) who cluster at the left of the chart while the liberals (in blue) cluster towards the right.

Ideological homophily during periods of solidarity and schism.

Homophily is connection due to similarity (Mcpherson, Smith-Lovin, and Cook 2001). The composition of the core members of the networks and the arrangement of cliques suggest that ideological homophily had an impact during the later time period of the revolution. To

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test the effect of ideology and the significance of its impact during both time periods, I

conduct homophily tests on the macro, micro, and meso levels of analysis.

Do people of the same ideology tend to mention each other more on the overall level

of the Twitter networks?

For both time periods, I use QAP on the whole network level to test whether people of

the same ideological background mention each other on Twitter more than they mention

people from other ideologies. I specifically test the effect of being of the same ideology, the

independent variable, on how activists mention each other, the dependent variable. Results of

the QAP during the early time period of the revolution (Table 3.4) show that ideology was not

significant in deciding how activists mention each other on Twitter (p=.122).

Table 3.4. QAP of Effect of Ideology on the Mentions Network of
Activists During the First Time Period in 2011

	Unstandardized Coefficient	Standardized Coefficient	P As Large[++]	P As Small[+]	P As Extreme[+++]
Same Ideology	.622	.035 (.509)	.122	.878	.122
Intercept	.747	.000 (.000)	.000	.000	.000

Note: Numbers in parentheses are standard errors.
* p< .05, ** p<.01, *** p<.001

[+] *The "proportion as large" value gives the proportion of random permutations that yielded a coefficient as large as the observed value. It serves as the significance when testing a positive hypothesis (i.e., one that predicts each coefficient is positive). It is a one-tailed test.*

[++] *The "proportion as small" value gives the proportion of random permutations that yielded a coefficient as small as the observed value. This serves as the significance when testing a negative hypothesis (i.e., one where the coefficient is expected to be negative). It is a one-tailed test.*

[+++] *The "proportion as extreme" value gives the proportion of random permutations that yielded a coefficient as extreme (i.e., with an absolute value as large) as the observed value. This provides a 2-tailed significance test.*

As Table 3.5 reflects, for the later time period of the revolution, ideology

correlates with the pattern of mention on Twitter (p=.024).

**Table 3.5. QAP of Effect of Ideology on the Mentions Network of
Activists During the Second Time Period in 2014**

	Unstandardized Coefficient	Standardized Coefficient	P As Large[+]	P As Small[++]	P As Extreme[+++]
Same Ideology	.040	.027 (.018)	.024*	.976	.024*
Intercept	.044	.000 (.000)	.000	.000	.000

Note: Numbers in parentheses are standard errors.
* p< .05, ** p<.01, *** p<.001

[+] *The "proportion as large" value gives the proportion of random permutations that yielded a coefficient as large as the observed value. It serves as the significance when testing a positive hypothesis (i.e., one where the coefficient is expected to be positive). It is a one-tailed test.*

[++] *The "proportion as small" value gives the proportion of random permutations that yielded a coefficient as small as the observed value. This serves as the significance when testing a negative hypothesis (i.e., one where the coefficient is expected to be negative). It is a one-tailed test.*

[+++] *The "proportion as extreme" value gives the proportion of random permutations that yielded a coefficient as extreme (i.e., with an absolute value as large) as the observed value. This provides a 2-tailed significance test.*

The above findings suggest that at the early phase of revolution, where the network is

heterogeneous and denser, ideology does not have an effect in determining how people

communicate with each other. Later on, when the network becomes more fragmented,

ideology starts playing a significant role in how people communicate with each other; which

indicates more ideological polarization during the later stage.

Is activists' ideology associated with their level of homophily?

The macro-level analysis suggests that an ideology determines activists' level of

homophily. To further test this association, I take Yule's Q as a proxy for homophily for each

activist, and run node level ANOVA to test the difference in the average homophily of the

three ideological groups. ANOVA shows a significant difference in the average means of

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homophily during the later time period (F = 3.31 with 2 DF and p=.041). The differences in

group means account for 8% of the total variance in Yule's Q scores among the activists. On

the other hand, the early time period showed no significant difference (F=1.8 with 2 DF and

p=.174). These results confirm that the ideological background of the activists did not

interfere with their level of homophily during the early period, but that later on a turn towards

polarization caused an association between ideology and homophily.

Are in-group ties more prevalent than out-group ties for each ideological group?

On the meso-level of analysis, I compare whether each group has more in-group ties

than out-group ties. To do this I compare the differences in the patterns of mentioning within

groups to the patterns of mentioning if the ties were assigned at random. Table 3.6 shows the

results of a type of ANOVA test that assumes that there is a constant homophily for the three

ideological groups and tests the significance of in-group ties.

Table 3.6. Constant Homophily ANOVA within and between Ideological Groups During Both Time Periods

First time period in 2011					
	Unstandardized Coefficient	Standardized Coefficient	P As Large[+]	P As Small[++]	P As Extreme[+++]
Intercept	.747	.000	.881	.119	.881
In-group ties	.622	.035	.119	.881	.119
Second time period in 2014					
Intercept	.044	.000	.977	.025	.977
In-group ties	.040	.027	.025	.977	.025*

*p< .05, ** p<.01, *** p<.001*

[+] *The "proportion as large" value gives the proportion of random permutations that yielded a coefficient as large as the observed value. It serves as the significance when testing a positive hypothesis (i.e., one where the coefficient is expected to be positive). It is a one-tailed test.*

[++] *The "proportion as small" value gives the proportion of random permutations that yielded a coefficient as small as the observed value. This serves as the significance when testing a negative hypothesis (i.e., one where the coefficient is expected to be negative). It is a one-tailed test.*

[+++] *The "proportion as extreme" value gives the proportion of random permutations that yielded a coefficient as extreme (i.e., with an absolute value as large) as the observed value. This provides a 2-tailed significance test.*

Findings show that there is no significant difference in the patterns of networking within or between groups during the early time period, but that during the later time period in-group ties are more common. This indicates a greater presence of ideological homophily and polarization in the later period. Results at the meso-level of the ideological groups confirm the previous findings at the macro and the micro levels. There was more ideological polarization during the later time period than the first.

The analysis converges to support hypothesis 2: the ideological composition of the core groups, the organization of cliques around ideological lines, and the findings of the homophily tests on different levels of analysis all suggest ideological polarization characterizes the Twitter network of activists during the later time period, while ideological diversity characterizes the early period. In 2011 activists deliberated on Twitter regardless of the differences in their ideologies. In 2014 they polarized.

DISCUSSION AND CONCLUSION

The structures of the Twitter networks of Egyptian activists, at the beginning of the revolution and nearly four years later, mirror both the on-the-ground solidarity of 2011 and the schism of 2014. The analysis shows that, similar to the unity on the ground, heterogeneous ideologies deliberated freely on Twitter to form a common counterculture that facilitated mobilization for the revolution during its early days. Nearly four years later, the Twitter mirrored offline networks as well.

During the earlier phase of the revolution, activists densely mentioned each other, regardless of their ideological background. The mentions networks formed a big heterogeneous group composed of core bloggers of different ideologies. Activists entered into large cliques, addressing other members across ideological divides. During the later phase of the revolution, Twitter networks became more fragmented and cliques became smaller and more polarized, especially among the liberals and the Islamists.

Analysis on the network level, individual level, and group level indicate that, while the early phase of the revolution lacked ideological homophily, ideology started playing a role in the later phase. It determined mentions and the level of homophily of individuals and groups. People who share the same ideology mentioned each other more than they mention others from different ideologies in the later period. Similarly, ideological groups had more in-group ties than out-group ties. It is clear during this period that ideology is associated with activists' level of ideological homophily.

While this chapter shows greater fragmentation and ideological polarization in the Twitter networks of activists during the later period of the revolution, it does not claim to identify the causes behind this polarization. Chapter five of this dissertation investigates the driving forces behind polarization through distinguishing the different networks of the early activists and those who joined later. Regardless of which group made the shift towards more fragmentation or polarization, this chapter provides evidence that this shift influenced the network of activists on Twitter, as it did on the ground.

This chapter contributes to research on digital activism through using the insights of the social movements theory of coalition building. The analysis has shown the applicability of

social movements theory to the shifts from solidarity to schism online. Ideological congruence can lead to online movement polarization and schism, as happened during the later phase of the revolution. Yet, activists of different ideologies can overcome polarization for periods and find ways to communicate and share common master frames. When these moments of solidarity occur, such as during the early days of the revolution, it manifests online as well as offline. This research suggests that social movements theory of coalition building applies to online networks, as they do to networks on the ground.

This chapter contributes to a core debate in digital activism: whether online activism mirrors the on-the-ground movement (Gladwell 2010, Faris 2013, Gerbaudo 2012, Castells 2012). This chapter asserts that online networks mirrored the ideological clustering that existed at different phases of the Egyptian revolution. Contrary to what previous literature has achieved by classifying social media tools as either platforms of polarization or networking, this analysis shows that, in the context of a revolution, Twitter correlates with the solidarity or schism in the movement more broadly. The findings of this chapter make it possible to understand the shifts in the movement from different contexts of solidarity to schism, and informs our understanding of the relationship between the two repertoires of online and on-the-ground mobilization.

The longitudinal nature of this study makes it possible to explain the leverage a social media tool added to mobilization, speeding and augmenting it in the early period. It also shows how social media was a tool of polarization in the later period. These results suggest that online tools do not just amplify the scale level of activism. These tools have the potential

to bring a model change to the processes of activism through facilitating or hindering the networks of activists at different time periods and political contexts.

This chapter also offers an important methodological contribution. Borrowing the techniques of social network analysis enriches our understanding of traditional social movements theory and theories of digital activism. Social network analysis offers techniques, such as the core periphery and clique analyses, that traditional social movements research does not use, but that help us to investigate community clustering in networks. These techniques can rigorously test the ideological clustering and polarization that exist at different contexts. Social network analysis also offers the leverage to study social movements on the macro, micro, and meso levels as I did in this chapter, which other methods do not make possible.

The findings of this chapter thus highlight the need for further research to study ideological networking within movements at different levels of analysis and over time. It invites future research to study more cases that involve the role of ideology in shaping activists' networks that could be compared at different points in a movement's progress. In general, it suggests the need for more research that focuses on inspecting the social media networks of activists rather than just studying how social media platforms expand mobilization or how information circulates online. Social network analysis will offer rigorous tools to scrutinize the structure of the networks. This chapter also calls for qualitative research or machine learning studies on text categorization and text recognition to analyze the content of the tweets. Such research would complement the current study, revealing what the activists

deliberated about online at different periods. It will permit, for example, an identification of how themes differed in periods of solidarity and periods of disunity.

In conclusion, this chapter provides evidence that social movements theory on the role of ideology in coalition building applies to online activist networks. The Twitter networks of the Egyptian activists reflect the solidarity and the schism that characterized the movement on the ground, suggesting that the two repertoires of activism are not separate. In the next chapter, I look at another cause of coalition building that helps bringing activists together— the driving forces that stitch the networks together, especially at times of schism. In chapter four, I identify and inspect the roles of bridge builders in the Twitter networks of the activists of the Egyptian revolution.

Chapter 4

Brokerage Roles and Strategic Locations within Twitter Networks of the Egyptian Revolution

Throughout the course of the Egyptian revolution that started in 2011, the revolutionary movement has experienced periods of solidarity characterized by activists' network cohesion and ideological diversity, and periods of schism characterized by network fragmentation and polarization along ideological lines. Chapter three showed that this was true for activists' online networks as it was on the ground.

One of the important factors in bringing up movement solidarity is the presence of activists who cross over ideological lines and bring activists' networks together. Important processes in connecting activists' online networks, such as the presence of these brokers-activists, have been understudied in research on digital activism in general and do not show in research on the Egyptian revolution in particular. This chapter fills this gap and investigates the important process of brokerage in the online networks of Egyptian activists.

Chapter three of this dissertation tested the first factor of coalition building, which is ideological congruence. This chapter tests the application of the second factor of coalition building to online networks, which is the presence of brokers-activists. Social movements theory of coalition building recognizes the importance of the presence of bridge builders and brokers to connect activists' networks. In this chapter, I examine whether brokerage roles among ideologies differ between times of solidarity and schism.

Through looking at the Twitter network structures of Egyptian activists, I identify those who occupy strategic brokerage positions that connect activists of different ideological backgrounds. I compare the prevalence of those brokers during periods of solidarity and schism. In line with the main argument of this dissertation that looks at whether online activism reflects the on-the-ground movement, I also compare the online brokers to the ones on the ground.

Examining the empirical case study of the Egyptian revolution reveals that, in compliance with social movements theory of coalition building and similar to on-the-ground activism, brokers who connect the different ideological groups online were more prevalent during periods of movement solidarity than schism. However, online brokers are not the same as on-the-ground brokers. Both realms play different activism roles and complement each other in advancing the movement.

The following section introduces the theoretical background of this chapter, building on social movements theory of coalition building and the social networks theory of brokerage. After presenting the methods section, the findings consider both the application of social movements theory of coalition building to the online networks of Egyptian activists, and whether online brokers correspond to on-the-ground brokers. The discussion section reflects on the application of social movements theory of coalition building, which are designed to explain on-the-ground mobilization, to online activism; and on how the study of online networks adds to our knowledge of the limits of online mobilization and its relation to the movement on the ground.

THEORY AND BACKGROUND LITERATURE

Scholars disagree about the impact of online activism on the movement on the ground and the relationship between these two worlds. Views vary between those who see online social media tools as profoundly shaping modern protest (Shirky 2010; Castells 2012; Earl and Kimport 2011) and those who see these tools as inducing "slacktivism" and creating a dillusion of real activism (Morozov 2011; Harlow and Guo 2014). Others take a middle ground asserting the importance of linking the two realms of online and on-the-ground activism (Faris 2013; Gerbaudo 2012; Iskander 2011).

This chapter studies the relation between the two realms through investigating online and on-the-ground brokerage. Few studies use social network analysis to examine the role of online brokers to diffuse information during periods of protests (González-Bailón and Wang 2016; Theocharis 2013) and no studies have examined online brokerage for the Egyptian revolution or how online brokerage roles mirror offline brokerage.

The research builds on social movements theory of networks and uses the analytical tools of social network analysis to study brokerage in the Twitter networks of the activists of the Egyptian revolution. I first look at the applicability of social movements theory of coalition building, which was designed to explain on-the-ground mobilization, to online networks. Then, I use the conceptual definitions of brokerage advanced by social networks theory to identify the activists who played online brokerage roles and test whether they correspond to on-the-ground brokers.

Social Movements Theory of Coalition Building

Proponents of the social movements theory of coalition building have argued that actors who occupy intermediary structural positions between different ideological groups in a movement are more influential than actors who have the same number of ties but are concentrated within particular groups (Diani and McAdam 2003; Diani, Lindsay, and Purdue 2010; Obach 2004; Rose 2000). These activists play an important role in increasing mobilization and advancing the movement, as contention that spreads through brokerage spreads more widely than through diffusion (McAdam 2003:295). Brokerage thus raises contention to the level of "scale shift mobilization" involving activists with a wide range of points of view (McAdam, Tarrow, and Tilly 2001:331). Positing what he coins as the "diffusion and scale shift paradox," Vasi (2011) argues that contention spreads fast when brokers connect ideologically similar groups, while it had the longest reach if brokerage connects diverse groups. In other words, "bridging ties" that cross-cut political ideologies are more important than "bonding ties."

Consequently, the social movements theory of coalition building suggests that increased activities of movement brokerage correlate with times of solidarity (Kim and Pfaff 2012; Ansell 2001; Hedström, Sandell, and Stern 2000). One way to test whether online mobilization networks reflect on-the-ground networks is to test the applicability of the above theories, which were designed to explain on-the-ground mobilization, to explain online networks. Chapter three stated that more fragmentation and ideological polarization characterized the later period of Egypt's revolution in 2014 than the beginning of the revolution in 2011 (See also: Weber, Garimella, and Batayneh 2013;

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Choudhary et al. 2012). It seems likely that more activists will connect the different ideological groups and bridge the Twitter networks gaps between the Liberals, the Islamists, and the socialists during the earlier period of the revolution than the later period, given that solidarity and schism, respectively, characterized these periods. This leads to the first hypothesis of this chapter:

Hypothesis 1- Online networks contain more brokers who connect the different ideological groups during periods of solidarity than periods of schism.

Social Networks Theory of Brokerage

Another way to investigate whether online activism mirrors on-the ground mobilization is to test whether online brokers correspond to on-the-ground brokers. This chapter builds on four different conceptual definitions of brokers sanctioned by social networks theory:

Brokers as spanners of structural holes.

One way to identify brokers on the micro level of each actor's ego-network is through the concepts of "structural holes" and "structural constraint." Burt (1992; 2000; 2005; 2015) suggests that some actors in networks connect people who are otherwise disconnected, or bridge a structural hole between two people or two groups of people. Individuals with a network rich with "structural holes" have lower constraint and better networking with various disconnected groups than those without such holes. Such networks confer a competitive advantage on brokers who rejoice from access to referrals and to early information. Their power comes from the number of non-redundant contacts in the network, rather than its actual size. A few researchers have attempted to apply the

concept of structural holes to movement analysis (González-Bailón and Wang 2016, Han 2009; Kim and Pfaff 2012; Robnett 1997). In the context of a revolution, especially during periods of ideological schism, many structural holes can form within the network of activists. This chapter identifies online brokers who span structural holes, bringing the Twitter network together. Then it compares those online brokers to on-the-ground brokers. The hypothesis pertaining to this theory tests brokerage on the micro-level of each activist's ego-network:

> Hypothesis 2A: The activists who span structural holes in online networks will also be brokers on the ground.
>
> *Brokers lie on the paths that connect most activists in the network.*

Another way to identify brokers on a macro level of the whole network is through identifying actors who lie on the paths connecting to most of the activists. In network terms, brokers are actors who lie on the shortest paths between all the other actors and who possess high betweenness centrality (Freeman 1977; 1979). There is a debate on the role these brokers can effectively play in online networks. Some earlier studies assert that Twitter networks center on particular individuals who play important roles in Twitter community building and as information sources (Gruzd, Wellman, and Takhtayev 2011; Theocharis 2013). In the case of the Arab Spring online movements, key individuals played a role in the diffusion of news (Lotan et al. 2011) and as brokers between Arabic and English language tweets (Bruns, Highfield, and Burgess 2013). Yet, González-Bailón and Wang (2016) in a recent study assert, "only a minority of users bring online networks together and facilitate global dissemination in protest communication" (p. 96). This

debate is about the role of brokers in online networks; the relation between online and on-the-ground brokers remains to be studied. Based on the above theoretical definition of brokers, hypothesis 2B tests brokerage on the macro level of the whole network:

Hypothesis 2B: The activists who lie on the shortest paths between most of the actors in online networks will also be brokers on the ground.

Brokers are liaisons between rather than within ideologies.

A third way that social networks theory identifies brokers between groups of different ideological backgrounds is functional—through identifying the type of groups the broker connects and hence the specific role the broker plays in the network. Merton (1968) distinguishes two types of brokers (or as he calls them "influentials"): the "local" broker who connects socially similar others and the "cosmopolitan" broker who connects diverse factions of the network. Social networks literature distinguishes the roles brokers play between and within groups. "Liaison" brokers are important in connecting people or groups of diverse backgrounds, while "coordinator" brokers connect similar people (Gould and Fernandez 1989). This chapter builds on this literature to study the different brokerage roles Egyptian activists played in their Twitter networks. I specifically look at the type of brokerage the activists who helped unite the network during the later period of the revolution performed. This tests brokerage in terms of the functional role of the brokers through the following hypothesis:

Hypothesis 2C: The activists whose brokerage role is a cosmopolitan liaison, connecting three different ideologies online, will also be brokers on the ground.

Brokers as gatekeepers in the network.

Other studies looked at the roles brokers on Twitter play as gatekeepers of information (Meraz and Papacharissi 2013). These actors can facilitate information diffusion but can also hinder its circulation by filtering or not sharing it at all (Jürgens, Jungherr, and Schoen 2011). The removal of such actors from the network can fragment it, curtailing its power. Brokers are hence identified through looking at how effective they connect the network and the effect of their removal on increasing network fragmentation. Hypothesis 2D tests brokerage in terms of the impact of brokers in hoarding or disrupting the flow within the network:

> Hypothesis 2D: The activists who connect a large portion of the online network and whose removal adds to online network fragmentation will also be brokers on the ground.

Through testing the above hypotheses, I investigate whether the activists who bonded the Twitter online networks also connected the movement on the ground through entering into coalitions. The goal is to shed light on the important relation between the two realms of social movements that mobilize both online and on the ground. This relationship needs more attention if we are to understand the dynamics of new protest waves involving both extensive use of social media and on-the-ground activism.

DATA AND METHODS

Data Selection

The dataset this chapter analyzes is the same collection of Tweets gathered from Twitter accounts of Egyptian activists, political parties, and groups involved in the revolution. I investigate Tweets that were posted during the two time periods studied. The first period runs from January 30, 2011 to February 11, 2011, and represents the period of solidarity and the second period runs from November 27, 2014 to December 9 representing a period of schism (See the methods section in chapter two for details of this dataset).

Operationalization of Brokerage

   Operationalization of on-the-ground brokers.

   Testing the hypotheses requires an operationalization of on-the-ground and Twitter brokers. For the purposes of this chapter, a proxy for the individuals who occupied on the ground brokerage roles is being a member of the Coalition of the Youth of the Revolution. This group, a coalition of diverse ideological groups, connecting Islamist, liberal, and socialist movement groups, was established during the early days of the revolution in Tahrir Square to form. It was the central most vocal organization of the revolution, representing a unified voice in opposition to the Egyptian government. Activists of this coalition are proxy for on-the-ground brokers as they were able to cross over their ideological differences and came together in one coalition representing a central link connecting different revolutionary factions. If Twitter brokerage roles mirror on-the-ground brokerage, I expect to find that Twitter brokers will also be members of the Coalition of the Youth of the Revolution.

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There are some advantages and limitations associated with using the Coalition of the Youth of the Revolution as a proxy for on-the-ground brokers. The advantages are that it was the only coalition that encompassed many diverse ideologies since the beginning of the revolution, embodying the concept of brokerage across ideological lines, it was mainly composed of young activists who use social media as a way of communication and activism, and it played an active role in representing the revolution during the period of Tahrir Square. The challenges are that the coalition was not active during the second time period compared to the first time period and that there were other coalitions during the second time period that could have been taken as a proxy. The first challenge is one that faced all activists that were operating in Egypt during the second time period because of the state's crackdown on all sorts of political activism; it is not only specific to the Coalition of the Youth of the Revolution. While the coalition was not active as an aggregate group during the second time period, many of its members were active as individuals in opposing the coup d'état. They used anti-coup satellite channels and social media as venues to express their opposition. The other coalition that existed during the second time period was "The National Alliance to Support Legitimacy." This later coalition was mainly composed of Islamists and Islamist parties that opposed the coup d'état and supported the legitimacy of President Morsi, calling for his return. The National Alliance to support legitimacy can be a good proxy for a research on brokerage within the Islamists rather than across various ideologies, which does not match the objectives of this research. A better approach to study the brokerage role the Coalition of the Youth of the Revolution played would be to conduct structural interviews with

members of the coalition, a task that was not possible during the period of conducting this research due to the crackdown on activism, but that is left for future research to investigate guided by the findings of this research.

Operationalization of online Twitter brokers.

According to the definition of a broker as a person who spans a structural hole (Burt 1992), Twitter brokerage consists of passing information via Twitter between two persons who do not know each other online. Brokerage may or may not lead to a virtual or in-person connection between the two persons. Consider the example of three Twitter accounts A, B, and C. If C follows A on Twitter, B follows C and neither B nor A follow each other, C is the broker who can relay information about A to B, as follows:

1- If C names A in a tweet using the "@" sign, B's Twitter feed will reveal what C says about or to A. B will get the same information if C names A using ".@" (the "@" sign preceded by a period ".") at the beginning of the tweet.

2- If C .@ A at the beginning of a tweet and A replies, B can see the full conversation if he or she opens C's profile, because B follows C, even though B doesn't follow A.

3- If C shares what A wrote through using the Retweet function, B's Twitter feed will show what A originally wrote and that C considered it worth repeating. If C retweets A using the feature "Retweet with a quote," B sees A's original statement and C's comment on it.

In all of the above cases, C performs Twitter brokerage in that he or she communicates information about A or what A says to B, someone otherwise unconnected to A. B may

decide to follow A or not; they still share a network because of C and information A provides on Twitter may reach B again because of C.

Twitter brokerage does not necessarily play the role of a "tertius gaudens" (third who rejoices) as in the case of the broker Burt identifies. Burt (1992; 2005) suggests that the broker gains a competitive advantage out of bridging structural holes. Twitter brokers are more of a "tertius iungens" (third who joins; Obstfeld 2005). C does not necessarily benefit from the gap between A and B. Rather, they introduce people to each other, which might advance the coherence of the network, in this case the revolutionary movement. One of the characteristics of "tertius iungens" brokers is that they either introduce disconnected individuals or facilitate new types of coordination between connected individuals. On Twitter networks people can get to know each other through different connections, so it is hard to use a structural hole between two people to one's advantage. In the case of the Twitter uses the current study addresses, the ultimate goal of Tweeting is the advancement of the revolutionary movement, which makes material advantage to an individual likewise unlikely. Han (2009), studying the brokerage role Paul Revere played in the American Revolution, acknowledges this dynamic; there is a need to take into consideration a broader scope of brokerage roles that encompasses non-competitive settings where the goal is the benefit for the whole movement to advance.

Under normal circumstances, B may not notice C's mention or Retweet of A. Thus, studying the effects of C's making information A shared available to B requires examining periods when B was likely paying attention to C. One way to measure such attention is if B was mentioning C during the period studied. Hence, the network studied

for this part of research is a "follows-mentions" network of the later time period in which

a tie exists if an activist both follows and mentions the other activist.

Analytic Approach to Measure Brokerage

This chapter uses different analytical tools and methodological concepts of social

network analysis to test the research hypotheses. I employ various tools of UCINET

network analysis software (Borgatti, Everett, and Freeman 2002) to examine brokerage

roles and identify activists with significant positions in the network.

To test hypothesis 1, I compare brokerage roles of the activists during periods of

solidarity and schism through studying the most prevalent type of brokerage for each time

period. Gould and Fernandez (1989) described five types of brokerage roles (Figure 4.1).

(1) Coordinator   (2) Consultant   (3) Liaison   (4) Representative (←)
                                                                (5) Gatekeeper (→)
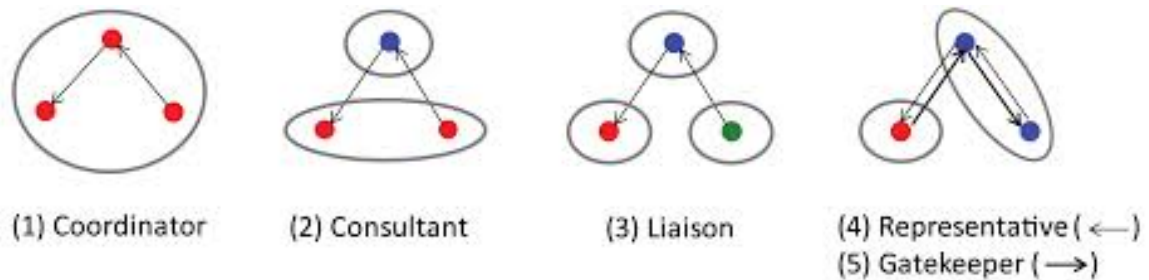
Figure 4.1. Illustration of brokerage roles of Gould and Fernandez in a directed network. The colored nodes
represent the activists; the colors represent affiliation with different ideological groups.
Source: (Gehlert et al. 2015:16)

In each type of brokerage, the broker connects two previously disconnected activists.

Coordinator brokers connect two activists, both of whom share their ideological group.

This type of brokerage reinforces cohesion within the same ideological groups of the

network. Consultant brokers connect two activists who share an ideological group with

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each other but not the broker. Representative and the gatekeeper brokers both connect an activist from their own group to another from a different group; they differ in the way information flows. Liaison brokers, the focus of the analysis here, play a crucial role in connecting the different groups in the network. They connect two activists who belong to two different groups that are both different from their own—in this research, connecting the liberal, Islamist, and socialist groups. Liaison brokers thus add to the overall coherence of the network rather than intra-group coherence. Therefore, another way to state hypothesis one is that online liaison brokerage will be more prevalent during the early period of solidarity than during the later period of schism.

The analysis gives a brokerage score for each activist. I study the relative rather than the raw brokerage score as the former considers the number of ideological groups within the network as well as the size of each group. The relative score is the raw score divided by the value that is expected if the activists belonged to the same group sizes but had random assigned connections (Hanneman and Riddle 2005: Chapter 9). An activist is considered a broker if his or her relative brokerage score for any of the above five categories is greater than one, meaning greater than expected in a network of similar group sizes but where the ties are assigned at random.

To test the rest of the hypotheses related to whether online brokerage mirrors on-the-ground brokerage, the rest of the analysis focuses on the later, fractured time period. Periods of schism, when the gaps between groups widen, render brokers, especially liaison brokers, more important than periods of solidarity. I use the "follows-mentions" network for this analysis to grasp Twitter brokerage as operationalized above. Following

the four theoretical definitions of brokers discussed in hypotheses 2A to 2D above, a

corresponding network measure or type of analysis tests each hypothesis. In each case the

correlation of being identified as a broker in the online networks and being a broker on

the ground (as measured by being a member of the Coalition of the Youth of the

Revolution) tests whether online brokerage positions and roles correspond to on-the-

ground brokerage.

      The first analysis considers brokerage at the individual level of the ego-network of

each activist. It identifies brokers as the activists who span structural holes in the network

and have access to non-redundant information. In other words, it looks at actors who

connect otherwise disconnected activists (Hypothesis 2A). Two measures ("effective

size" and "reinforced structural holes") address the effectiveness of each broker to span a

structural hole. The "effective size" is a proxy of the non-redundancy in the broker's

network (Burt 1992; 1995; Borgatti 1997) while the "reinforced structural hole" refers to

holes between different groups that are cohesive within themselves to the exclusion of

others (Burt 2015). This feature makes spanning a reinforced structural hole more

difficult than spanning a regular structural hole. For this reason, the activists who span a

reinforced structural hole have access to more novel information and less redundancy.

      The second analysis looks at brokerage on the macro level of the whole network.

It isolates the activists who appear on the shortest paths between all other activists in the

network (hypothesis 2B). This is done through a measure of betweenness centrality,

which Freeman (1979) defines as "the frequency with which a point falls between pairs of

other points on the shortest or geodesic paths connecting them" (p. 221). Actors who lie

on the shortest paths in the network are central and have the ability to either facilitate diffusion or disrupt information in the network.

The third analysis considers the functional definition of brokerage through detecting the type of brokerage role that the activist has in the network. The analysis identifies brokers with inter-group connections instead of intra-group connections (addressing hypothesis 2C). Using the terminology of different brokerage roles Gould and Fernandez (1989) advance, the analysis looks for a measure of "liaison" brokers who connect the three different ideologies in the network.

The fourth analysis to identify brokers indicates the set of activists whose removal would disrupt the network through affecting the diffusion of information or adding to online network fragmentation (hypothesis 4). This employs the measure of KeyPlayer (Borgatti 2003; 2006). The measure identifies a set of key nodes who can be used as seeds for optimal diffusion of something through the network or whose removal would fragment the network.

In sum, the analysis compares the different roles brokers play during periods of solidarity and schism to test whether social movements theory of networks designed to explain on-the-ground movements can apply to online settings (hypothesis 1). Following that, in-depth analysis of the second time period characterized by movement schism uses four definitions of brokers sanctioned by social networks theory to identify online brokers and see whether they reflect offline brokers (hypotheses 2A-2D).

FINDINGS

Brokerage Roles During Periods of Solidarity and Schism

Following social movements theory of networks and the Gould and Fernandez (1989) brokerage types discussed above, it is suggested in hypothesis one that the early period of the revolution will have a greater incidence of liaison brokerage than the later period, because of greater unity in the early period and fragmentation in the later period. Table 4.1 shows the numbers and percentages of activists who showed a significant relative brokerage score for each time period respectively. If the value of the relative brokerage score is greater than 1, the activist plays this type of brokerage significantly more than expected in a randomly assigned network. While columns 2 and 5 in table 4.1 designate the numbers of activists that showed significant scores under each brokerage type, columns 3 and 6 indicate the percentage of these numbers of activists in their respective networks in order to compare them.

Table 4.1. Activists who Score More than Expected in a Random Network in the Brokerage Types During Both Time Periods

Phase 1 January 30, 2011–February 11, 2011			Phase 2 November 27, 2014–December 9, 2014		
Brokerage Type	Number of activists who showed significant scores under each brokerage type	Percentage (%) of activists who showed significant scores under each brokerage type*	Brokerage Type	Number of activists who showed significant scores under each brokerage type	Percentage (%) of activists who showed significant scores under each brokerage type*
Coordinator	11	20.75	Coordinator	25	22.32
GateKeeper	14	26.42	GateKeeper	15	13.39
Representative	18	33.96	Representative	21	18.75
Consultant	11	20.75	Consultant	10	8.93

Liaison	8	15.09	Liaison	7	6.25

 * out of a 53 nodes network
** out of a 112 nodes network

The coordinator broker type was more prevalent during the later period (22.32% compared to 20.75%) while the liaison broker type was more prevalent during the earlier period (15.09% compared to 6.25%). These findings that liaison brokerage, which connects three different ideological groups, is more prevalent during periods of solidarity support hypothesis one. Similarly, coordinator brokers connecting within groups are more common during periods of schism.

Does Online Brokerage Reflect On-the-Ground Brokerage?

The second part of analysis tests whether brokers who occupy strategic positions in online networks correspond to the on-the-ground brokers. This is done through testing the various definitions of brokerage laid out in hypotheses 2A through 2D.

Activists-brokers who span structural holes (effective size and reinforced structural holes).

A social network metric of non-redundancy is the effective size score. A node with high effective size score is a broker who spans a structural hole, has less redundancy in his or her network and can have access to more novel information through non-redundant connections (Burt 1992). Out of the six activists who ranked high in the effective size score in the Twitter network for the later period of the revolution (Figure 4.2), only one can be considered an on-the-ground broker. He is a leader in the April 6 Youth Movement and a member of the Coalition of the Youth of the Revolution.

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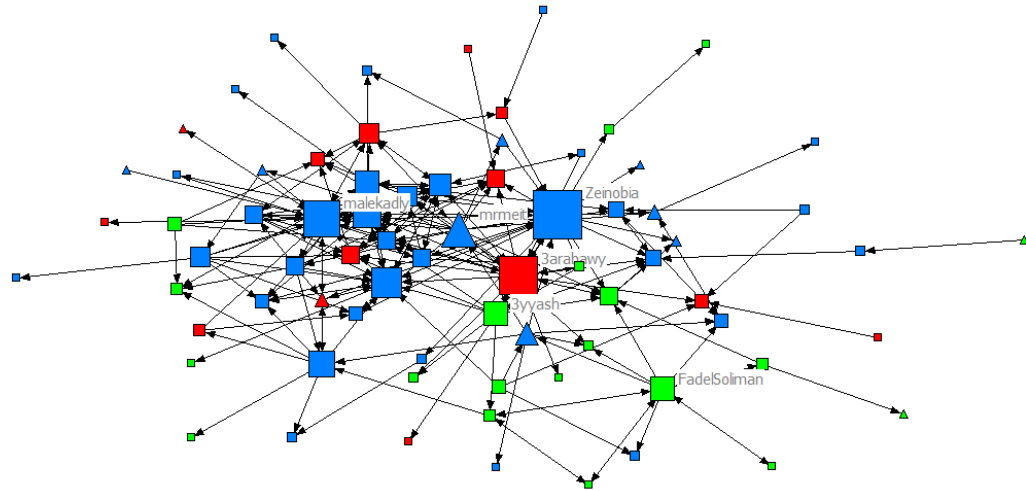
Figure 4.2. Effective size scores of the follows-mentions network. Nodes are colored based on ideology: blue indicates liberals, green Islamists, and red socialists. Nodes are sized according to effective size scores. Triangles are members of the Coalition of the Youth of the Revolution while the squares are non-members.

Activists who span reinforced structural holes have stronger brokerage positions, as they connect people who are not only isolated but also belong to isolated groups (Burt 2015). Findings show that the activists who bridged many reinforced structural holes were celebrity activists whose Twitter followers include people from all backgrounds: Wael Kandil (a journalist activist), Gameela Ismail (an activist TV host), and Khaled Abo ElNaga (an activist movie actor). Twitter accounts of social movement groups such as the Revolutionary Socialists (@RevSocMe) also ranked high on the reinforced structural hole measure. This suggests that celebrity accounts connect not only scattered people but also scattered groups of people from various backgrounds.

Most brokers who span regular structural holes were bloggers and citizen journalists while brokers who could span reinforced structural holes were mostly celebrities. Both categories almost included no members of the Coalition of the Youth of the Revolution; online brokers spanning the different types of structural holes did not mirror on-the-ground brokers.

Activists-brokers who appear on the shortest paths between others in the network (betweenness centrality).

Most communications in the network pass through activists who appear on the shortest paths between all other activists. Calculating the betweenness centralities in the follows-mentions network shows that the activists who scored high on this measure are not necessarily members of the Coalition of the Youth of the Revolution. Out of the top ten ranking activists in betweenness centrality (table 4.2), only the last (@mrmeit, a leader in the April 6 Youth Movement) is also, as a member of the Coalition of the Youth of the Revolution, an on-the-ground broker.

Table 4.2. Betweenness Centrality of the Top Ten Ranking Activists

Activist Twitter handle	Freeman Betweenness Centrality	Normalized Betweenness Centrality
@Zeinobia	898.37	6.734
@malekadly	518.07	3.884
@FadelSoliman	366.47	2.747
@3arabawy	362.57	2.718
@3yyash	344.95	2.586
@SamhyMostafa	297.08	2.227
@zelaky	293.29	2.199

@TheBigPharaoh	281.54	2.110
@waelabbas	254.72	1.909
@mrmeit*	226.08	1.695

* Member of The Coalition of the Youth of the Revolution

Overall betweenness network centralization is 6.45%, suggesting that betweenness

centrality is not concentrated into the hands of few activists.
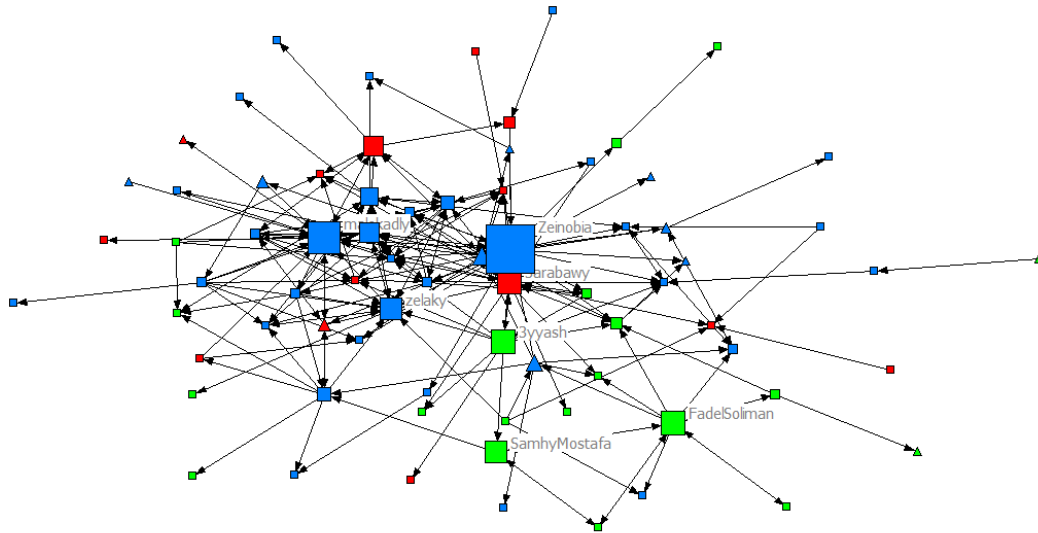
Figure 4.3. Betweenness centrality of the follows-mentions network. Nodes are colored based on ideology: blue indicates liberals, green Islamists, and red socialists. Nodes are sized according to normalized betweenness scores. Triangles are members of the Coalition of the Youth of the Revolution while the squares are non-members.

Figure 4.3 shows that the big-sized nodes (activists with high betweenness) are not

necessarily members of the Coalition of the Youth of the Revolution (presented by the

triangle-shaped nodes). There is also no specific ideology that correlates with high

betweenness.

Roles of brokers in the follows-mentions network.

The above results revealed which activists occupied strategic positions that could bring the network together during a period of revolutionary schism. These positions were identified based on occupying locations on the shortest paths between other activists or bridging a structural hole in the online network. This section looks at the characteristics of the activists who played various types of brokerage roles within and between the different ideological groups, following the Gould and Fernandez (1989) categorization mentioned above. Out of the five-type categorization, the most relevant for the purpose of this research is the coordinator broker and the liaison broker. While the coordinator type is a broker within his own group, the liaison broker connects the different ideologies. The purpose of this section is to test whether the latter type of broker corresponds to on-the-ground brokers who entered into coalitions composed of different ideological backgrounds.

As mentioned in the methods section, activists are identified through their relative brokerage scores. A relative score that is greater than one means that this type of brokerage role is practiced more than expected for this network, given group sizes (e.g. a relative brokerage score of four means the activist played this brokerage role 4 times more than expected in a similar network with random connections).

Findings show that only 3.5% (two activists out of 57 brokers) played the liaison broker role more than chance would predict in this type of network, while 38.6% (22 activists out of 57 brokers) played the role of a coordinator broker within their own groups. These results show that most brokerage in the follows-mentions Twitter network

during the latter period of the revolution was within groups rather than between groups.

The relative brokerage scores reached more than six for many activists belonging to the

coordinator type meaning that these activists played a coordinator broker type almost 6

times more than expected in a network where the ties are assigned at random. On the

other hand, the relative brokerage scores of the two activists who showed as liaison

brokers were about two, indicating that they played this role only two times as often as

they would in a network of random connections.

   One activist, @3arabawy, acted as a liaison, a consultant, and a gatekeeper; his

brokerage connected ideological groups different from his own. @3arabawy is the

Twitter handle for Hosam AlHamalawi, a socialist Egyptian independent journalist and

one of the bloggers who started the online movement many years before the revolution in

the mid 2000s.
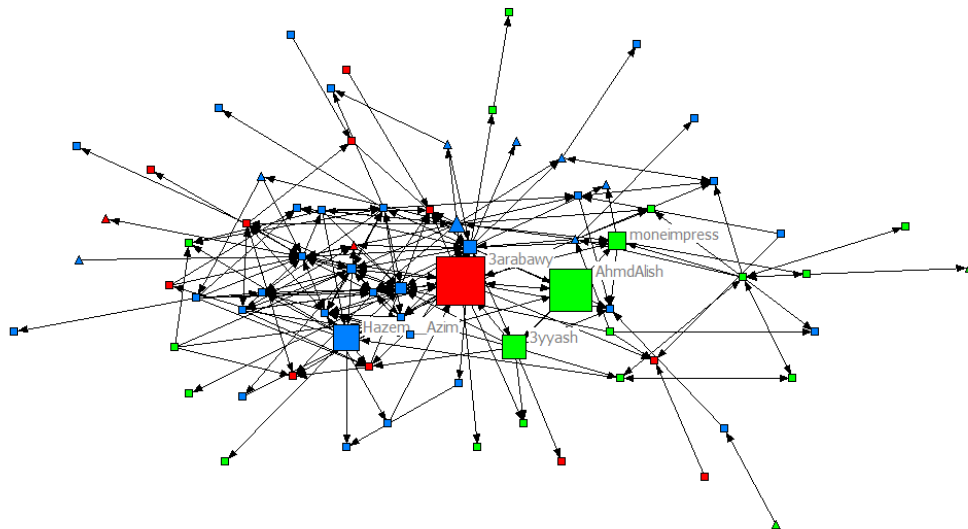
Figure 4.4. Liaison brokerage roles of the follows-mentions Twitter network. Nodes are colored based on ideology: blue indicates liberals, green Islamists, and red socialists. Nodes are sized according to liaison brokerage score. Groups are partitioned based on ideology. Triangles are members of the Coalition of the Youth of the Revolution while the squares are non-members.

Findings also show that activists who played the liaison brokerage roles are not necessarily members of the Coalition of the Youth of the Revolution. In figure 4.4, large nodes representing a liaison broker do not correspond to triangle shaped nodes representing a member of the Coalition of The Youth of the Revolution. Hypothesis 2C is not supported. Ideology also did not relate to the brokerage role played in the network. Bloggers, especially those who took up online activism through their blogs long before the revolution, connected online networks more than anyone else.

Activist-brokers whose removal disrupts the network.

Hypothesis 2D suggests that on-the-ground brokers would also be activists whose removal would fragment or affect the flow of online information. The KeyPlayer software (Borgatti 2003) identifies the activists whose removal will fragment or affect the flow of information in the online network.

Activists whose removal fragments the network.

The first type of KeyPlayer is an activist whose removal adds to network fragmentation score. The fragmentation measure varies from 0 to 1 and takes into consideration the relative cohesion of the components (Borgatti 2006). The removal of a set of 10 key players raises the overall fragmentation of the network from 0.602 to 0.940. The results show that out of these 10 key players whose removal would add to network fragmentation, only one is a member of the Coalition of the Youth of the Revolution and hence is an on-the-ground broker (Figure 4.5).
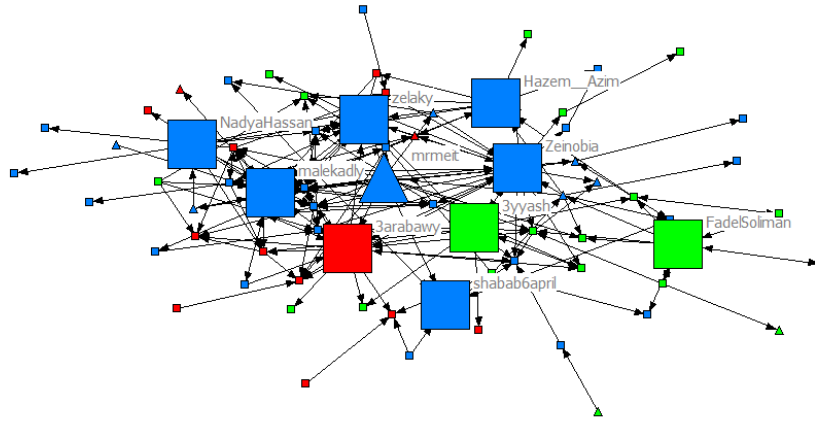
Figure 4.5. Key players in the follows-mentions network (Fragmentation Algorithm). Nodes are colored based on ideology: blue indicates liberals, green Islamists, and red socialists. Triangles are members of the Coalition of the Youth of the Revolution while the squares are non-members. Large-sized nodes indicate key players whose removal adds to network fragmentation.

Activists who affect diffusion within the network.

The second type of KeyPlayer is an activist who can reach a large percentage of

distinct nodes within the network. The removal of such activist disrupts diffusion of

information within the Twitter network. Findings show that out of the 10 key players who

could reach up to 56.4% of the Twitter network, only one activist was a member of the

Coalition of the Youth of the Revolution and hence an on-the-ground broker (Figure 4.6).
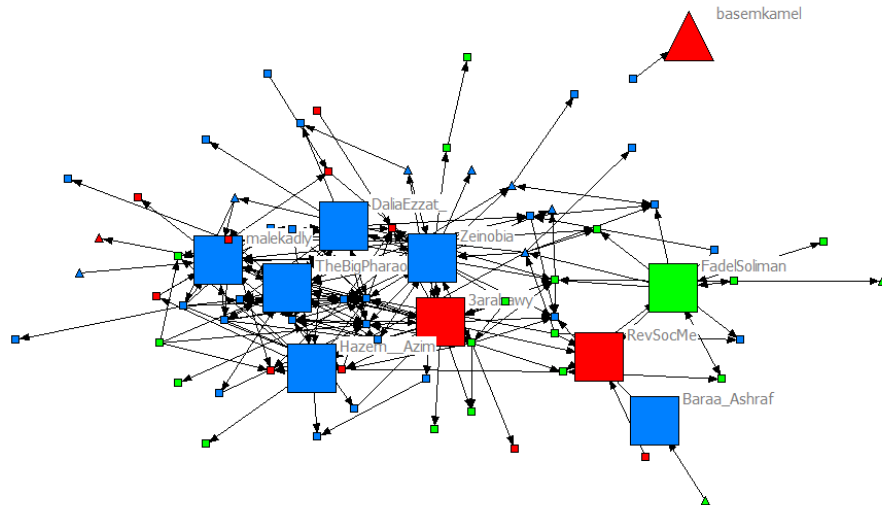
Figure 4.6: Key players in the follows-mentions network (Reach Algorithm). Nodes are colored based on ideology: blue indicates liberals, green Islamists, and red socialists. Triangles are members of the Coalition of the Youth of the Revolution while the squares are non-members. Large-sized nodes indicate key players who can reach 56.4% of distinct nodes in the network.

Out of the five key players that both methods identify—the set of activists whose removal would increase network fragmentation and who can reach out to distinct nodes in the network—none was a member of the Coalition of the Youth of the Revolution. The analysis does not support hypothesis 2D; the activists whose removal would disrupt the online network were not the same as on-the-ground brokers.

The above findings show that activists who scored high on the measures of online brokerage identified by social networks theory do not correspond to the ones who played brokerage roles on the ground, operationalized through being members of the Coalition of the Youth of the Revolution. Out of the six who scored high in more than one measure of online brokerage, only one (Mohamed Adel @mrmeit), a leader in the April 6 Youth

Movement, was a member of the Coalition of the Youth of the Revolution and hence an

on-the-ground broker (table 4.3). He scored high in two of these measures.

These results suggest that Twitter networks do not necessarily mirror offline networks in

terms of brokerage.

Table 4.3: Activists who Rank High in More than One Brokerage Measure in the Network

Activist Twitter handle	Activist ranked high on spanning structural holes	Activist ranked high on being on the shortest paths between all other activists	Activist ranked high in reaching out to a large number of activists and whose removal would add to network fragmentation	Activist ranked high on being a liaison broker connecting different ideologies
@3arabawy	✔	✔	✔	✔
@Zeinobia	✔	✔	✔	
@malekadly	✔	✔	✔	
@FadelSoliman	✔	✔	✔	
@3yyash	✔	✔		
@mrmeit*	✔	✔		

* Member of the Coalition of the Youth of the Revolution.

DISCUSSION AND CONCLUSION

Supporting social movements theory of coalition building on the prevalence of

bridge builders at times of movement solidarity, this chapter confirms that the online

brokers who connected different ideological groups were more prevalent during the early

period of the Egyptian revolution, characterized by solidarity. Similarly, within-group

brokerage was more prevalent during the later time period characterized by schism.

Social movements theory of networks that explain on-the-ground contexts can also explain online networks.

While this finding could support the argument that online activism mirrors on-the-ground mobilization, analysis of the network of activists who both follow and mention each other during the later period of the revolution, when fragmentation plagued the movement, shows that activists who occupied strategic locations of brokerage online were not necessarily on-the-ground brokers. Activists who spanned structural holes in the online network, who were on the shortest paths among all other activists, who connect across ideological groups rather than within groups, or whose removal would disrupt the flow of information within the network, did not correspond to on-the-ground brokers, at least in that they were not likely to be members of the Coalition of the Youth of the Revolution.

Findings also show that the activists who bonded the network together were mainly the early bloggers and citizen journalists who started online activism in the mid 2000s, long before the revolution. They do not belong to a specific ideology. Looking at the activists who ranked high in more than one measure of online brokerage (table 4.3), @3arabawy is Hossam AlHamalawy, a socialist Egyptian activist blogger and independent journalist who has a blog with the same name as his Twitter handle.[14] @Zeinobia is another liberal blogger citizen journalist who started her blog "Egyptian Chronicles"[15] in 2004—about the same time many other bloggers and new movements calling for an end to President Mubarak's rule were rising in Egypt. @3yyash, AbdelRahman Ayaash, an Islamist, is the editor in chief of NoonPost,[16] an independent

online news site. While the research addresses the follows-mentions network of a set of activists, the findings support previous research on the Retweet networks, following specific hashtags from Egypt and Tunisia (Lotan et al. 2011). Those studies concluded that journalists, activists, and bloggers were the main sources of diffusion of news on Twitter during the uprisings of the Arab Spring. This chapter shows that they also play the role of brokers within their smaller scale network of activists.

Another category of actors who helped bring online networks together is the group of celebrity activists. Their accounts on Twitter play an important role in connecting the disconnected parts of the network and bringing novel information to their many followers from different ideological streams. The way Twitter is structured makes these accounts brokerage hubs where followers get to know each other. These findings complement findings of previous studies, which concluded that Twitter is an assembling site where people convene around a particular topic or a hashtag that acts as a broker between groups (Lotan et al. 2011; Bruns, Highdield, and Burgess 2013).

While the findings above provide evidence that Twitter online networks of the activists of the Egyptian revolution do not reflect on-the-ground networks in terms of brokerage, they do suggest that the two realms complement each other rather than having no relationship. While citizen journalists and bloggers play the role of online brokers who connect scattered people looking for sources of online news, on-the-ground brokers bring different ideological backgrounds into revolutionary coalitions. On-the-ground brokers are more affiliated with de facto social movements and collectivities while online brokers are generally independent individual activists with no organizational affiliations. Online

(especially Twitter) activism is a source of news that grabs the attention of dispersed people to the movement. When activism takes to the streets, on the ground coordination becomes the task of activists who are mainly affiliated with organizational groups.

The research presented here informs research on digital activism through giving new insights into the role of brokers in online networks of social movements and the leverage these networks can offer through creating new repertoires of activism. Further research should track the evolution of the networks of these activists over time and measure whether the brokerage roles they played in the period studied here brought people together later on. Chapter five attempts to study the networks over time. Qualitative research examining the content of the tweets would also illuminate the networks the brokers facilitate and their purpose.

In conclusion, adding validity to the application of social movement theory to online networks, this chapter shows that online brokers who connect different ideological backgrounds are more prevalent during times of solidarity than times of schism. Nevertheless, they do not necessarily reflect on the ground brokers. While activists who enter on the ground coalitions bond the movement offline, bloggers, citizen journalists, and celebrities bond it online. Digital activism offers new types of brokerage roles and repertoires of activism that differ from on the ground repertoires of brokerage. The two repertoires complement rather than reflect each other. This chapter looked at the presence of bridge builders as one factor of coalition building. The following chapter five investigates the third factor of coalition building studied in this dissertation, the presence of previous ties.

Chapter 5

Evolution of the Twitter Networks of the Egyptian Revolution

Chapter three of this dissertation discussed the Twitter online networks of

Egyptian activists at two distinct time periods. It supported the social movements theory

of coalition building as an explanation of the role of ideological congruence during

periods of solidarity and schism. Twitter networks of Egyptian activists reflected on-the-

ground solidarity and ideological diversity during the early phase of the revolution and

fragmentation and ideological polarization during the later period. This analysis did not

address the causes or dynamics of polarization, a subject this chapter takes up. This

chapter differentiates the patterns of networking between the "early-joiners" and the

"late-joiners" to explain the patterns in each of the two periods. The early-joiners joined

Twitter by 2007; most retained their Twitter accounts through the second time period.

Late-joiners joined Twitter after 2011 and thus were not part of the revolution's Twitter

activity during the first time period.

Based on the distinction between the early-joiners and the late-joiners, this chapter

seeks to answer several research questions about the behavior of the Islamists, liberals,

and socialists who formed a single cohesive network in the early period. First, did the

early-joiners keep the ties they had built in the early period, or did the fragmentation that

ensued dissolve those ties? How did the presence of previous ties among the early-joiners

predict their ties during the second time period? Were the late-joiners able to form

coalitions across ideology as the early-joiners had, or were they more polarized across ideological lines, hence adding to network polarization and schism?

After studying ideological congruence and the presence of bridge builders as factors of coalition building in chapters three and four respectively, this chapter tests the application to online networks of the third factor advanced by social movements theory of coalition building. This factor is the presence of previous ties among the activists, which the theory states would promote future solidarity. Yet, chapter three shows that fragmentation followed solidarity in this particular network. To determine why, I look at the interplay of other factors that might have hindered movement solidarity, and thereby determine the driving force behind the later schism among Twitter users.

This analysis contained in this chapter proceeds as follows. First I look at the impact of the late-joiners on network cohesion to test whether these activists contribute to the network fragmentation that occurred in the later period. Second I test the relationship between a user's ties in the early period to his or her ties in the later period. Third, I look at the introduction of the late-joiners and the patterns of ideological homophily they added to the network, thereby mitigating the cohesion and diversity the continuity of previous ties among the early-joiners caused.

The findings of this chapter provide evidence that online Twitter networks are similar to on-the-ground networks and follow the rules of social movements theory of coalition building in that previous ties govern the presence of ties at a later stage. Nevertheless, the reason for the later period of schism is not that previous solidarity had no correlation with later ties but that the late-joiners increased the network's

fragmentation. The ideological congruence of these late-joiners was determinative in the later time period.

THEORY AND BACKGROUND LITERATURE

The social movements theory of coalition building suggests that previous ties among activists and organizations can maintain coalitions and create solidarity in movements. It also acknowledges that ideological differences inhibit alliances. Research has not addressed the effect of the interaction of those two opposing factors on movement cohesion to date. The current study enters this gap by studying the impact of the introduction of new activists on a movement that is growing over time. Through analysis of whether the early activists maintain the ties they built in the early period and the impact of the ideological patterns of the late-joiners on network cohesion at a later stage, we can analyze the interaction of the preservation of previous ties and ideology on network cohesion. In this chapter, I build on the social movements literature to examine the impact of the introduction of new activists. I do this by examining the role of previous ties and of ideological congruence as factors in coalition building.

Impact of the Introduction of Late-joiners In Social Movements that Evolve Over Time

Scholars of social movements have shown that the evolution of activist networks over time explains levels of social movement participation (Tindall 2002, 2004). Further, the formation of ties reveals continuity and shifts in network structures and campaign claims over time (Diani 2011:352; Diani and Kousis 2014).

When movement networks evolve over time, they can spur the addition of new actors that have an impact on network structures and the movement at large. Coalition dissolution, for example, can open up opportunities for actors who were not involved in the dissolved coalitions to play brokerage roles in the movement (Heaney and Rojas 2008). Similarly, the introduction of new actors into network structures can help advance social movements and bring movement cohesion, as occurred in the rise of the Polish Solidarity Movement (Osa 2003). Cliques and brokers and network expansion were key in sustaining the movement in its emerging phase and in protecting the network against policing.

Studying the evolution of networks over time can also help explain whether the presence of newcomers mitigates the effect of other factors at play in the network before they joined. For the specific purposes of this research, studying the evolution of networks over time helps analyze the impact of the late-joiners on increasing network cohesion or fragmentation and, hence, their effect on enhancing or attenuating previous alliances.

Evidence and theories about the impact of late-joiners on movements lead to the following hypothesis:

Hypothesis 1: Fragmentation of the Twitter network of Egyptian activists during the later period of the revolution, in 2014, increased because of the presence of late-joiners.

The Impact of Previous Ties on Coalition Building

The social movements literature of coalition building has emphasized the role pre-existing ties play in both coalition building and dissolution (Shumate, Fulk, and Monge

2005; Corrigal-Brown and Meyer 2010; Heaney and Rojas 2008). Studies have found that common organizational interests and framing are necessary but not sufficient factors to support coalition building. Pre-existing social ties are also important factors in determining the success of future coalitions. Organizations with previous ties are more likely to build coalitions due to their mutual trust and ability to build consensus over goals and tactics (Corrigal-Brown and Meyer 2010; Levi and Murphy 2006). Hence the structure of the network at a given point in time can predict its future structure.

One of the goals of this dissertation is to test the application of the theory of coalition building to online networks, which helps explain the evolution of networks over time. It specifically tests the stability of the network of the early-joiners over time based on the presence of previous ties among them. The literature suggests that, just as ties endure in offline networks, they will do so in online networks.

Hypothesis 2: The presence of ties among the activists who were on Twitter in the 2011 period predicts the presence of ties among them in 2014.

The Influence of Ideological Congruence on Coalition Building

While previous ties can facilitate the continuity of coalitions over time, other factors may intervene and affect this solidarity. The social movements theory of coalitions states that ideological congruence, homophily, and cultural similarities are important factors in coalition building (Cornfield and McCammon 2010; McCammon and Campbell 2002; Lichterman 1995; Gerhards and Rucht 1992). Coalitions among organizations can happen only when they hold a vision or policy agenda that is sufficiently ideologically similar to support ongoing partnering. To overcome ideological

differences, organizations create common master frames to support alliance building (Obach 2004). This strategy has proven particularly effective under authoritarian regimes (Mische 1995; 2003). Similarly, ideological differences obstruct coalition building even for groups that share the same goals (Roth 2010; Guenther 2010). In such cases brokerage may be able to make different ideological groups converge; without it ideological homophily increases in their networks, leading to network polarization (Staggenborg 1986; also see chapter four).

Several studies have addressed the effect of ideological congruence in bringing people who share ideology together and preventing network polarization in online networks. Pavan (2014) states that online communication tools help bind activists who feel they share the same collective identity together. Similarly, political bloggers or politicians are more likely to link to people who share their political views than their ideological opponents (Hargittai, Gallo, and Kane 2008; Kelly, Fisher, and Smith 2005; Adamic and Glance 2005). Using semantic network analysis and studying topological structures of Twitter networks shows that Twitter communities cluster into groups based on identity. They practice communication accommodation and convergence and are characterized by cultural homophily (Tamburrini et al. 2015; Bryden, Funk, and Jansen 2013). Some online social media platforms have functions that can intensify polarization. For example, polarization among Twitter communities can increase through "Retweets" because they usually indicate endorsement of a particular ideology; this can lead to homophily between socially similar individuals at the expense of others. Twitter

"Replies" can either reinforce group identity or add to group schism, depending on whether the two people who communicate share an ideology (Yardi and Boyd 2010).

This chapter tests the dynamics behind the polarization that occurred during the latter phase of the Egyptian revolution by testing the applicability of existing theories about the role of ideological congruence in coalition building. To do this, I test for ideological congruence among the late-joiners. If they exhibited such congruence, they may have caused, in whole or in part, polarization and schism in the later period when the presence of ties among the early-joiners might otherwise have predicted a continuation of the solidarity of the early period. This leads to testing the third hypothesis, which relates to ideological congruence:

Hypothesis 3: Ideological homophily characterizes the Twitter network of the members who joined after 2011. Whereas early-joiners had ties that spanned ideology, late-joiners tend to connect with people who share their ideology.

DATA AND METHODS

Networks Classification

As in all of this dissertation, I use the dataset of Twitter mentions networks described in chapter two for the current chapter. However, in this chapter, I re-classify the mentions networks. To test hypotheses 1–3 and isolate the effect of each group of activists, I divide the sample of Twitter users into three groups. This results into three new Twitter mentions networks:

1- The "early-joiners 2011 network." These activists possessed Twitter accounts in 2011 and maintained them through 2014. Out of 53 users present in the overall mentions network in 2011, two users closed their accounts by 2014. This network consists of 51 nodes, and characterizes their connections in the earlier period.

2- The "early-joiners 2014 network." This network consists of the same users as the early-joiners 2011 network, so of course it consists of the same 51 nodes, but characterizes their connections in the later period.

3- The "late-joiners 2014 network." These users participated in the Twitter mentions network in 2014 but are absent from it in 2011. This network is composed of 61 nodes.

The three networks are similar in size, which makes them comparable.

Methods to Study the Dynamics behind Network Fragmentation

The first research goal of this chapter is to understand the dynamics behind the turn from solidarity to fragmentation by looking at the behavior of the early-joiners during both time periods and the effect of the introduction of the late-joiners to the network. To test hypothesis 1 that late-joiners increased network fragmentation, I compare cohesion measures of the three networks (the early-joiners during both time periods and the late-joiners) to determine which group adds to network fragmentation. Cohesion measures include the density of the network, the average weighted degree—because the networks are of different sizes—the fragmentation index, and the component ratio. The first two measures determine network cohesion while the latter two determine network fragmentation.

I follow the analysis of the basic cohesion metrics with clique analysis to determine how cliquish each network is and hence determine its level of fragmentation. A clique is a maximal group of users of at least three that each mentions the other during the time period (Borgatti, Everett, and Johnson 2013:183). The bigger the cliques are in the network, the more cohesive and less fragmented it is.

Methods to Study Effect of Previous Ties in Twitter Networks

The second research goal of this chapter is to test whether, in line with the social movements theory of coalition building, the presence of ties during a later period correlates with the presence of previous ties at an earlier period (hypothesis 2). I use a Multiple Regression Quadratic Assignment Procedure (MRQAP) of the mentions network of the early-joiners during the 2014 period on their mentions network during the 2011 period. Being of the same ideology was added to the model as a control variable. MRQAP is a regression technique that suits the research question because it reflects the dependency of the cases (Borgatti, Everett, and Johnson 2013:126-133).

Another test is done on the meso-level of the different groups. I compare the ties within and between the groups, the early-joiners and the late-joiners, to decide whether the early-joiners tend to connect to each other more during the second time period or if they connect to the late-joiners. The method compares how the distribution of observed ties within and between two groups differs from what we would expect if ties were distributed at random across all pairs of nodes. If there are significantly more observed ties than random assignment would provide within a specific group, the members of the group have more in-group than out-group ties (Hanneman and Riddle 2005: chapter 18).

If the early-joiners tend to connect to each other more than they connect to the late-joiners, this suggests that the presence of previous ties made this group more coherent. The method of analysis on the meso-level highlights the dynamics of networking within and between the early-joiners and the late-joiners, hence adding to our understanding of which group augmented network fragmentation.

Methods of Studying Homophily Effects within the Networks

The preservation of previous ties is just one factor of coalition building that can lead to movement solidarity. Ideological homophily can also lead to polarization if it results in groups of the same ideological affiliation mentioning each other more than they mention groups from other ideologies. The third research goal of this chapter is to test the effect of ideological homophily in increasing network polarization during the second time period after the late-joiners were added to the network (hypothesis 3). I conducted homophily tests on the macro-level of the whole network and the meso-level of the different ideological groups in the network.

To study the macro-level, I conduct Quadratic Assignment procedures (QAP) for each of the three networks: the early-joiners 2011, the early-joiners 2014, and the late-joiners 2014. For each regression, the mentions network was the dependent variable while the network of being of the same ideology was the independent variable.

On the meso-level, I conducted homophily analysis on a group level to test the significance of ties within the ideological groups, compared to networks that hold the same features but have the ties assigned at random, and to determine which ideological group is more homophilous. My aim is to detect which group is the reason why the

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overall network turned to be more homophilous during the later period. Constant-homophily analysis of variance (ANOVA) followed by variable-homophily ANOVA supplies the test. Constant-homophily ANOVA assumes that all the ideological groups have equal tendencies to connect to members who share their ideology and tests whether members have a predilection towards in-group ties. Variable-homophily ANOVA identifies the most homophilous ideological group by distinct patterns of within-group ties, based on the assumption that the ideological groups have variable homophily levels (Hanneman and Riddle 2005: chapter 18).

FINDINGS

Dynamics of Network Fragmentation

Showing an analysis of basic network cohesion measures for the three networks (the early-joiners 2011, the early-joiners 2014, and the late-joiners 2014), table 5.1 reveals that the early-joiners 2011 network was the most dense (highest average weighted degree) and the least fragmented (lowest fragmentation index). While the early-joiners network was more fragmented in 2014 than it had been in 2011 (shown by the measures of the early-joiners 2014 in table 5.1), the introduction of the late-joiners to the network had more influence on the overall network fragmentation of the later phase than the early-joiners had (expressed by the lowest average weighted degree and the highest fragmentation index of the late-joiners 2014 in table 5.1). As the number of components and component ratio reflect, the late-joining activists my process identified also included more isolates than the early-joiner group in either period.

Table 5.1. Cohesion Measures of the Networks of the Early-Joiners and the Late-Joiners

Network Measure	Early-Joiners 2011	Early-Joiners 2014	Late-Joiners 2014
Average Weighted Degree	5.961	2.333	.574
Density	.119	.047	.010
Number of Components	24	31	56
Component Ratio	.460	.600	.917
Fragmentation	.516	.706	.978

Clique analysis, which shows groups of people where all the members mention each other, also confirms the results of the cohesion analysis. Figure 5.1a shows the highly dense cliques among the early-joiners during the first time period. There were 49 cliques of minimum size 3, and the biggest cliques included 11 members. The early-joiner 2014 network had fewer, less dense cliques in the second time period (Figure 5.1b). The number of cliques between early-joiners in 2014 was 34, and the largest cliques were less than half as big with 5 members. These results indicate the network of the early-joiners fragmented between the first and the second time period.

(a)   (b)
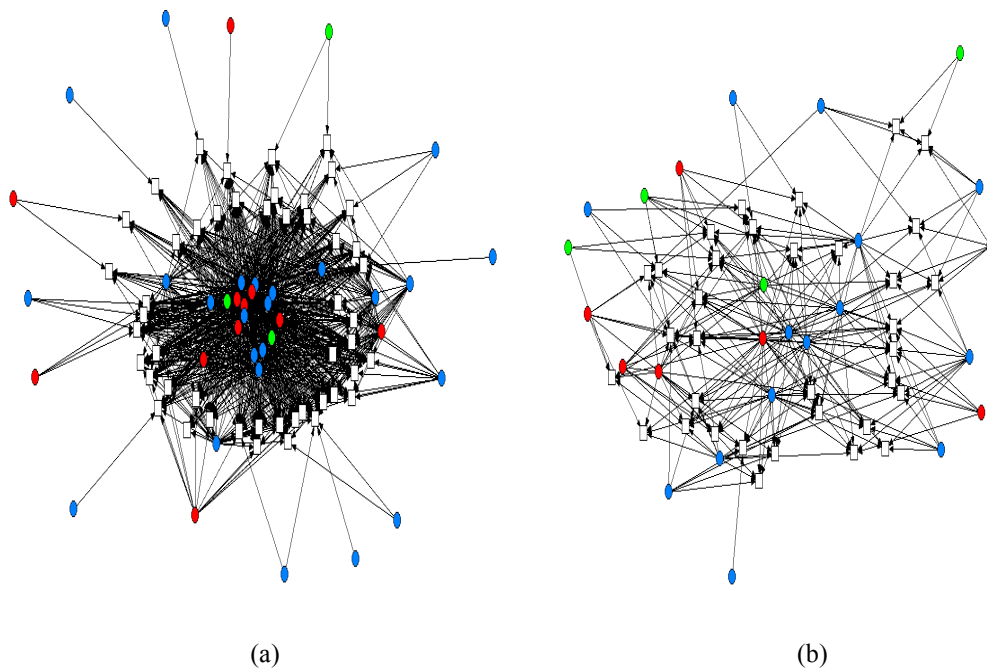
Figure 5.1. Twitter clique participation networks for the early-joiners in (a) 2011, and (b) 2014. Isolate nodes are not shown. Ties (member participation in the clique) are filtered at .5, showing only activists who connect to at least half of the members of a clique. Nodes are colored based on ideology. Blue: Liberals; Green: Islamists; Red: Socialists. White squares are cliques.

A more significant fragmentation appears in the network of the late-joiners. There were only 5 cliques among the 61 members. None of these cliques exceeded 3 members (Figure 5.1c). These results suggest that the late-joiners did not enter the network a group, which would have dense cliques, but rather that it was more fragmented than even the early-joiner 2014 group. I find support for hypothesis one; latecomer activists significantly added to the fragmentation of the online networks of activists of the Egyptian revolution.
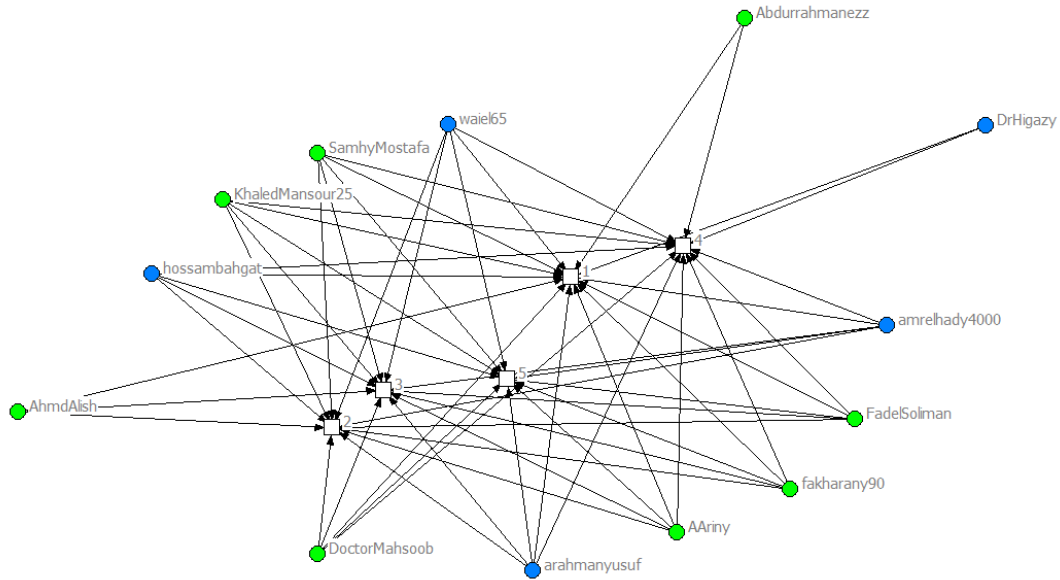
Figure 5.1c. Twitter clique participation networks for the late-joiners in 2014. Isolate nodes are not shown. Ties are not filtered indicating that each node shown is a full member of the corresponding clique. Nodes are colored based on ideology. Blue: Liberals; Green: Islamists. White squares are cliques.

Effect of Previous Ties in Twitter Networks

The above findings show that the network was a more fragmented one during the second time period and this fragmentation was mainly due that the late-joiners were fragmented. Likewise the early-joiners became more fragmented during the second time period than they had been in the first.

Results of the MRQAP analysis of the early-joiners 2014 network on the early-joiners 2011 network (table 5.2) show that, controlling for activists who share ideology, the presence of previous ties significantly increases the probability of the presence of ties at the later period. These results suggest that the social movements theory of coalition building on the role of previous ties in preserving coalitions also apply to Twitter networks.

Table 5.2. MRQAP of the Effect of Presence of Previous Ties in the Twitter Mentions Network of the 2011 Early-Joiners Network on the 2014 Early-Joiners Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Previous Ties	.009	.054 (.003)	.021*	.021	.980
Same Ideology	.030	.011 (.077)	.337	.337	.663
Intercept	.132	.000 (.000)	.000	.000	.000

Note: Numbers in parentheses are standard errors
* p< 0.05, ** p<0.01, *** p<0.001

The meso-level of analysis of the pattern of mentioning within and between the two groups (the early-joiners and the late-joiners) also shows the influence of previous ties. Table 5.3 compares the observed ties within and between each group to the ties they would have if the ties were assigned at random. Findings show a far higher rate of ties within the early-joiners during the later time period compared to what random assignment would predict, but not between the early-joiners and the late-joiners or in the late-joiner network.

Table 5.3. Comparison of Ties within the Early-Joiners and between the Early-Joiners and the Late-Joiners During the Late Time Period in 2014

	Expected ties in a network assigned ties at random	Observed ties	Difference (observed – expected)	P>= Difference	P<= Difference
Ties within early-joiners	48.612	96.000	47.388	.002**	.999
Ties between early-joiners and late-joiners	118.614	112.000	-6.614	.834	.200
Ties within late-joiners	69.773	29.000	-40.773	.998	.003**

* p< 0.05, ** p<0.01, *** p<0.001

Results of table 5.3 confirm the MRQAP results, which show that the early-joiners mention each other in the later phase of the revolution more than they mention the late-

joiners. The findings support hypothesis 2; the presence of ties among the activists who were on Twitter during the early time period of the revolution predicts the presence of ties among them during the later period. The presence of previous ties in Twitter networks tends to create ties at a later time, as on-the-ground coalitions manifest.

Homophily Effects within the Networks

According to the social movements literature, the correlation between early ties and later ties that my findings reveal should create a coherent and united movement. Findings in chapter three and in table 5.1 show that the later period was fragmented, ideologically homophilous, and polarized. To understand why the ties of 2011 did not assure a united movement in 2014, I will look at the impact of homophily patterns of the late-joiners on the network. I do this by looking at the difference in homophily patterns of the early-joiners and the late-joiners at the macro level (the whole network level) and at the meso level (among different ideological groups).

Homophily analysis at the macro level.

To study the effect of ideological homophily on whether the activists mention each other, I conduct a Quadratic Assignment Procedure (QAP) analysis of the activists who share the same ideology within the early-joiner 2011 network (table 5.4a), the early-joiner 2014 network (table 5.4b) and the late-joiner 2014 network (table 5.4c).

Table 5.4a. QAP of the Effect of Ideology on Mentions within the Early-Joiner 2011 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Same Ideology	.667	.036 (.539)	.123	.123	.877
Intercept	.712	.000 (.000)	.000	.000	.000

Note: Numbers in parentheses are standard errors

Table 5.4a shows that sharing an ideology did not determine mentions among the early-joiners during the early phase of the revolution.

Table 5.4b. QAP of the Effect of Ideology on Mentions within the Early-Joiner 2014 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Same Ideology	.036	.013 (.078)	.306	.306	.695
Intercept	.139	.000 (.000)	.000	.000	.000

Note: Numbers in parentheses are standard errors

Similarly, table 5.4b shows that sharing the same ideology did not affect mentioning in 2014 for early-joiners.

Table 5.4c. QAP of the Effect of Ideology on Mentions within the Late-Joiner 2014 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Same Ideology	.033	.058 (.012)	.011*	.011	.989
Intercept	.009	.000 (.000)	.000	.000	.000

Note: Numbers in parentheses are standard errors
* p< 0.05, ** p<0.01, *** p<0.001

Unlike the tables 5.4a and 5.4b, table 5.4c shows that ideology determines who mentions whom among late-joiners (p=.011). Given that while the early-joiners did not have ideological homophily even in the later period, the late-joiners drove the ideological homophily of the overall network and, therefore, the network polarization of 2014.

Homophily analysis at the meso-level.

I conducted homophily analysis on a group level to test the homophily of the ideological groups within the three networks. The aim is to detect which ideological group drove the polarization of the network in 2014.

Table 5.5 displays the results, with tables 5.5a, b, and c testing whether the ideological groups are more likely to mention members of their own ideology for the early-joiners 2011, the early-joiners 2014, and the late-joiners 2014, respectively. These results reflect a type of ANOVA test that assumes that the three ideological groups have equal tendencies to connect to members of their own group.

Table 5.5a. Constant Homophily ANOVA in the the Early-Joiner 2011 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Intercept	.712	.000	.882	.882	.119
In-group Ties	.667	.036	.119	.119	.882

Table 5.5a shows that there is no significant difference in the patterns of networking within groups in the early period, compared to a network where the ties are assigned at random. The results affirm the fact that the early-joiners did not display ideological homophily during the early phase of the revolution.

Table 5.5b. Constant Homophily ANOVA in the Early-Joiner 2014 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Intercept	.139	.000	.691	.691	.317
In-group Ties	.036	.013	.317	.317	.691

Like table 5.5a, table 5.5b shows a lack of ideological homophily among the early-joiners, during the late phase just as during the early phase.

Table 5.5c. Constant Homophily ANOVA in the Late-Joiner 2014 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small

Intercept	.009	.000	.990	.990	.012
In-group Ties	.033	.058	.012*	.012	.990

*p< 0.05, ** p<0.01, *** p<0.001*

In contrast to the early-joiners, there is a significant difference in the patterns of networking within the ideological groups of the late-joiners, compared to a network where the ties are assigned at random (table 5.5c). Results at the meso-level of the ideological groups confirm the macro-level findings: late-joiners drove the homophily and polarization of the network as a whole during the later phase. These findings show support for hypothesis 3; ideological homophily characterizes the Twitter network of the users who joined after 2011.

Which ideological group drives the homophily of the later network?

In order to test which ideological group is the most homophilous, I conducted a variable homophily ANOVA test assuming that the ideological groups have variable homophily levels and testing which ideological group is significantly different from the others in its patterns of within-group ties. Since the early-joiners had no homophily at any stage, I conducted this test only for the late-joiners, as they showed significant difference from randomness in the pattern of ideological in-group ties, which the early-joiners never did.

Table 5.6. Variable Homophily ANOVA in the the Late-Joiner 2014 Network

	Unstandardized Coefficient	Standardized Coefficient	P-value	P as Large	P as Small
Intercept	.009	.000	.990	.990	.012
Liberals' In-group Ties	.004	.006	.319	.319	.681
Islamists In-group	.068	.093	.007**	.007	.993

Ties					
Socialists In-group Ties	-.009	-.004	.682	.319	.682

*p< 0.05, ** p<0.01, *** p<0.001*

Table 5.6 shows that for the late-joiners network, the Islamists' in-group ties were significantly different from everyone else's (p=0.007), suggesting that the Islamists are more homophilous than the groups. The probability that two Islamists mention each other is 6.8% greater than the probability that two activists, assigned ties at random, mention each other.

Supporting hypothesis 3, tables 5.5 and 5.6 suggest that the activists who joined during the later phase of the revolution were more homophilous than the early-joiners and that part of the reason for their homophily could be the homophily that existed among the Islamists during the later phase. Looking at the whole activists network during the later phase of the revolution, the structure of the clique participation matrix shows two main dense groups (Figure 5.2).
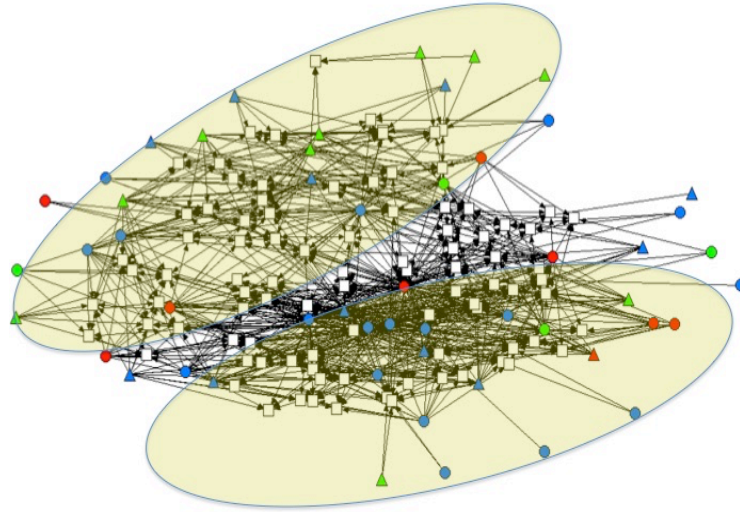
Figure 5.2. Twitter clique participation network for the late phase of the revolution in 2014. Isolate nodes are removed. Ties are filtered to .5 showing only activists who at least link to half of the members of the clique. The color of nodes indicates ideology. Blue: Liberals; Green: Islamists; Red Socialists. White squares are cliques. The shape distinguishes early-joiners (circles) from late-joiners (triangles).

The structure shows that the dense groups consist of the early-joiners, most of whom are liberals or socialists and appear at the bottom of figure 5.2, on the one hand, and the late-joiners, most of whom are Islamists and those who supported them in opposing the deposal of President Morsi, appearing at the top of the figure, on the other hand. A hierarchical clustering of the clique overlap matrix (the matrix containing the activists who share the same cliques together) confirms these findings and shows that the partition with highest modularity (Q=0.211) has 10 clusters. The two biggest clusters are: Cluster 1 : Zelaky, the Bigpharaoh, malekadly, 3arabawy, zeinobia, malek, nadyahasan, daliaezzat, demaghmak, minazekri, hossambahgat, waelabbas, basemfathy (mostly non-Islamists early-joiners).

Cluster 2: mrmeit, amrelhady, fadelsoleiman, AARiny, moneimpress, abdurahmanezz.
(mostly Islamists late-joiners).

DISCUSSION AND CONCLUSION

This research tests the interplay of two factors of coalition building in a movement that grew over time: the presence of previous ties and ideological homophily. Many activists joined Twitter after 2011, such that the 2014 activist network is much larger than the earlier network had been. The social movements theory of coalition building states that the presence of previous ties and ideological congruence will build solidarity in a movement. It also acknowledges that these two factors can act against each other, as previous ties increase solidarity, because the ties themselves persist, while excessive ties within the same ideological groups at the expense of ties across groups increases polarization. Empirical evidence shows that the online networks witnessed fragmentation and ideological polarization during the second period of the revolution compared to the first period. The analysis presented in this chapter addressed the effect of the presence of previous ties in maintaining solidarity and how the addition of new activists attenuated this effect during the second period. I examined whether the overall fragmentation in the later phase reflected the role of the early-joiners or the late-joiners, the effect of the presence of previous ties on the network of early-joiners, and the impact of the ideological congruence of the early-joiners and the late-joiners on network polarization.

Just as the analysis in chapter 3 showed, this chapter shows that the united and dense network that existed during the first phase of the revolution became more

fragmented over time. Cliques were fewer and smaller, with none greater than 5 activists, as compared with the larger cliques involving more of the activists of the earlier period. This fragmentation did reflect the fragmentation of the users who were part of the network during both time periods. But the late-joiners were even more fragmented than the early-joiners in the later phase. The late-joiners formed very few cliques, and none of those they did form exceeded three activists in conversation.

Results of regression analysis of the network of the early-joiners during the second time period on their corresponding network during the first time period affirm the social movements theory of coalition building. They show that the presence of previous ties predicted ties at the later phase. Even in 2014, the early-joiners were communicating more with those they had communicated with in 2011 than those they had not.

Analysis of ideological homophily in the network shows the profound influence of the late-joiners. On both the macro-level of the network as a whole and the meso-level of each ideological group, the late-joiners were ideologically homophilous, which the early-joiners were not in either of the time periods. Thus the presence of the late-joiners primarily drove the ideological homophily, and hence the polarization, during the later phase of the revolution. The members of the 2011 network created connections that crossed ideological barriers and maintained them, but latecomers had disrupted the coalitions by 2014. The ideological polarization of the late-joiners generated the overall network polarization.

In-depth group analysis shows that the Islamists had the greatest homophily of the three ideological groups and therefore caused the network polarization of the later period.

They were the largest group among the late-joiners, and their mentions network primarily consisted of opponents of the coup d'état that overthrew President Morsi in July 2013. Findings show that there were two main camps during the later period. The first group consisted of the late joiners who were mostly Islamists and the non-Islamists who supported them against the coup d'état such as the liberals Ayman Nour and Wael Kandil. The second group was primarily socialist and liberal early bloggers and journalists who had been in the network in 2011 as well. These findings show that the Twitter networks resembled the offline networks in Egypt in the later phase of the revolution. The finding that some secularists sided with the Islamists also supports earlier research about the point of view of secularists on the military intervention against an elected president (Borge-Holthoefer et al. 2015).

The findings of this chapter suggest some modifications to the theories of coalition building. While social movements theory on the causes of coalition building can be confirmed for one factor, the interaction of this and other factors and their effect on the overall network can have a larger impact. Early ties can drive later ties, but ideological congruence can intervene and cause movement schism. New activists who join the movement and are ideologically polarized can hinder previous solidarity and cause network polarization and movement schism. The best way to get a full picture of the formation of ties is to look at the dynamics of the formation of connections and the characteristics of the different groups that form the ties.

The findings of this chapter highlight the need for further research to study networking within movements over time. As movements grow, the early activists are no

longer the only players who determine the formation and shape of ties. New activists, who join the movement with their own ideological allegiances, can disrupt solidarity and cause network polarization and movement schism. Social network analysis offers great techniques to test these types of complex arguments, as the findings of this chapter reflect.

The political context and the medium through which communication occurs also govern the networks of activists. While these research findings support the application of the social movements theory of coalition building to Twitter networks, testing it on a range of other online networks will make generalization possible. The findings also suggest the need for other approaches to complement the non-structural approach of this chapter. To determine whether ideological polarization through online mediums conforms to the model of offline communication, in general or in the context of a micro-blogging platform such as Twitter, with its 140-character limit, requires further qualitative research.

In conclusion, the findings of this chapter affirm the application of the third factor of coalition building, the presence of previous ties, to predicting later solidarity in online networks. However, they also show that other factors, such as ideological congruence, can mitigate the effect of previous ties. Applying the social movements theory of coalition building to online networks requires caution because of the interaction of different factors.

Overall, based on the analysis in this chapter and that of the earlier chapters, this dissertation converges in the general point that the social movements theory of coalition building is relevant to online activist networks. Yet the findings suggest that on-the-ground and online repertoires complement rather than mirror each other. Further, the findings show that applying the social movements theory of coalition building to online activism requires caution. The concluding chapter of the dissertation expands on these points.

Conclusion

This research builds on the social movements theory of networks and coalition building, the theory of digital activism, and the social networks theory of organizations to study the rich case of online mobilization for the 2011 Egyptian revolution. I use the analytical tools of social network analysis to study Twitter networks of activists of the Egyptian revolution in early 2011, when solidarity characterized the movement, and late 2014, when schism spread it apart. In this, I investigate how the repertoire of online activism relates to the on-the-ground movement.

The social movements theory of networks states that activists' ideological congruence, the presence of bridge builders who bring the movement together, and the presence of previous ties among the activists are all factors of coalition building and movement solidarity. Chapters 3, 4, and 5 tested the role of these factors in the Twitter networks of Egyptian activists. The results suggest that digital activism complements rather than mirrors on-the-ground activism. While all three factors influence the network, they manifest somewhat differently than research has suggested they do in offline networks.

Ideological Congruence in Periods of Solidarity and Schism

Chapter three investigates ideological congruence in 2011 and 2014. It finds that at the beginning of the revolution and nearly four years later, the Twitter networks mirror both the solidarity of 2011 and the ideological schism of 2014.

At the beginning of the revolution, activists who hold disparate ideologies deliberated freely online, forming a common counterculture that facilitated mobilization

for the revolution. As activists from various ideologies camped together in Tahrir Square, they freely deliberated on Twitter. Discussion cliques were large and tightly knit in the sense that all members mentioned each other. Ideology was no barrier to discussion—that is, ideological homophily was absent.

Almost four years later in 2014, Twitter networks were more ideologically polarized. The solidarity of 2011 had been dismantled by differences over strategy and the difficulties of determining what should follow a 30-year authoritarian regime. Online discussion cliques were small and scattered. Ideology played a major role in online interactions; ideological homophily played a major role.

Chapter three contributes to the debate on the role of social media as providing tools of convergence or polarization. Its findings show that, in the context of the Egyptian revolution, Twitter reflected both the solidarity and the schism that existed in the streets. It contradicts previous literature—mostly relying on cross-sectional research that limits the findings to only one context—that has indicated that social media tools are either platforms of polarization or convergence, but not both.

Chapter three also contributes to the debate about the Arab Spring and the role of Twitter in it. While not claiming that the deposal of Mubarak was a Twitter revolution or that without Twitter there would be no revolutions, the mirroring it identifies suggests that in Egypt, Twitter was a good barometer of changing relations among the activists.

The Distinction between Online Bridge Builders and Offline Ground Brokers

Chapter four studies the presence of bridge builders among groups allied with different ideologies. Adding validity to the application of social movements theory to

online networks, the analysis shows that online brokers who connect different ideological

backgrounds are more prevalent during times of solidarity than times of schism.

Similarly, within-group brokerage was more prevalent during the period of schism. In

this, the social movements theory of networks applies to online networks.

However, comparing the identity of online bridge builders with offline brokers

shows a distinction between online and offline activism. In the later period of the

revolution, when fragmentation plagued the movement, online and on-the-ground brokers

did not align. Most on-the-ground brokers were members of organized groups who came

together into coalitions as early as 2011, such as the Coalition of the Youth of the

Revolution. By contrast, the activists who bonded the online network were either early

bloggers or celebrity activists. Most bloggers are citizen journalists who were politically

active online long before the revolution, while the Twitter accounts of celebrity activists

are meeting points that bring novel information to their many followers from different

ideological streams. The way Twitter is structured makes these accounts brokerage hubs

in which followers can get to know each other. Chapter four thus shows that the way

brokerage occurs online, through bloggers and celebrity accounts where activists

deliberate together or acquire news, is different than brokerage on-the-ground, which

manifests into the formation of real coalitions where social movements groups or

individual activists collaborate.

While online brokers do not fully mirror on-the-ground brokers and the effects of

brokerage are different, the findings of chapter four suggest that the Twitter and the

streets complement each other. Online brokers connect scattered people looking for

sources of online news while on-the-ground brokers bring different ideological backgrounds together to form actual revolutionary coalitions. Online activism provides news and political awareness that get diverse people interested in the movement and put them at virtual proximity. When a movement becomes active in the streets, activists affiliated with politically organized groups take up on the ground coordination.

The Role of Previous Ties and the Attenuation of New Members of the Network

Chapter five examines the mechanisms that underlie the schism in the later stage by testing whether previous ties predict future ties and the role of newcomers to the network. The activist Twitter network grew significantly between 2011 and 2014, and, as chapter three revealed, the network that had been unified became polarized.

As the social movements theory of coalition building suggests, the presence of previous ties predicts future ties. The network of activists who had been on Twitter in 2011 continued to communicate in 2014 with activists they had addressed in 2011. These findings suggest that the social movements theory of coalition applies to online networks. However, the presence of prior ties could not prevent the polarization of the network.

The late joiners mostly lacked prior ties to individuals with ideologies unlike their own. In general they connected only to people who shared their ideology. The late joiners were also more fragmented than the early joiners at any of the two time periods. Thus their ideological polarization and fragmentation became characteristic of the network as a whole. It disturbed the coalitions that the early activists formed and led to overall network fragmentation.

Schism can occur in networks in spite of prior connections, and in spite of the fact that as social movements theory of the causes of coalition building accurately predicts that they persist over time. Among Egyptian activists, the interaction of other factors, such as the ideological congruence of the new activists, attenuated the effect of the presence of previous ties and hindered the persistence of the 2011 coalition. These results underline the importance of considering the interaction of various factors when studying coalition building.

Theoretical Contributions

The research studying the unique Twitter dataset of activists in the Egyptian revolution adds validity to the traditional social movements theory of networks and coalition building. It shows that ideological congruence, the presence of bridge builders, and the presence of previous ties all support unity. By showing that these factors apply to online networking, it supports future research using this theory to digital activism.

The second theoretical contribution is the insight that the general claims of traditional social movements theory of networks and coalition building may be attenuated in the case of online networks. The change over time within networks of the Egyptian revolution shows that while ideological congruence affects networking, the political context shapes how it manifests. Ideology only affected the network in 2014. Likewise, online bridge builders and on-the-ground-brokers both play a powerful role. However, they are not necessarily the same people, and the processes through which brokerage operates online is different from brokerage on the ground. The fact that the introduction of new ideologically polarized activists to the network can reduce the effect of previous

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ties in bringing movement solidarity also suggests that the social movements theory of coalition building applies to online networks but in complicated ways. This research suggests that applying the social movements theory of coalition building to digital activism may require modifications.

The third theoretical contribution is to the field of digital activism. Most of the research on online activism—from the Arab Spring to movements in Iran, Moldova, and Spain to Occupy in the United States—has adopted a diffusion paradigm. These studies have focused on how the information about protests or political conversations circulated online and on identifying the key players who circulated it. Because of this focus, these studies were embedded into a theoretical framework based on theories of communication (González-Bailón, Borge-Holthoefer, and Moreno 2013), or offered new theoretical models to study cases of digital activism, suggesting that traditional social movements theories do not apply to online activism (Bennett and Segerberg 2012; Bennett, Segerberg, and Walker 2014). These studies at times have referenced the importance of using social network analysis; Bennett, Segerberg, and Walker write that such approaches can "open deeper paths [to understand] change in different crowds and over time as new conditions emerge" (2014:254).

Findings from the current study bear out the advantage of a network paradigm in relation to the online networks of the core activists in the Egyptian revolution over time. Through focusing on the core activists of the revolution and how their networks change between different periods of solidarity and schism, this research shows the validity of traditional social networks theories in relation to online activism. Future studies may be

able to answer new questions about the cases prior research on digital activism has investigated. For example they might identify the main lines of cleavage separating the different factions in the movement and how they affect online networks. Researchers might study the effect of new lines of cleavage such as gender or class. They might investigate how online networks of activists are structured at different points in time and whether these networks reflect the on-the-ground movement. Future research may examine online networks change over time and the role of brokers in creating coherence within a movement. How the role of these brokers differs at different political contexts also warrants further examination. All these questions rely on the networks rather than the diffusion paradigm.

The findings of this research also bear out the advantage of belonging to the model change school of thought rather than the scale change school (See chapter one for a distinction between the two schools). The findings highlight how social media can change the underlying mechanisms by which the processes of activism work, rather than its role in extending the scale of activism. Chapter three clarifies how social media presents a venue through which activists from diverse ideologies come together at times of solidarity and are set apart at times of schism. The chapter indicates how social media plays both roles of a unifying tool and a polarization platform depending on the political context in which activism occurs. Chapter four shows how social media creates new roles for online brokerage that go parallel to offline brokerage. It demonstrates how certain Twitter accounts play the role of brokerage hubs uniting people from diverse ideologies together. Chapter five illustrates the effect of the interaction of various factors, such as previous

ties and ideology, to bring about movement solidarity then to hinder it. These findings show changes in the processes by which activism works rather than just a change in its scale. These changes in the model of activism allow us to explore new horizons that social media can offer, more than just extending the scale of traditional activism due to an increase in speed or reachability.

This research also contributes to the ongoing debate on the role of social media tools in activism and the relation between them and on-the-ground mobilization. While previous research on digital activism focused on the leverage social media tools provide in terms of speeding and augmenting mobilization, this dissertation supports the use of the traditional social movements theory of coalition building in examining the role of social media among key activists. Findings show that traditional theories that were designed to explain on-the-ground mobilization also apply to online networks. Online solidarity and schism reflect on-the-ground political context. Yet, the roles online activists play are not necessarily the same as on-the-ground activists; the two realms complement rather than mirror each other.

This debate on the role of social media tools in activism is of particular interest to social movement activists. The research findings highlight new horizons that the repertoire of digital activism can offer. Through showing how solidarity and schism in the movement were reflected online, the findings show that the online repertoire is reliable to express characteristics of real communities and the ideological cleavages that characterize them. Activists can use Twitter networks as a stethoscope to spot lines of cleavage in the movement and to direct activism to overcome these cleavages, whether online or offline,

to reach a pursued solidarity. Activists can dig out the master frames and the messages that were circulating online and that brought tenuous solidarity. Activists can also reckon the power of social media as a tool to create a common collective identity at times where different ideological backgrounds were freely deliberating online. This does not suggest any relationship of causality or that online activism caused the solidarity offline or vice versa. It rather suggests that the two repertoires are strongly related that activists may use one of them to affect the other. The findings of the research also highlight how to identify brokerage online and the prevalence of the role of liaison brokers when the movement was united. This directs activists' attention to the importance of online brokerage and how it correlates with periods of movement solidarity. Activists can use this feature to circulate online messages to, or try to, connect targeted audiences from different ideological backgrounds, as this might have its impact on the offline world. However, the findings also show that digital and on-the-ground activism complement rather than totally mirror each other. Online brokers played a role in connecting activists of different ideologies online, but these online brokers did not map offline brokerage. There are two stories of activism played online and offline. While the two stories bear similarities, their actors are different and perform different roles in each repertoire. As there are new horizons that online activism can bring, there are also limitations on what it can offer or on the change it can bring. We cannot claim that the Egyptian revolution was a Twitter revolution. Looking at the multiple evidence of brutal crackdown and excessive use of force that were exercised against Egyptian activists since the beginning of the revolution and until the writing of this dissertation, there is a lesson that activists in Egypt, and in

authoritarian regimes in general, can learn; no matter what advantages social media can offer to activism, the distribution of power is still biased towards those who control the physical means of force. In face of military tanks and bullets, the revolution becomes no more a Twitter revolution. This lesson is important for understanding the limits of the repertoire of digital activism while at the same time acknowledging what it can achieve.

The lesson learned about the balance of power in the Egyptian revolution and the limits of digital activism challenges the theories that consider social media tools as empowering tools for activists. Castells (2009) asserts that power is "communication power." In a network society characterized by extensive use of the tools of online communication, activists are empowered through using these tools to reprogram the networks in society around their own values and interests, thus shaping the public mind. Castells (2009) argues that we can all act as potential paparazzi that expose leaders to the surveillance of the public. Gonzalez-Bailon and Wang (2016) challenge this idea through showing that the activists brokers who had the potential to bring together the Spanish Indignados Movement decided not to do so. Unlike the horizontal fluid networks that the theory of communication power describes, the Spanish Indignados' networks were fragmented and centralized in the hands of a few. This current dissertation also challenges this theory of power that builds on the assumption that communication reprograms the public mind and eventually brings change in the relations of power to the benefit of the activists. The findings of this research show that online activism reflected the weakness in the movement during its time of schism. Social media tools failed to empower the activists during that period. One can argue that empowerment takes a long time to bear

fruits. The findings of this research show that even in the long term this empowerment might not materialize, as there are aspects where the online and offline repertoires do not meet. The findings, especially in chapter four, show that online activists are not the same as on-the-ground activists. While the two realms resemble or reflect characteristics of each other, the main players of the two realms are different. We cannot look at how one repertoire empowers its audience and generalize it to the whole movement. There is a different on-the-ground battle that follows its separate rules and that also contributes to shaping the balance of power. On-the-ground activists, especially in authoritarian regimes like Egypt, face the coercive power of the state. When the crackdown on activism occurs, it affects both repertoires and undermines the power that social media can bring. This is supported by the findings of this research, as the period of schism and weakness in the movement was also reflected online. The online repertoire could not mend the movement during its period of weakness. That does not mean that the theory of communication power is totally discredited. It can still act as a guide to activists to the potential leverage that social media can offer them and that they can exploit to strengthen the movement, knowing that there are times this potential does not materialize.

   A final theoretical contribution of this dissertation relates to the social networks organizational theory. This dissertation adds to this branch of theory by giving new insights into the role of brokers in online networks of social movements. It presents a case where brokerage roles change to match the political context of movement solidarity or schism. It also shows how the various conceptual definitions of brokers advanced by social networks organizational theory apply to online brokers. Neither scholars of digital

activism nor scholars of social networks organizational theory have thoroughly studied this area.

Methodological Contributions and limitations

The first methodological contribution of this research lies in its use of social network analysis. Borrowing the conceptual tools the social network theory of organizations provides and the techniques of social network analysis enriches our understanding of traditional social movements theory and theories of digital activism. I used the conceptual tools of social network theory of organizations to identify key activists, especially brokers, and the various roles they play in online networks. I used the sophisticated techniques of social network analysis to study community clustering in networks, which provided a rigorous test of the ideological clustering and polarization that exists during periods of solidarity and schism. It offers powerful software to identify key players in the networks precisely and calculate their brokerage capacities. Social movements scholars mostly study these topics through qualitative interviews, which cannot illuminate large online networks. Social network analysis also offers advanced regression techniques that are more suitable to study networks than regression in regular statistics, as they account for the dependence of the cases. While the findings of this research are specific to Egypt's case study, the social network analysis techniques used build on theories that reveal generic features of networks at large and can therefore be generalized to other cases of digital activism.

One methodological problem that faces research that builds on social network analysis is the problem of inference. The text-based analysis of digital media networks is

limited in what it tells us about the intentions or strategies of content creators, the meaning of digital network ties to network participants, or the interpretations of message frames by digital media audiences. In this research, I tried to overcome the problem of inferring the meaning of brokerage through clearly operationalizing online and offline brokerage (See the methods part in chapter four). Yet, another limitation on interpreting the meaning of a mention tie among the activists is still present. There is the underlying assumption throughout this dissertation that the Twitter mentions relationship among the activists is a positive relationship. This assumption was supported by the findings that matched empirical evidence from on-the-ground activism. Nevertheless, the limitation on how to interpret the meaning of the mentions, and whether they mean a positive or negative relationship among the activists, will always remain a research challenge. That is why it is suggested that this research be complemented with text analysis of the content of the tweets to better infer the meanings of the bonding ties and the brokerage processes operating online. Structural interviews with the activists could have consolidated the results of this study through highlighting how online and on-the-ground activists perceive their ties and their brokerage roles. However, the intensive crackdown on activism in Egypt since the coup d'état in 2013 made such interviews with the activists an unsafe and almost impossible task during the time I conducted this research. It is recommended that future research undertake this important task to complement and consolidate the findings of the current study.

The second methodological contribution lies in choosing the types of networks studied and the unit of analysis for the research. In keeping with a networks rather than a

diffusion paradigm, I examined the Twitter mentions network of the activists rather than the Retweet or hashtag networks. While Retweet and hashtag networks reveal information diffusion and how cascades of information form online through sharing mechanisms among crowds, the mentions network reveals two-way communication. Thus it fits the current study, which involves social network analysis and how activists communicate together.

Most of the research on Twitter activism studies how people communicate around a specific hashtag. While valuable, this approach does not isolate the core networks of key activists. Theorists of new social media tools distinguish interpersonal communication expressed through the Twitter mentions network at the micro-level, the follower-followee network at the meso-level, and the hashtag network at the macro-level (Bruns and Moe 2014). Bruns and Moe describe hashtag activity as "the tip of the iceberg of communicative action" (2014:24). I chose the network of the activist rather than the network of a hashtag as the main unit of analysis. Thus I was able to illuminate how key activists communicated and how the core networks were formed, a level of analysis focusing on the hashtag would not have revealed.

Employing longitudinal analysis represents the third methodological contribution of this research. One of the methodological problems in research involving social network analysis is the lack of temporal analysis. Most of the research using social network analysis relies on static networks. Some studies show that using temporal evolution in network analysis improves the quality of the findings (Aggarwal 2011; Chakrabarti, Kumar, and Tomkins 2000). By analyzing two different time periods, this research mends

the problem of limited data that static networks offer and highlights changes in network structures that focusing on a single time period could not have revealed. It is recommended that future research investigate multiple points in time, especially periods that are characterized by heightened tensions in the streets.

The findings of this research thus highlight the need for further research to study networking within movements over time. They also call for using the powerful methodological tools of social network analysis to investigate more social movement cases, especially those that use online mobilization. As the methodology takes a structural perspective, it invites further qualitative research to complement this research through studying the contents of the tweets. Qualitative research would highlight the subjects of discussion among different ideological groups. It can give insights on the common themes that unite them during times of solidarity and the lines of cleavage during periods of schism. Qualitative research examining the content of tweets would also illuminate the networks the brokers facilitate and their purpose.

In conclusion, through studying the case of online mobilization of the Egyptian revolution and the rich dataset of the Twitter networks of the activists, this research kneads and contributes to three areas of theory: social movements theory of networks and coalition building, theory of digital activism, and social networks theory of organizations. It shows how the cutting edge analytical and methodological tools of social network analysis can add to our understanding of these branches of theory. It contributes to the ongoing debate on the relationship between online and on-the-ground activism, and calls

for more extensive research to integrate social movements theory to inform research on digital activism.

Five years after the Egyptian revolution, this dissertation remains relevant. Online activism has become expected. Almost half—49.2%—of people in the world have Internet (Internet World Stats 2016). Social media continues to grow, as Facebook boasts more than a billion unique users per month, and Twitter users average 310 million unique visitors per month (Internet World Stats 2016). The online and offline contexts will continue to complement one another, and the significance of activism that can reach out to millions in a fraction of a second will remain a subject of interest to social scientists.

Notes

[1] See for example the early blog posts of Wael Abbas on his blog, Alwa3y al-Misri (Misr Digital). Retrieved October 6, 2016 http://misrdigital.blogspirit.com

[2] Most of the online campaigns were to free bloggers who had been arrested such as Khaled Hamza and Abdul Moneim Mahmoud (Islamists) or Kareem Amer (Secular).

[3] The "We are all Khaled Said" group posted their statement on their Facebook page. Retrieved February 11, 2011
https://www.facebook.com/note.php?note_id=202388056441689

[4] Borge-Holthoefer et al. (2015) disagree with this view, concluding that the secular/Islamist axis does not necessarily map a pro/anti-coup opinion.

[5] This shows in how they identify themselves, see for example the website of the 6th of April Youth Movement. Retrieved October 6, 2016
https://shabab6april.wordpress.com/about/

[6] I was told this in an interview with the aide of the former minister of Youth during the rule of President Morsi. August 8, 2013.
A high officer in central intelligence also declared that they never cooperated with President Morsi and never gave him a true piece of information during his rule. The minister of Interior announced after Morsi's deposal that they were never willing to cooperate. Retrieved October 6, 2016
https://www.youtube.com/watch?v=yM58yrnMtg4

[7] For a map of all political parties in Egypt, see: Retrieved April 28, 2014
http://arabist.net/blog/2011/11/17/major-update-to-egypt-political-parties-map.html

[8] I collected the list of friends of Bel Trew on May 19, 2014.

[9] My Facebook friends are well situated to judge the prominence of bloggers as many of them are activists or directly connected to activists. Many witnessed the events of the revolution including camping in Tahrir Square during the first 18 days of the revolution.

[10] See Appendix A for a list of all accounts used in this study and their assigned ideologies.

[11] See the website of Deen Freelon for a full description of the program. Retrieved October 6, 2016 http://dfreelon.org/utils/recalfront/recal3/#doc

[12] Fleiss' Kappa is a statistical measure for assessing the reliability of agreement between a fixed numbers of raters (more than two).

[13] For details on the Free Monem campaign, see: Retrieved October 6, 2016 https://globalvoices.org/2007/04/16/arabeyes-egyptian-blogger-abdul-monem-mahmood-arrested/

[14] To access the blog of Hossam AlHamalawy, 3arabawy, see: Retrieved October 6, 2016 http://arabawy.org

[15] To access the blog of Zeinobia, Egyptian Chronicles, see: Retrieved October 6, 2016 http://egyptianchronicles.blogspot.ca

[16] To access the blog of AbdelRahman Ayaash, NoonPost, see: Retrieved October 6, 2016 http://www.noonpost.net

References

25 January Revolution. 2011. "Rudud al-fil Ledawat al-Hukuma Lilhewar ma al-Quwa
al-Muareda." (Reactions to Government's Call to Talks with the Opposition, in
Arabic). Retrieved February 20, 2015 http://egyptrev.net/details.aspx?id=24

Adamic, Lada, and Natalie Glance. 2005. "The Political Blogosphere and the 2004 U.S.
Election: Divided they Blog." *Paper Presented at 2nd Annual Workshop on the
Weblogging Ecosystem: Aggregation, Analysis and Dynamics*. Chiba, Japan.
Retrieved May 20, 2014
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.433.1499&rep=r
ep1&type=pdf

Agarwal, Sheetal, Lance Bennett, Courtney Johnson, and Shawn Walker. 2014. "A
Model of Crowd-Enabled Organization: Theory and Methods for Understanding
the Role of Twitter in the Occupy Protests." *International Journal of
Communication* 8:646–72.

Aggarwal, Charu C. 2011. "An Introduction to Social Network Data Analytics." Pp. 1–15
in *Social Network Data Analytics*, edited by C. C. Aggarwal. Boston, Mass:
Kluwer Academic Publishers.

Al-Ani, Ban, Gloria Mark, Justin Chung, and Jennifer Jones. 2012. "The Egyptian
Blogosphere: a Counter-Narrative of the Revolution." Pp. 17–26 in *Proceedings
of the ACM 2012 Conference on Computer Supported Cooperative Work*
Retrieved December 15, 2015
(https://www.ics.uci.edu/~gmark/Home_page/Research_files/CSCW2012Egypt.p

df).

Aljazeera. 2011a. "Ikhwan Misr Yuhawerun al-Hukuuma." (The Brotherhood of Egypt

Talks with the Government, in Arabic). Retrieved February 6, 2011

http://www.aljazeera.net/news/arabic/2011/2/6/إخوان-مصر-يحاورون-الحكومة

Aljazeera. 2011b. "Ikhwan Misr Yutalebun Beislahat Fawreyya." (The Brotherhood of

Egypt calls for Immediate Reforms, in Arabic). Retrieved February 14, 2011

http://www.aljazeera.net/news/arabic/2011/2/14/-إخوان-مصر-يطالبون-بإصلاحات-

فورية

Aljazeera. 2012. "Haraket Kefaya" (The Kefaya Movement, in Arabic). February 21,

2012. Aljazeera Arabic Website: In Focus. Retrieved November 12, 2014

http://www.aljazeera.net/programs/infocus/2012/2/21/حركة-كفاية

Aljazeera. 2014. "Shahed Ala AlAsr: Aljaysh Atah BeMubarak Lyughed Thawrat

Yanayer." (Witness to the Century: The Military Toppled Mubarak to Halt

January Revolution, in Arabic). You-Tube Website. Retrieved January 26, 2014

https://www.youtube.com/watch?v=BieYqBm_-jQ

Aljazeera Documentary. 2012. "Yawmeyat Al Thawra AlMesreyya" (Chronicles of the

Egyptian Revolution, in Arabic). Part 1. You-Tube Website. Retrieved November

12, 2014 https://www.youtube.com/watch?v=fId9-IFl0Sw

Almeida, Paul, and Linda Stearns. 1998. "Political Opportunities and Local Grassroots

Environmental Movements: The Case of Minamata." *Social Problems* 45: 37–60.

Alyoum AlSabei. 2011. "AlIkhwan: Muzaharat AlAzhar Laysat Lilrad Ala Milyuniyyat

AlTahrir." (The Brotherhood: AlAzhar Protest is not a Reaction to the Million

Man March in Tahrir, in Arabic). Retrieved November 25, 2011

http://www.youm7.com/story/2011/11/25/الإخوان-المظاهرة-الأزهر-ليست-لرد-على-

التحرير-المليونية/540338#.VZ7jwsYcP7V

Ansell, Christopher. 2001. *Schism and Solidarity in Social Movements: The Politics of*

Labor in the French Third Republic. Cambridge: Cambridge University Press.

Arab Social Media Report. 2014. "Citizen Engagement and Public Services in the Arab

World: The Potential of Social Media." 6th edition. Dubai: Mohammed Bin

Rashid School of Government. Retrieved December 15, 2015

http://www.arabsocialmediareport.com/UserManagement/PDF/ASMR6_En_Final

.pdf

Arab Social Media Influencers Summit. 2015. "Arab Social Media Report." Report

presented at the First Arab Social Media Influencers Summit. Dubai, March 2015.

Retrieved September 22, 2016

http://dmc.ae/img/pdf/white-papers/ArabSocialMediaReport-2015.pdf

Attia, Ashraf M., Nergis Aziz, Barry Friedman, and Mahdy F. Elhusseiny. 2011.

"Commentary: The Impact of Social Networking Tools on Political Change in

Egypt's "Revolution 2.0"." *Electronic Commerce Research and Applications*

10:369–74.

Axelrod, Robert. 1997. "The Dissemination of Culture: A Model with Local

Convergence and Global Polarization." *Journal of Conflict Resolution* 41:203–26.

Azab, Nahed A. 2012. "The Role of the Internet in Shaping the Political Process in

Egypt." *International Journal of E-Politics (IJEP)* 3(2):31–51.

Baldassari, Delia, and Mario Diani. 2007. "The Integrative Power of Civic Networks." *American Journal of Sociology* 113(3):735–80.

Bandy, Joe, and Jackie Smith, eds. 2005. *Coalitions Across Borders: Transnational Protest and the Neoliberal Order*. Lanham, Md.: Rowman and Littlefield Publishers.

Baraka, Ajamu. 2013. "The Military Coup in Egypt: Requiem for a Revolution that Never Was." *Counterpunch* Blog. Retrieved July 18, 2013 http://www.counterpunch.org/2013/07/18/requiem-for-a-revolution-that-never-was/

Barkan, Steven.1986. "Interorganizational Conflict in the Southern Civil Rights Movement." *Sociological Inquiry* 56:190–209.

Bastos, Marco, Rafael Raimundo, and Rodrigo Travitzki. 2013. "Gatekeeping Twitter: Message Diffusion in Political Hashtags." *Media, Culture and Society* 35(2):260–70.

BBC. 2012. "Egypt's New Assembly Elects Muslim Brotherhood Speaker." *BBC News*. Retrieved January 23, 2012 http://www.bbc.com/news/world-middle-east-16677548

Benford, Robert, and David Snow. 2000. "Framing Processes and Social Movements: An Overview and Assessment." *Annual Review of Sociology* 26:611–39.

Bennett, Lance. 2003. "Communicating Global Activism: Strengths and Vulnerabilities of Networked Politics." *Information, Communication, and Society* 6(2):143–68.

Bennett, Lance. 2012. "The Personalization of Politics: Political Identity, Social Media, and Changing Patterns of Participation." *The ANNALS of the American Academy of Political and Social Science* 644(1):20–39.

Bennett, Lance, and Alexandra Segerberg. 2012. "The Logic of Connective Action: Digital Media and the Personalization of Contentious Politics." *Information, Communication, and Society* 15(5):739–68.

Bennett, Lance, Alexandra Segerberg, and Shawn Walker. 2014. "Organization in the Crowd: Peer Production in Large-Scale Networked Protests." *Information, Communication, and Society* 17(2):232–60.

Bimber, Bruce, Andrew Flanagin, and Cynthia Stohl. 2005. "Reconceptualizing Collective Action in the Contemporary Media Environment." *Communication Theory* 15(4):365–88.

Blau, Peter M. 1977. *Inequality and Heterogeneity: A Primitive Theory of Social Structure.* New York: The Free Press.

Blau, Peter M. 1994. *Structural Contexts of Opportunities*. Chicago: The University of Chicago Press.

Borgatti, Stephen P. 1997. "Structural Holes: Unpacking Burt's Redundancy Measures." *Connections* 20(1):35–38.

Borgatti, Stephen P. 2003. *KeyPlayer 1.45: Software for Social Network Analysis*. Analytic Technologies: Boston.

Borgatti, Stephen P. 2006. "Identifying Sets of Key Players in a Social Network." *Computaional and Mathematical Organizational Theory* 12:21–34.

Borgatti, Stephen P., and Martin G. Everett. 2000. "Models of Core/Periphery
    Structures." *Social Networks* 21(4):375–95.

Borgatti, Stephen P., Martin G. Everett, and Linton C. Freeman. 2002. *UCINET 6 for
    Windows: Software for Social Network Analysis*. Harvard, MA: Analytic
    Technologies.

Borgatti, Stephen P., Martin G. Everett, and Jeffrey C. Johnson. 2013. *Analyzing Social
    Networks*. London, UK: SAGE Publications.

Borge-Holthoefer, Javier, Walid Magdy, Kareem Darwish, and Ingmar Weber. 2015.
    "Content and Network Dynamics Behind Egyptian Political Polarization on Twitter."
    Pp. 700–11 in Proceedings of the 18th ACM Conference on Computer Supported
    Cooperative Work and Social Computing. New York, USA. Retrieved June 15, 2016
    http://dl.acm.org/citation.cfm?id=2675163

Borland, Elizabeth. 2010. "Crisis as a Catalyst for Cooperation: Women's Organizing in
    Buenos Aires." Pp. 241–265 in *Strategic Alliances: Coalition Building and Social
    Movements*, edited by N. Van Dyke and H. McCammon. Minneapolis, MN:
    University of Minnesota Press.

Boyd, Danah, Scott Golder and Gilad Lotan. 2010. "Tweet, Tweet, Retweet:
    Conversational Aspects of Retweeting on Twitter." In *Proceedings of the 43rd
    Hawaii International Conference on Systems Sciences (HICSS)*. Retrieved June
    15, 2016 http://www.danah.org/papers/TweetTweetRetweet.pdf

Boyd, John P., William J. Fitzgerald, and Robert J. Beck. 2006. "Computing Core

Periphery Structures and Permutation Tests for Social Relations Data." *Social Networks* 28:165–78.

Bruns, Axel, and Hallvard Moe. 2014. "Structural Layers of Communication on Twitter." Pp. 15–28 in *Twitter and Society*, edited by K. Weller, A. Bruns, J. Burgess, M. Mahrt, and C. Puschmann. New York: Peter Lang Publishing.

Bruns, Axel, Tim Highfield, and Jean Burgess. 2013. " The Arab Spring and Social Media Audiences: English and Arabic Twitter Users and their Networks." *American Behavioral Scientist* 57(7):871–98.

Bryden, John, Sebastian Funk, and Vincent Jansen. 2013. "Word Usage Mirrors Community Structure in the Online Social Network Twitter." *EPJ Data Science*. Retrieved December 13, 2015 http://www.epjdatascience.com/content/2/1/3

Brym, Robert, Melissa Godbout, Andreas Hoffbauer, Gabe Menard, and Tony Huiquan Zhang. 2014. "Social Media in the 2011 Egyptian Uprising." The British *Journal of Sociology* 65(2):266–92.

Burt, Ronald. 1992. *Structural Holes*. Cambridge, MA: Harvard University Press.

Burt, Ronald. 2000. "The Network Structure of Social Capital." *Research in Organizational Behaviour* 22:345–423.

Burt, Ronald. 2005. *Brokerage and Closure*. New York: Oxford University Press.

Burt, Ronald S. 2015. "Reinforced Structural Holes." *Social Networks* 43:149–61.

Carley, Kathleen M. 2014. *ORA 3.0.9.9j for Windows: Software for Social Network Analysis*. Pittsburgh, PA: Center for Computational Analysis of Social and Organizational Systems (CASOS).

Castells, Manuel. 2009. *Communication Power*. New York: Oxford University

      Press.

Castells, Manuel. 2012. *Networks of Outrage and Hope: Social Movements in the*

      Internet Age. Cambridge: Polity Press.

Chadwick, Andrew. 2012. "Recent Shifts in the Relationship Between the Internet and

      Democratic Engagement in Britain and the United States: Granularity,

      Informational Exuberance, and Political Learning." Pp. 39–55 in *Digital media*

      and political engagement worldwide: A comparative study, edited by E. Anduiza,

      J. M. Jensen, and L. Jorba. Cambridge: Cambridge University Press.

Chakrabarti, Deepayan, Ravi Kumar, and Andrew Tomkins. 2006. "Evolutionary

      Clustering." Pp. 554–60 in *Proceedings of the 12th ACM SIGKDD International*

      Conference on Knowledge Discovery and Data Mining. August 2006,

      Philadelphia, PA. Retrieved October 15, 2016

      (http://dl.acm.org/citation.cfm?id=1150467).

Choudhary, Alok, William Hendrix, Kathy Lee, Diana Palsetia, and Wei-Keng Liao.

      2012. "Social Media Evolution of the Egyptian Revolution." *Communications of*

      the ACM 55(5):74–80.

Conover, Michael D., Jacob Ratkiewicz, Matthew Francisco, Bruno Goncalves, Filippo

      Menczer, and Alessandro Flammini. 2011. "Political Polarization on Twitter." Pp.

      89–96 in Proceedings of the 5th International AAAI Conference on Weblogs and

      Social Media. Retrieved January 15, 2015

https://www.aaai.org/ocs/index.php/ICWSM/ICWSM11/paper/viewFile/2847/327
5

Cornfield, Daniel, and Holly McCammon. 2010. "Approaching Merger: The Converging
Public Policy Agendas of the AFL and CIO, 1938-1955." Pp. 79–98 in *Strategic
Alliances: Coalition Building and Social Movements*, edited by N. Van Dyke and
H. McCammon. Minneapolis, MN: University of Minnesota Press.

Corrigall-Brown, Catherine, and David Meyer. 2010. "The Prehistory of a coalition: The
Role of Social Ties in Win Without War." Pp. 3–21 in *Strategic Alliances:
Coalition Building and Social Movements*, edited by N. Van Dyke and H.
McCammon. Minneapolis, MN: University of Minnesota Press.

Diani, Mario. 2003a. "Networks and Social Movements: A Research Programme." Pp.
299–318 in *Social Movements and Networks: Relational Approaches to Collective
Action*, edited by M. Diani and D. McAdam. Oxford: Oxford University Press.

Diani, Mario. 2003b. "Leaders or Brokers?" Pp. 105–22 in *Social Movements and
Networks: Relational Approaches to Collective Action*, edited by M. Diani and D.
McAdam. Oxfrod: Oxford University Press.

Diani, Mario. 2011. "Social Movements and Collective Action." Pp. 223–35 in *The Sage
Handbook of Social Network Analysis*, edited by J. Scott and P. Carrington.
London: Sage Publications Ltd.

Diani, Mario, and Doug McAdam, eds. 2003. *Social Movements and Networks:
Relational Approaches to Collective Action*. Oxford: Oxford University Press.

Diani, Mario, and Maria Kousis. 2014. " The Duality of Claims and Events: The Greek

Campaign Against the Troika's Memoranda and Austerity, 2010-2012."
Mobilization: An International Quarterly 19(4):387–404.

Diani, Mario, Isobel Lindsay, and Derrick Purdue. 2010. "Sustained Interactions? Social
Movements and Coalitions in Local Settings." Pp. 219–238 in *Strategic Alliances:
Coalition Building and Social Movements*, edited by N. Van Dyke and H.
McCammon. Minneapolis, MN: University of Minnesota Press.

Earl, Jennifer and Katrina Kimport. 2011. *Digitally Enabled Social Change: Activism in
the Internet Age.* Cambridge, Mass.: The MIT Press.

Earl, Jennifer, Heather Hurwitz, Analicia Mesinas, Margaret Tolan, and Ashley Arlotti.
2013. "This Protest will be Tweeted. Twitter and Protest Policing during the
Pittsburgh G20." *Information, Communication and Society* 16(4):459–78.

Elgomhoreya.tv. 2012. "AlAskar." (The Military, in Arabic). Retrieved January 17, 2012
https://www.youtube.com/watch?v=U-yhpPLtGQA

El Hamamsy, Walid. 2011. "BB = BlackBerry or Big Brother: Digital Media and the
Egyptian Revolution." *Journal of Postcolonial Writing* 47(4):454–66.

Ems, Lindsay. 2014. "Twitter's Place in the Tussle: How Old Power Struggles Play Out
on a New Stage." *Media, Culture, and Society* 36(5):720–31.

Esposito, Jeff. 2011. "Egypt's Social Media Revolution by the Numbers."
Jeffesposito.com, February 21. Retrieved August 8, 2016
http://jeffesposito.com/2011/02/21/egypts-social-media-revolution-by-numbers/

Faris, David. 2013. *Dissent and Revolution in a Digital Age: Social Media, Blogging and
Activism in Egypt*. London: I.B. Taurus.

Fendi, Mamun. 2011. "Al-Suqut Al-Akhlaqi Yati Awalan." (Ethical Fall Comes First, in

    Arabic). *Al-Sharq Al-Awsat*, September 5. Retrieved November 12, 2013

    http://revsoc.me/politics/kr-lqdm-lb-rydy-m-lb-sysy-wqtsdy/

Finamore, Carl. 2012. "Revolution & Counter Revolution in Egypt: Military Power

    vs. Protest." *Talking Union* Blog. Retrieved February 5, 2012

    https://talkingunion.wordpress.com/2012/02/05/revolution-counter-revolution-in-

    egypt-military-power-vs-protest/

Freeman, Linton C. 1977. " A Set of Measures of Centrality Based Upon Betweenness."

    Sociometry 40:35–41.

Freeman, Linton C. 1979. "Centrality in Social Networks: Conceptual Clarification."

    Social Networks 1:215–39.

Gehlert, Sarah, Bobbi J. Carothers, Jung Ae Lee, Jefferson Gill, Douglas Luke,

    and Graham Colditz 2015. "A Social Network Analysis Approach to Diagnosing

    and Improving the Functioning of Transdisciplinary Teams in Public Health."

    Transdisciplinary Journal of Engineering and Science 6:11–22.

Gerbaudo, Paolo. 2012. *Tweets and the Streets: Social Media and Contemporary*

    Activism. London: Pluto Books.

Gerhards, Jurgen, and Dieter Rucht. 1992. "Mesomobilization: Organizaing and

    Framing in Two Protest Campiagns in West Germany." *American Journal of*

    Sociology 98:555–95.

Ghonim, Wael. 2012. Revolution 2.0: *The Power of the People is Greater Than the*

    People in Power : a Memoir. Boston, Mass.: Houghton Mifflin Harcourt.

Gladwell, Malcolm. 2010. "Small Change: Why the Revolution will not be Tweeted."

    The New Yorker, October 4. Retrieved April 2015

    http://www.newyorker.com/magazine/2010/10/04/small-change-3

González-Bailón, Sandra, and Ning Wang 2016. "Networked Discontent: The Anatomy

    of Protest Campaigns in Social Media." *Social Networks* 44:95–104.

González-Bailón, Sandra, Javier Borge-Holthoefer, and Yamir Moreno. 2013.

    "Broadcasters and Hidden Influentials in Online Protest Diffusion." *American*

    Behavioral Scientist 57(7):943–65.

Gould, Roger V. and Roberto M. Fernandez 1989. "Structures of Mediation: A Formal

    Approach to Brokerage in Transaction Networks." *Sociological Methodology* 19:

    89–126.

Grossman, Zoltan. 2001. "'Let's not Create Evilness for this River': Interethnic

    Environmental Alliances of Native Americans and Rural Whites in Northern

    Wisconsin." Pp. 146–59 in *Forging Radical Alliances across Difference:*

    Coalition Politics for the New Millennium, edited by J. M. Bystydzienski and S.

    Schacht. London: Rowman & Littlefield.

Gruzd, Anatoliy, Wellman, Barry, & Takhteyev, Yuri. 2011. "Imagining Twitter as an

    Imagined Community." *American Behavioral Scientist* 55(10):1294–318.

Guenther, Katja. 2010. "The Strength of Weak Coalitions: Transregional Feminist

    Coalitions in Eastern Germany." Pp. 119–39 in *Strategic Alliances: Coalition*

    Building and Social Movements, edited by N. Van Dyke and H. McCammon.

    Minneapolis, MN: University of Minnesota Press.

Hamdy, Naila, and Ehab H. Gomaa. 2012. "Framing the Egyptian Uprising in Arabic

    Language Newspapers and Social Media." *Journal of Communication* 62:195–

    211.

Han, Shin-Kap. 2009. "The Other Ride of Paul Revere: The Brokerage Role

    in the Making of the American Revolution." *Mobilization: An International*

    Quarterly 14(2):143–62.

Hanneman, Robert A. and Mark Riddle. 2005. *Introduction to Social Network Methods*.

    Riverside, CA: University of California, Riverside (published in digital form at

    http://faculty.ucr.edu/~hanneman/).

Hargittai, Eszter, Jason Gallo, and Matthew Kane. 2008. "Cross-ideological Discussions

    among Conservatives and Liberal Bloggers." *Public Choice* 134:67–86.

Harlow, Summer and Lei Guo. 2014. "Will the Revolution be Tweeted or Facebooked?

    Using Digital Communication Tools in Immigrant Activism." *Journal of*

    Computer-Mediated Communication 19(3):463–78.

Hashim, Ahmed. 2011. "The Egyptian Military, Part Two: From Mubarak Onward."

    Middle East Policy Council 8(4). Retrieved December 15, 2015

    http://www.mepc.org/journal/middle-east-policy-archives/egyptian-military-part-

    two-mubarak-onward?print

Heaney, Michael, and Fabio Rojas. 2008. "Coalition Dissolution, Mobilization and

    Network Dynamics in the U.S. Antiwar Movement." *Research in Social*

    Movements, Conflicts and Change 28:39–82.

Hedstrom, Peter, Rickard Sandell, and Charlotta Stern. 2000. "Mesolevel networks and

the Diffusion of Social Moveemnts: The Case of the Swedish Social Democratic

Party." *American Journal of Sociology* 106:145–72.

Høigilt, Jacob. 2011. "Who's Who in the New Egypt? A Mapping of Prominent Actors of

Change." Working Paper 2011.2. Norwegian Peacebuilding Center. Retrieved

December 15, 2015 (http://www.ciaonet.org/catalog/21517).

Honeycutt, Courtenay, and Susan Herring. 2009. "Beyond Microblogging: Conversation

and Collaboration Via Twitter." In *Proceedings of the 42nd Hawaii International

Conference on Systems Sciences (HICSS)*. Retrieved December 15, 2015

http://ella.slis.indiana.edu/~herring/honeycutt.herring.2009.pdf

Howard, Philip and Muzammil Hussain. 2013. *Democracy's Fourth Wave: Digital Media

and the Arab Spring*. Oxford: Oxford University Press.

Howard, Philip, Aiden Duffy, Deen Freelon, Muzammil Hussain, Will Mari, and Marwa

Mazaid. 2011. "Opening Closed Regimes: What was the Role of Social Media

During the Arab Spring". Working Paper 2011.1. Project on Information

Technology and Political Islam. Retrieved December 15, 2015

http://pitpi.org/wp-content/uploads/2013/02/2011_Howard-Duffy-Freelon-

Hussain-Mari-Mazaid_pITPI.pdf

Isaac, Larry, and Lars Christiansen. 2002. "How the Civil Rights Movement Revitalized

Labor Militancy." *American Sociological Review* 67:722–46.

Isherwood, Tom. 2008. "A New Direction or More of the Same? Political Blogging in

Egypt." *Arab Media and Society*. Retrieved May 15, 2016

http://www.arabmediasociety.com/?article=693

Iskander, Elizabeth. 2011. "Connecting the National and the Virtual: Can Facebook

Activism Remain Relevant After Egypt's January 25 Uprising?" *International

Journal of Communication* 5:13–15.

Java, Akshay, Tim Finin, Xiaodan Song, and Belle Tseng. 2007. "Why we Twitter:

Understanding Microblogging Usage and Communities." Retrieved May 15, 2016

http://ebiquity.umbc.edu/_file_directory_/papers/369.pdf

Jensen, Jon. 2011. "Tahrir Revisited: Behind Egypt's Revolution: Youth and the

Internet." *The Groundtruth Project* Blog. Retrieved July 12, 2013

http://thegroundtruthproject.org/behind-egypts-revolution-youth-and-the-internet/

Jürgens, Pascal, Andreas Jungherr, and Harald Schoen. 2011. "Small Worlds With a

Difference: New Gatekeepers and the Filtering of Political Information on

Twitter." Article 21 in *Proceedings of the 3rd International Web Science

Conference.* Retrieved March 17, 2016 http://dl.acm.org/citation.cfm?id=2527034

Kelly, John, Daniel Fisher, and Marc Smith. 2005. "Debate, Division and

Diversity: Political Discourse Networks in USENET Newsgroups." Paper

presented at the Proceedings of the 2nd Conference on Online Deliberation:

Design, Research and Practice (DIAC 05) at Stanford University, May 2005, Palo

Alto, CA. Retrieved December 15, 2015

(http://www.coi.columbia.edu/pdf/kelly_fisher_smith_ddd.pdf).

Ketchley, Neil. 2014. "The Army and the People are One Hand! Fraternization and the

25th January Egyptian Revolution." *Comparative Studies in Society and History*

56(1):155–86.

Khamis, Sahar and Katherine Vaughn. 2011. "Cyberactivism in the Egyptian Revolution:

How Civic Engagement and Citizen Journalism Tilted the Balance." *Arab Media

and Society* 14. Retrieved March 17, 2016

http://www.arabmediasociety.com/?article=769

Kim, Hyojoung and Steven Pfaff. 2012. " Structure and Dynamics of Religious

Insurgency: Students and the Spread of the Reformation." *American Sociological

Review* 77 (2):188–215.

Kirkpatrick, David and David Sanger. 2011. "A Tunisian-Egyptian Link That Shook

Arab History." *New York Times*, February 13. Retrieved July 10, 2012

http://www.nytimes.com/2011/02/14/world/middleeast/14egypt-tunisia-

protests.html?pagewanted=all&_r=0

Krackhardt, David, and Robert N. Stern. 1988. "Informal Networks and Organizational

Crises: An Experimental Simulation." *Social Psychology Quarterly* 51(2):123–40.

Kwak, Haewoon, Changhyun Lee, Hosung Park, and Sue Moon. 2010. "What is Twitter,

A Social Network or a News Media?" In *Proceedings of the 19ᵗʰ International

Conference on World Wide Web.* Retrieved March 17, 2016

http://dl.acm.org/citation.cfm?id=1772751

Levi, Margaret, and Jilian Murphy. 2006. "Coalitions of Contention: The Case of the

WTO Protests in Seatle." *Political Studies* 54(4):651–70.

Lichterman, Paul. 1995. "Piecing Together Multicultural Community: Cultural

Differences in Community Building among Grass-Roots Environmentalists."

Social Problems 42:513–34.

Lim, Merlyna. 2012. "Clicks, Cabs, and Coffee Houses: Social Media and Oppositional

    Movements in Egypt, 2004–2011." *Journal of Communication* 62(2):231–48.

Lotan, Gilad, Erhardt Graeff, Mike Ananny, Devin Gaffney, Ian Pearce, And Danah

    Boyd. 2011. "The Revolutions Were Tweeted: Information Flows During the

    2011 Tunisian and Egyptian Revolutions." *International Journal of*

    Communication 5:1375–405.

Lynch, Marc. 2007. "Blogging the New Arab Public: Arab Blogs' Political Influence

    Will Grow." *World Politics Review*, April 10. Retrieved May 30, 2013

    http://www.worldpoliticsreview.com/articles/694/blogging-the-new-arab-public-

    arab-blogs-political-influence-will-grow

Lysenko, Volodymyr, and Kevin Desouza. 2012. "Moldova's internet revolution:

    Analyzing the role of technologies in various phases of the confrontation."

    Technological Forecasting and Social Change 79:341–61.

McAdam, Doug. 2003. "Beyond Structural Analysis: Toward a More Dynamic

    Understanding of Social Movements." Pp. 281–99 in *Social Movements and*

    Networks: Relational Approaches to Collective Action, edited by M. Diani and D.

    McAdam. Oxford: Oxford University Press.

McAdam, Doug, Sidney Tarrow, and Charles Tilly. 2001. *Dynamics of Contention*.

    Cambridge: Cambridge University Press.

McCammon, Holly, and Karen Campbell. 2002. "Allies on the Road to Victory:

    Coalition Formation Between the Suffragists and the Woman's Christian

    Temperance Union." *Mobilization* 7:231–51.

Mcpherson, Miller, Lynn Smith-Lovin, and James M. Cook. 2001. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology* 27:415–44.

Meraz, Sharon and Zizi Papacharissi. 2013. "Networked Gatekeeping and Networked Framing on #Egypt." *The International Journal of Press Politics* 18(2):138–66.

Merton, Robert K. 1968. *Social Theory and Social Structure*. New York: The Free Press.

Morozov, Evgeny. 2011. *The Net Delusion: The Dark Side of Internet Freedom*. New York: PublicAffairs.

Mische, Ann. 1995. "Projecting Democracy: The Formation of Citizenship Across Youth Networks in Brazil." *International Review of Social History* 40(3):131–58.

Mische, Ann. 2003. "Cross Talk in movements: Reconceiving the Culture-network Link." Pp. 258–80 in *Social Movements and Networks: Relational Approaches to Collective Action*, edited by M. Diani and D. McAdam. New York: Oxford University Press.

Nafithat Misr. 2011. "Bayan min Al-Ikhwan Al-Muslimin Bekhusus Ahdath Alsabt 19 November 2011." (A statement from the Muslim Brotherhood Regarding the Events of Saturday 19 November 2011, in Arabic). Retrieved November 20, 2011 http://old.egyptwindow.net/news_Details.aspx?News_ID=15513

Newman, M.E.J. 2006. "Modularity and Community Structure in Networks." Pp. 8577–82 In proceedings of the National Academy of Sciences. Retrieved May 17, 2015 http://web.stanford.edu/class/ee378b/papers/newman-community.pdf

Obach, Brian. 2004. *Labor and the Environmental Movement: A Quest for Common Ground*. Cambridge, Mass.: MIT Press.

Obstfeld, David. 2005. "Social Networks, the Tertius lungens Orientation, and

Involvement in Innovation." *Administrative Science Quarterly* 50(1):100–30.

O'Donnell, Catherine. 2011. "New Study Quantifies Use of Social Media in Arab

Spring." *UWToday,* September 12. Retrieved November 20, 2015

http://www.washington.edu/news/2011/09/12/new-study-quantifies-use-of-social-

media-in-arab-spring/

Oh, Onook, Chanyoung Eom, and H.Raghav Rao. 2012. "Collective Sense-Making

Through the Twitter Service During the 2011 Egypt Revolution." Paper presented

to Thirty Third International Conference on Information Systems, Orlando 2012.

Retrieved May 23, 2015

http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1187&context=icis2012

Osa, Maryjane. 2003. "Networks in Opposition: Linking Organizations Through Activists

in the Polish People's Republic." Pp. 77–104 in *Social Movements and Networks:*

Relational   Approaches to Collective Action, edited by M. Diani and D. McAdam.

Oxford; New York: Oxford University Press.

Papacharissi, Zizi, and Maria de Fatima Oliveira. 2012. "Affective News and Networked

Publics: The Rhythms of News Storytelling on #Egypt." *Journal of*

Communication 62:266–82.

Pavan, Elena. 2014. "Embedding Digital Communications within Collective Action

Networks: A Multidimensional Network Approach." *Mobilization: An*

International Quarterly 19(4):441–55.

Poell, Thomas, and Kaouthar Darmoni. 2012. "Twitter as a Multilingual Space: The

Articulation of the Tunisian Revolution Through #sidibouzeid.” *NECSUS* 1:14–
34.

Radsch, Courtney. 2008. “Core to Commonplace: The evolution of Egypt’s
blogosphere”. *Arab Media and Society.* Fall 2008 (6). Retrieved December 13,
2014 http://www.arabmediasociety.com/?article=692

Reger, Jo. 2002. “Organizational Dynamics and Construction of Multiple Feminist
Identities in the National Organization for Women.” *Gender and Society* 16:710–
27.

Reuters. 2011. “Egypt Opposition Backs ElBaradei as Negotiator: Brotherhood.”
Retrieved January 30, 2011 http://www.reuters.com/article/us-egypt-protests-
eryan-idUSTRE70T1HK20110130

Robnett, Belinda. 1997. *How Long? How Long? African-American Women in the
Struggle for Civil Rights*. New York: Oxford University Press.

Rose, Fred. 2000. *Coalitions across the Class Divide: Lessons from the Labor, Peace,
and Environmental Movements*. Ithaca, N.Y.: Cornell University Press.

Roth, Benita. 2010. ““Organizing One’s Own” as Good Politics: Second Wave Feminists
and the Meaning of Coalition.” Pp. 99–118 in *Strategic Alliances: Coalition
Building and Social Movements*, edited by N. Van Dyke and H. McCammon.
Minneapolis, MN: University of Minnesota Press.

Shafik, Mohammed, and Noha Hassan. 2009. “Leba Reyadeyya am Leba Siyaseyya and

Iqtesadeyya." (Sports Game or Political and Economic Game, in Arabic).

AlEshteraki, November, 25. Retrieved July 10, 2012 http://revsoc.me/politics/kr-lqdm-lb-rydy-m-lb-sysy-wqtsdy/

Shehata, Dina. 2012. "Youth Movements and the 25 January Revolution." Pp. 105–24 in

Arab spring in Egypt: Revolution and Beyond, edited by B. Korany and R. El-Mahdi. Cairo: The American University in Cairo.

Shirky, Clay. 2010. " The Twitter Revolution: More Than Just a Slogan." Prospect

Magazine. Retrieved June 22, 2016

http://www.prospectmagazine.co.uk/magazine/the-twitter-revolution-more-than-just-a-slogan

Shumate, Michelle, Janet Fulk, and Peter Monge. 2005. "Predictors of the International

HIV-AIDS INGO Network over Time". *Human Communication Research*

31:482–510.

Smith, Marc A., Lee Rainie, Itai Himelboim, and Ben Shneiderman. 2014. *Mapping*

Twitter Topic Networks: From Polarized Crowds to Community Clusters.

Washington DC: Pew Research Center. Retrieved December 15, 2015

(http://www.pewinternet.org/2014/02/20/mapping-twitter-topic-networks-from-polarized-crowds-to-community-clusters/).

Soueif, Ahdaf. 2011. "Novelist Ahdaf Soueif on Egypt's Revolution: "People Were

Rediscovering Themselves." *Democracy Now!*, March 8. Retrieved August 8,

2016

http://www.democracynow.org/2011/3/8/ahdaf_soueif_on_egypts_revolution_peo
ple

Staggenborg, Suzanne. 1986. "Coalition Work in the Pro-Choice Movement:
Organizational and Environmental Opportunities and Obstacles." *Social Problems*
33:374–90.

Staggenborg, Suzanne. 2015. "Event Coalitions in the Pittsburgh G20 protests." *The
Sociological Quarterly* 56(2):386–411.

Starbird, Kate, and Leysia Palen. 2012. "(How) Will the Revolution be Retweeted?
Information Diffusion and the 2011 Egyptian Uprising." In *Proceedings of the
ACM 2012 Conference on Computer Supported Cooperative Work (CSCW)*.
Retrieved December 13, 2015
https://cmci.colorado.edu/~palen/StarbirdPalen_RevolutionRetweeted.pdf

Suarez, John. 2012. "Mubarak's End: The Military Coup and the Popular Uprising."
Notes from the Cuban Exile Quarter. Blog Post. Retrieved October 6, 2016
http://cubanexilequarter.blogspot.ca/2012/01/mubaraks-end-military-coup-and-
popular.html

Sullivan, Earl (Tim). 2013. "Youth Power and the Revolution." Pp. 67–87 in *Egypt's
Tahrir Revolution*, edited by D. Tschirgi, W. Kazziha and S. F. McMahon.
Boulder, CO: Lynne Rienner Publishers.

Tadros, Sherine. 2012. "Egypt military's economic empire: Calls for accountability and
transparency grow at a time the military has fallen out of favour with the public."
Aljazeera. Retrieved February 15, 2012

http://www.aljazeera.com/indepth/features/2012/02/2012215195912519142.html

Tamburrini, Nadine, Marco Cinnerella, Vincent Jansen, and John Bryden. 2015.

    "Twitter Users Change Word Usage According to Conversation-Partner Social

    Identity." *Social Networks* 40:84–89.

Theocharis, Yannis. 2013. "The Wealth of (Occupation) Networks? Communication

    Patterns and Information Distribution in a Twitter Protest Network." *Journal of*

    Information Technology and Politics 10:35–56.

Theocharis, Yannis, Will Lowe, Jan W. van Deth, and Gema García-Albacete. 2015.

    "Using Twitter to mobilize protest action: online mobilization patterns and action

    repertoires in the Occupy Wall Street, Indignados, and Aganaktismenoi

    movements." *Information, Communication, and Society* 18(2):202–20.

Tindall, David. 2002. "Social networks, Identification and Participation in an

    Environmental Movement: Low-Medium Cost Activism within the British

    Columbia Wilderness Preservation Movement." *Canadian Review of Sociology*

    and Anthropology 39: 413–52.

Tindall, David. 2004. "Social Movement Participation Over Time: An Ego-Network

    Approach to Micro-Mobilization." *Sociological Focus* 37:163–84.

    Tavaana. n.d. "Blogger Wael Abbas: Exposing Corruption in Egypt." *Tavaana*

    Blog. Retrieved December 19, 2015 https://tavaana.org/en/content/blogger-wael-

    abbas-exposing-corruption-egypt-0

Tremayne, Mark. 2014. "Anatomy of Protest in the Digital Era: A Network Analysis of

Twitter and Occupy Wall Street." *Social Movement Studies: Journal of Social, Cultural and Political Protest* 13(1):110–26.

Van Aelst, Peter, and Stefaan Walgrave.2004. "New Media, New Movements? The Role of the Internet in Shaping the 'Anti-Globalization' Movement." Pp. 87–108 in *Cyberprotest: New Media, Citizens, and Social Movements*, edited by W. van de Donk, B. D. Loader, P. G. Nixon, and D. Rucht. New York: Routledge.

van de Donk, Brian D. Loader, Paul. G. Nixon, and Dieter Rucht, eds. 2004. *Cyberprotest: New Media, Citizens, and Social Movements.* New York: Routledge.

Van Dyke, Nella. 2003. "Crossing Movement Boundaries: Factors that Facilitate Coalition Protest by American College Students, 1930-1990." *Social Problems* 50:226–50.

Vasi, Ion Bogdan. 2011. "Brokerage, Miscibility, and the Spread of Contention." *Mobilization: An International Journal* 16(1):11–24.

Weber, Ingmar and Kiran Garimella. n.d. "#Egypt: Visualizing Islamist vs. Secular Tension on Twitter" Retrieved November 15, 2015 http://sc1.qcri.org/twitter/egypt/weekly/paper_3104.pdf

Weber, Ingmar, Venkata. R. Kiran Garimella, and Alaa Batayneh. 2013. "Secular vs. Islamist Polarization in Egypt on Twitter." Pp. 290–97 in *Proceedings of the 2013 International Conference on Advances in Social Network Analysis and Mining ASONAM*. August 2013, Niagra Falls, ON. Retrieved December 15, 2015 (http://www.qcri.com/app/media/1900).

Wood, Lesley. 2012. *Direct Action, Deliberation, and Diffusion*. New York: Cambridge

    University Press.

Yardi, Sarita, and Danah Boyd. 2010. "Dynamic Debates: An Analysis of Group

    Polarization Over Time on Twitter." *Bulletin of Science, Technology and Society*

    30(5):316–27.

Zald, Mayer N., and John D. McCarthy. 2009. "Social Movement Industries:

    Competition and Conflict Among SMOs." Pp. 161–84 in *Social Movements in an*

    Organizational Society: Collected Essays, edited by M. N. Zald, and J. D.

    McCarthy. New Brunswick, NJ: Transaction Publishers.

APPENDIX A
List of Twitter Handles Used in the Study and their Assigned Ideologies

Twitter Handle	Ideology
belal	Socialist
3arabawy	Socialist
3yyash	Islamist
A_Moniem	Islamist
AAriny	Islamist
Abdurrahmanezz	Islamist
AhmdAlish	Islamist
AhmedFatah	Socialist
alaa	Socialist
AlDostourP	Liberal
alfadyla	Islamist
Almohafezeen	Liberal
alnagar80	Liberal
Alshaheeed	Liberal
alwafdportal	Liberal
Alwasatpartyeg	Islamist
amrelhady4000	Liberal
amrwaked	Socialist
AnonOpWorld	Liberal
arahmanyusuf	Liberal
AsmaaMahfouz	Liberal
AymanNour	Liberal
Baraa_Ashraf	Liberal
basemfathy	Liberal
Bassem_Sabry	Liberal
belalfadl	Liberal
benaatanmia	Islamist
bothainakamel1	Socialist
DaliaEzzat_	Liberal
demaghmak	Liberal
DoctorMahsoob	Islamist
DrAbolfotoh	Islamist
DrBassemYoussef	Liberal
DrHigazy	Liberal
Egy_SDP	Socialist
EgyptGreenParty	Liberal
EladlParty	Liberal
ElBaradei	Liberal

elnourpartynews	Islamist
elshaabnews	Islamist
EslahNahda	Islamist
Esraa2008	Liberal
Estqlalparty	Islamist
FadelSoliman	Islamist
fakharany90	Islamist
FJparty	Islamist
Fjportal2012	Islamist
GameelaIsmail	Liberal
ghadasha	Liberal
gharbeia	Liberal
Ghonim	Liberal
GhostyMaher	Liberal
HamdeenSabahy	Socialist
HamzaNamira	Liberal
HamzawyAmr	Liberal
hatemazzam	Islamist
Hazem__Azim	Liberal
HisbMisr	Socialist
hossambahgat	Liberal
HTEgypt	Islamist
igeorgeus	Liberal
ikhwantawasol	Islamist
Ikhwanweb	Islamist
Islam_lotfy	Islamist
ismail_alex	Islamist
kalnaga	Liberal
KareemAmer	Liberal
Khaledali251	Socialist
KhaledMansour25	Islamist
makassas	Islamist
MaLek	Liberal
malekadly	Liberal
Mamdouh_Hamza	Liberal
manal	Socialist
mar3e	Liberal
marym_1279	Socialist
Masralthawra	Islamist
MasreyeenAhrrar	Liberal
minazekri	Liberal
MisrAlQawia	Islamist

MoatazAFattah	Liberal
Mohameddiab678	Liberal
moneimpress	Islamist
mosaaberizing	Islamist
mqazzaz	Islamist
mrmeit	Liberal
naderbakkar	Islamist
NadyaHassan	Liberal
NaguibSawiris	Liberal
nawaranegm	Socialist
NohaAtef	Liberal
NoraYounis	Socialist
nsoliman	Liberal
omertaher	Liberal
RashaPress	Socialist
RevSocMe	Socialist
samehsamir	Socialist
SamhyMostafa	Islamist
Sandmonkey	Liberal
shabab6april	Liberal
Ta7alof	Socialist
tamarrod	Liberal
TamimBarghouti	Liberal
tarekshalaby	Socialist
TheBigPharaoh	Liberal
waelabbas	Socialist
WafaaMSabry	Liberal
waiel65	Liberal
WataniaTaghyeer	Liberal
Zeinobia	Liberal
zelaky	Liberal
zyadel3laimy	Socialist