

# Tweeting Beyond Tahrir: Ideological Diversity and Political Tolerance in Egyptian Twitter Networks

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## Abstract

In an increasingly repressive and polarized political climate, social media data provide unique insights into shifting Egyptian attitudes as well as the evolving structure of the political communication networks through which elites and engaged citizens interact. Taking advantage of this novel data opportunity and motivated by a diverse body of political science literature that emphasizes the positive relationship between intergroup contact and political tolerance, this paper evaluates the extent to which Egyptians in ideologically diverse Twitter networks exhibit greater political tolerance than those in more homogenous networks.

More specifically, guided by the elite cue literature, this paper investigates whether exposure to elite cues through Twitter influences tolerance directly or moderates the relationship between non-elite network diversity and tolerance. Additionally, by using dose-response analysis (Cerulli, 2012) to assess how the amount of time a user has spent in a diverse Twitter network impacts these relationships, this paper begins to unpack the direct effect of online political communication networks on attitudes over time, confronting endogeneity concerns that often arise in analyses of political tolerance. My findings that both non-elite network diversity and exposure to diverse elite cues are significantly related to political tolerance—and that these relationships are intensified for users that have spent more time on Twitter—provide a unique contribution to the tolerance and elite cue literatures, while enriching the ongoing debate in the Internet and politics literature over the effect of online social networks on political attitudes and behavior.

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# 1 Introduction

While democratic reform has been elusive in post-revolution Egypt, mass political communication through social media has grown and evolved at extraordinary rates, fundamentally altering the information environment and social networks through which large numbers of politically engaged Egyptians interact (Howard & Hussein, 2013; Jibril, 2013). In an increasingly repressive and polarized political environment, social media data provide new insight into the shifting attitudes of politically engaged Egyptians, as well as the structure of the networks through which they receive information and discuss politics. Taking advantage of this unique data opportunity and motivated by a diverse body of social science literature that emphasizes the positive relationship between intergroup contact or crosscutting social network ties and political tolerance, in this paper I ask: Do Egyptians with ideologically diverse Twitter networks exhibit greater political tolerance than those in more homogenous networks?

Unlike traditional survey methods that rely on self-reported descriptions of an individual’s network (Gibson, 2001; Mutz, 2006), Twitter’s architecture allows for analysis of users’ connections to elites, media sources, activists, and other politically engaged citizens on the same platform, providing valuable, detailed insight into the structure of individuals’ communication networks and the sources from which they receive political information. Furthermore, the informality and immediacy of tweets offers instant information about engaged individuals’ political attitudes with less of the social desirability bias that may arise from asking survey questions about politically sensitive topics—especially in undemocratic polities (see Lynch, 2006 for a discussion of these issues in the Arab context).

By using Egyptian Twitter data to measure the relationship between network diversity and political tolerance in a more detailed and complete manner than traditional survey methods allow, this paper’s innovative measurement strategy and use of data from a region undergoing dramatic political transformation makes a novel contribution to the tolerance literature. Additionally, by examining the extent to which exposure to elite cues through Twitter predicts tolerance directly or moderates the relationship between non-elite network diversity and tolerance, this paper also contributes to the elite cue literature, which has largely neglected developing democracies and countries undergoing post-authoritarian transitions. Finally, through employing dose-response analysis (Cerulli, 2012) to assess the degree to which time spent in a diverse Twitter network intensifies the relationship between network diversity and tolerance, this paper begins to unpack the direct effect of online political communication on attitudes over time, making a contribution to the burgeoning Internet and politics literature and confronting endogeneity concerns that often arise in political tolerance studies (Ihlanfeldt, 2002; Lewis, 2011; Skipworth, Garner, & Dettrey, 2010; Dyck & Pearson-Merkowitz, 2006).

The remainder of this paper is organized as follows: Section 2 provides theoretical motivation and introduces the reader to the Egyptian Twittersphere as a setting for studying political tolerance.

Section 3 puts forth the primary hypotheses to be tested in the paper. Section 4 describes the data, measurement and empirical strategies to be employed. Section 5 presents the results and Section 6 addresses endogeneity concerns using dose-response analysis (Cerulli, 2012). Finally, Section 7 offers conclusions and outlines steps for further research.

## 2 Theoretical Motivation and Expectations

### Social Network Diversity and Political Tolerance

Social scientists have long posited that exposure to political diversity through individuals' social networks contributes to political tolerance by broadening horizons and providing a basis of macrosocial integration (Blau, 1974; Nunn, Crockett, & Williams, 1978). Most studies of the relationship between network diversity and political tolerance follow the logic of the contact hypotheses, first developed in the 1950s, which posit that contact with "out-groups" alleviates hostility by undermining false stereotypes and drawing attention to individual characteristics rather than group generalizations (Allport, 1954).

However, intergroup contact alone is often thought to be insufficient to increase tolerance, as people rely on cues to determine the prevailing norms that are accepted by members of their social networks. In particular, when people perceive that their in-group peers have a negative view of an out-group, they are less willing to consider new information about out-group members, for fear of social sanction (Tezanos-Pinto, Bratt, & Brown, 2010). As Dyck and Pearson-Merkowitz (2014) explain, "contact is most effective if and when people perceive that it is socially acceptable to view the out-group in a positive light" (p. 557).

While most of the contact hypothesis literature focuses on interethnic or interracial tensions (Brewer & Miller, 1988; Desforges, Lord, Ramsey, & Mason, 1991; Jackman & Crane, 1986; Levin, van Laar, & Sidanius, 2003; Pettigrew, 1998), a sizable body of political psychology literature has highlighted the importance of intergroup contact for political tolerance. These studies indicate that political tolerance is facilitated by cross-cutting interactions (Harrison & Bennett, 1995; Frey, 1995; Pettigrew, 1997; Calhoun, 1988) and that such tolerance plays a fundamental role in the democratic consolidation process, by enabling greater awareness of legitimate rationales for oppositional views, and motivating citizens to care about upholding the civil liberties of those with whom they personally disagree (Mutz, 2002; 2006). More specifically, Mutz (2006) writes that "the capacity to see that there is more than one side to an issue, that a political conflict is, in fact, a *legitimate* controversy with rationales on both sides, translates to greater willingness to extend civil liberties to even those groups whose political views one dislikes a great deal" (p. 85). Given the impact of exposure to diverse ideological views on political tolerance, the composition of citizens' social networks has been shown to have substantive consequences for both political tolerance and democratic

legitimacy more broadly (Mutz, 2002; 2006; Dutch & Gibson, 1992).

Studies of the relationship between intergroup contact and tolerance indicate that exposure to social network diversity need not come from direct interpersonal contact with out-group members (Mutz 2001; Calhoun 1988). As Calhoun (1988) argues, “in modern societies, most of the information we have about people different from ourselves comes not through any direct relationships, even the casual ones formed constantly in urban streets and shops. Rather it comes through print and electronic media” (p. 225). Similarly, as Mutz (2001) describes, “the future of communication across lines of political difference lies in technologies that transcend geographic space” (p. 97). This indicates that online social network diversity can be considered a form of intergroup contact—albeit quite different from the version Allport initially envisioned in the 1950s.

## Elite Cues and Political Tolerance

While studies of social network diversity and political tolerance tend to focus on communication among ordinary citizens, several bodies of social science literature indicate that exposure to diverse (or homogenous) *elite cues* may also be a determinant of political tolerance or attitudes toward an out-group (Dyck & Pearson-Merkowitz, 2014; Baumer, Messner & Rosenfeld, 2003). Many studies of political behavior in both the American and comparative contexts find that citizens rely on simple and reliable cues from elites in order to make policy judgments (Popkin, 1991; Wittman, 1995; Lupia, 1994; Lupia & McCubbins, 1998; Druckman, 2001). Borrowing on past studies that define political tolerance as the degree to which citizens will support policies extending civil liberties to rival political groups or groups advocating highly disagreeable viewpoints and ideologies, political tolerance can be understood as a policy judgment in favor of extending civil liberties to members of an out-group (Stouffer, 1980; Gibson & Gouws, 2003; Hinckley, 2010; Petersen, Slothuus, Stubager, & Togeby, 2011; Sullivan & Hendriks, 2009).<sup>1</sup>

Elites often have incentives to shape public opinion toward an out-group, and when elites perceive a threat to their power from an influential out-group, they may advocate punitive policies or work to mobilize public opinion against the group (Baumer Messner, & Rosenfeld, 2003; King & Wheelock, 2007). As Baumer et al. explain, “elites mobilize public opinion in the direction of more punitive attitudes [toward out-groups] to further their interests, and they are particularly likely to do so under threatening conditions” (p. 850). By contrast, exposure to diverse elite cues through the opening of the media that often occurs during post-authoritarian transitions moves public opinion against policies that violate the civil liberties of an opposition or out-group (see Stein, 2008). In this way, elite cues may play a role in shaping individual opinion toward an out-group, especially in a polarized political environment.

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<sup>1</sup>For a more complete discussion of the evolution of this definition in the tolerance literature, see Section 4.

## Cue-Contact Theory and Political Tolerance

Connecting elite cue theory to political tolerance, Allport notes that the effect of intergroup contact on tolerance relies on “authority support” (1954). Following Allports logic, Pettigrew (1998) explains, “with explicit social sanction, intergroup contact is more readily accepted and has more positive effects. Authority support establishes norms of acceptance” (p. 67). Both early and more recent studies of the effects of intergroup contact on tolerance support this finding (Landis, RO, & Day, 1984; Morrison & Herlihy, 1992; Parker, 1968; Pettigrew & Tropp, 2006; Pettigrew, 1998; Tredoux & Finchilescu, 2010; Stangor, Sechrist & Jost, 2001; Dyck & Pearson-Merkowitz, 2014).

However, in a highly polarized political environment, the authority figures that citizens view to be credible may vary based on ideological or partisan identification, and such filters may moderate the effect of intergroup contact on tolerance (Dyck & Pearson-Merkowitz, 2014). For example, in the American context, examining support for same sex marriage policies among heterosexual respondents with gay family members, friends, co-workers, and acquaintances, Dyck and Pearson-Merkowitz (2014) find a strong contact effect among Democrats, but little contact effect among Republicans. Using a cue-contact interaction approach the authors find that in developing opinions about public policies that target out-groups, social contact *and* partisan cues together explain significantly more about attitudes toward out-groups than either does alone. They argue that party elites “serve as indicators for the public of the social norms within their political in-group,” and assist citizens in translating in-group norms into political attitudes and behaviors (p. 8).

Dyck and Pearson-Merkowitz’s cue-contact approach suggests that since the effect of intergroup contact (or social network diversity) is influenced by authority support (Allport, 1954), elite cues inform individuals about the prevailing social norms in their in-group and can moderate the effect of intergroup contact on the development of positive political opinions of an out-group. More precisely, the cue-contact interaction framework hypothesizes that contact with out-groups will produce support for pro-out-group policies (or opposition to anti-out-group policies) when elite cues do not explicitly reject acceptance of the out-group.

## Social Media, Political Behavior, and Political Transitions

In addition to the tolerance, elite cues, and cue-contact literatures, the emerging Internet and politics literature on the impact of social media on political behavior in societies undergoing political transitions also provides insight into the potential relationship between network diversity and tolerance in the context of the Egyptian Twittersphere.

While much of the literature on the role of social media in countries transitioning from authoritarian rule focuses on the impact of online social networks on protest dynamics and regime change (Howard & Hussein, 2013; Aday, Harrell, Lynch, & Sides, 2010; Tufekci & Wilson, 2012), media and communications scholars have demonstrated that a substantial increase in the use of new media

is more likely to follow a significant amount of protest activity than to precede it (see Wolfsfeld et al., 2013). As social media use increases dramatically, especially in times of political transition, the potential for digital media to facilitate the creation of ad hoc, flexible networks of political communication outside of traditional civil society networks and media centers increases dramatically (Anduzia, Jenson & Jorba, 2012). This phenomenon has caused many academics and journalists alike to embrace online social networks as new potential forces of democratization (Shirky, 2011; Effing, van Hillegersberg, & Huibers, 2011; Kassim, 2012).

Some posit that unlike traditional media, social media has a channeling function of bringing users via digital links of interest to related political material (Coleman & Blumler, 2009), thus allowing individuals to gather more information and develop higher levels of political knowledge and efficacy (see Vitak, Zube, Smock, Carr, Ellison, & Capmple, 2011). Others have suggested that online social networks force users to confront political information that they would otherwise avoid (Zhang, Fuehres, & Gloor, 2011) and that political exchanges on social media can facilitate information sharing (Wojcieszak & Mutz, 2009). Most optimistically, online social networks have been seen as a means of spreading information and proliferating points of contact across political and sectarian divides (Aday et al., 2010).

Conversely, another branch of the Internet and politics literature suggests that the increasing heterogeneity of political information to which citizens have access (Farrell, 2012) exposes individuals to information that reinforces their existing views, allowing them to avoid challenging opinions (Sunstein, 2001; Garrett, 2009), and creating “echo-chamber environments” that foster social extremism and political polarization (Adamic & Glance, 2005). Interestingly, in their study of ideological homophily and segregation on Twitter, Halberstam and Knight (2014) find that the degree of ideological segregation in Twitter networks is similar to that in networks of face-to-face interactions with friends and co-workers. This suggests that while Twitter users may interact more with those who share their ideologies, this phenomenon may not be distinct from the propensity to do so in one’s daily off-line life.

While these conflicting views and findings in the Internet and politics literature do not resolve the debate over the effect that online social networks may have on political tolerance or political behavior more broadly, online social networks are increasingly recognized as motivators of political behavior, and have the power to drive key changes in intergroup relationships and attitudes by either “bonding” group members to one another, or “bridging” members of different groups (Aday et al., 2010).

## **The Egyptian Twittersphere**

The manner in which social media has transformed and continues to alter the structure of political communication in Egypt, especially in the current climate of intensified of Islamist-Secular polarization, provides further insight into the potential relationship between online social network

diversity and political tolerance in Egypt.

Since the outbreak of the Arab Spring protests in late 2010, social media use among Arabs has grown exponentially, with the proportion of Arabic language tweets and tweets coming from the Middle East rising dramatically over the past few years (Liu et al., 2014). Furthermore, the use of online social networks for political discussion has become increasingly common, with the percentage of Arab social media users who report discussing politics online ranging from 60 to 72% across the region (Pew, 2014). Describing this transformative process, Tufekci and Wilson (2012) write, “events in North Africa and the Middle East are now being shaped by a new system of political communication, which sets into sharp relief the importance of digitally mediated interpersonal communication” (p. 15).

In Egypt, social media has evolved from a tool initially used by tech-savvy educated youth and activists to an integral form of political communication for diverse groups in Egyptian society including students, blue collar workers, and even the elderly (El-Khalili, 2013). Furthermore, recognizing the power of online social networks as a political tool, elites across Egypt’s political spectrum have engaged in social media use, from aged military generals to Salafi clerics and Muslim Brotherhood politicians (El-Khalili, 2013). As Table 1<sup>2</sup> below indicates, Islamist and Secular politicians and political movements from across the political landscape are followed by large numbers of Egyptian citizens on Twitter.<sup>3</sup>

Table 1: **Top 20 Egyptian Politicians and Political Movements by Twitter Followers**

Handle	Name	Followers	Ideology	Biography
@amrkhaled	Amr Khaled	2667999	Islamist	Former head of the Egypt Party, Preacher
@ElBaradei	Mohamed El Baredai	2435248	Secular	Former VP, Constitution Party Head
@MuhammadMorsi	Muhammad Morsi	2026386	Islamist	Former President of Egypt
@HamdeenSabahy	Hamdeen Sabahy	1954326	Secular	Head of Popular Current Party
@HamzawyAmr	Amr Hamzawy	1838439	Secular	Head of Masr Al-Huriya Party
@DrAbolfotoh	Abdel Moneim Aboul Fotouh	1545437	Islamist	Former Pres. Candidate, Strong Egypt Party
@NaguibSawiris	Naguib Sawiris	1445649	Secular	Head of Free Egyptians Party
@AymanNour	Ayman Nour	1217582	Secular	Head of Al-Gahad Party, Former Pres. Candidate
@GameelaIsmail	Gameela Ismail	1126805	Secular	Constitution Party Former Presidential Candidate
@amremoussa	Amre Moussa	1112843	Secular	Former Head of Conference Party
@naderbakkar	Nader Bakkar	863505	Islamist	Al Nour Party Spokesperson
@shabab6april	April 6th Youth	806764	Secular	April 6th Youth Movement Official Twitter
@Essam_Elerian	Essam Elarian	689893	Islamist	Vice Chairman of the Freedom and Justice Party
@FJparty	Freedom and Justice Party	633982	Islamist	Freedom and Justice Party Official Twitter
@Saad_Elkatatny	Saad Elkatatny	623642	Islamist	Freedom and Justice Party Chairman
@bothainakamel1	Bothaina Kamel	568562	Secular	Independent Presidential Candidate
@HazemSalahTW	Hazem Abu Ismail	553096	Islamist	Former Salafi Presidential Candidate
@AhmedShafikEG	Ahmed Shafik	474945	Secular	Former PM and Head of the Egyptian Patriotic Mov.
@AsmaaMahfouz	Asmaa Mahfouz	421758	Secular	Founder of April 6th Movement
@lassecgen	Nabil Elaraby	393189	Secular	Former member of Mubarak Gov’t
@almorshid	Mohammed Badie	390546	Islamist	Supreme Guide of the Muslim Brotherhood

<sup>2</sup>Table is compiled using Twitter Counter data, described further in Section 4.

<sup>3</sup>While many of these followers are Egyptian, Egyptian political elites are also followed by other Arabs or Twitter users with interest in Egyptian politics from around the world. For a complete list of Egyptian Political Elites with 10,000+ Followers, see Table 5 in the Appendix.

A feeling of resentment toward both state-owned and private media coverage of the January 2011 revolution initially prompted many Egyptians to turn to online social networks (Solayman, 2011). During the revolution, the Egyptian media depicted protestors as paid enemies trying to incite violence and chaos, and social media became a popular alternative (El-Khalili, 2013). As media censorship and bias has continued to be a serious problem in post-revolution Egypt, social media has persistently played an important role in spreading political information (Freedom House, 2012; Breese & Harvin, 2013).

According to a 2013 study of Egyptian Twitter use, which analyzed 12 million Arabic tweets from February 2011 to June 2012, Egyptian Twitter users have shifted from looking back and reflecting on the January 2011 revolution to focusing on state institutions and elections. From February to November of 2011, 54% of tweets analyzed were “reflections on the revolution,” whereas from November until mid-January 2012 only 26% of tweets were about the uprising and the rest focused on the elections and state institutions (Breese & Harvin, 2013).

While this report paints an optimistic picture of Egyptians using social media to discuss formal democratic political participation, online networks are also increasingly used to achieve short-term political goals, manipulate public opinion, and even to incite violence (Omrani et al., 2013). In a recent interview, Al-Ahram Center for Strategic Studies social media expert Adel Abdel-Saddiq explained that “Social media now plays a more destructive role, often being used to provoke anger and hatred and spread unsubstantiated rumor....Since the revolution, we’ve seen it used to incite protesters against police, the Secular opposition against Islamist groups, and Muslims against Christians and vice versa” (Omrani et al., 2013 p. 2).

Since the July 2013 coup that ousted Egypt’s first democratically elected president Mohammed Morsi, and the ensuing crackdown on the Muslim Brotherhood, polarizing rhetoric has been on the rise both among elites and politically engaged Egyptians (Muasher et al., 2014 p. 1). In this increasingly tense political climate, Egyptians have witnessed widespread civil liberties violations and human rights abuses directed at Islamists and secular activists alike. The Muslim Brotherhood and most Islamist organizations have been excluded from politics, the media, and civil society (Dunne & Williamson, 2014). According to Wiki Thawra, an initiative of the Egyptian Center for Economic and Social Rights that has worked to compile comprehensive statistics on human rights abuses since the January 2011 revolution, between the time of the July 2013 coup that ousted Islamist President Mohamed Morsi and May 15, 2014, 36,478 Egyptians were detained or indicted for participating in political events, including protests. In the same period, another 1,714 were detained or indicted on terrorism charges (Dunne and Williamson, 2014). According to a June, 2014 statement by Human Rights Watch and Amnesty International, “Mounting reports of torture and other ill-treatment of detainees harken back to the most abusive periods under Hosni Mubarak.” Reports of citizens being “disappeared,” brutally tortured, or killed are particularly troubling (Human Rights Watch, 2014). Due to the large volume of detainees, the Egyptian judiciary has created special courts and held



mass trials including the death sentences handed down to 683 and 529 Islamist defendants in March and April 2014, respectively. Secular activists have also been targeted, such as the in absentia sentencing of Alaa Abdel-Fatah and 24 others, which prompted widespread outcry on social media. In this period, secular activists have also increasingly been jailed or accused of offenses including espionage, and some of their organizations, including the April 6th Youth movement, have been banned (Dunne & Wiliamson, 2014).

Mainstream media and political elite rhetoric has become increasingly intolerant in this period, often calling for the total exclusion of opponents from political and public life. In May 2014, for example, a representative from the official campaign of President Abdul Fatah al-Sisi called for the arrest of all Muslim Brotherhood members in Egypt on live television, asserting that those who do not love Egypt “should be hit with shoes”—a particularly derogatory act in Arab culture (Rollins, 2014). Similarly, in a recent satellite channel interview, prominent host Mohammed Moussa openly called for the arrest and execution of atheists and secularists, as part of a “war against destructive ideas” (Rollins, 2014).

In this political environment, social media rhetoric among political elites and politically engaged citizens has also become quite inflammatory. Among secular Egyptians, tweets calling for death sentences for Muslim Brotherhood leaders, decrying Islamists as terrorists, and proclaiming that they will never again return to power in Egypt or participate in politics have become increasingly common. On the Islamist side, tweets inciting violence or proclaiming that Egypt is for Islamists only have been on the rise.

Examining this trend more systematically, in the only published study of ideology in Egyptian Twitter networks, Weber et al. (2013) find evidence of increasing polarization among Egyptian Twitter users, with Islamist and Secular users each being more likely to retweet and mention users of the same ideology. They also find high congruence in hashtag use within each ideological group, though the effect is especially pronounced for Islamist users.

Despite these polarizing developments in Egyptian social media, during the June 2014 presidential elections, Egyptian politicians used social media to kick start their campaigns and many engaged citizens actively discussed the elections, policy platforms, and otherwise used Twitter as a means of political engagement and support for (quasi) democratic participation. Tweets documenting and denouncing regime civil liberties violations of both secular activists and Islamists are also currently quite common, indicating that Twitter has become a popular platform for voicing discontent with the regime in an extremely repressive environment.

Under these tense political circumstances in which political communication through social media has become increasingly widespread, the Egyptian Twittersphere provides an ideal setting for studying political tolerance and elite cues in a region of the world that has been largely neglected by both bodies of political science literature.

### 3 Theoretically Motivated Hypotheses

Applying the findings of the tolerance, elite cues, and cue-contact literatures to the context of the Egyptian Twittersphere motivates the three main hypotheses that I test in the remainder of this paper. These hypotheses (described below) all predict a positive relationship between the ideological diversity of a user’s Twitter network and his or her level of political tolerance, but they differ in the component of network diversity that each body of literature suggests may be driving this phenomenon.

#### **$H_1$ : Non-Elite Diverse Network Hypothesis**

Drawing on the traditional contact effect literature as well as more recent studies that find a positive relationship between network diversity and political tolerance (Allport, 1954; Mutz, 2002; 2006), I hypothesize that *Egyptian Twitter users with more ideologically diverse online networks of politically engaged citizens (or users that have higher levels of inter-group contact) will exhibit greater political tolerance than those in more homogenous networks*. Testing this hypothesis will determine whether or not the relationship between intergroup contact and political tolerance predicted by the political tolerance literature exists in this context, taking advantage of the detailed network data provided by the Egyptian Twittersphere.

#### **$H_2$ : Elite Cue Diversity Hypothesis**

Motivated by the elite cue literature, which posits that as citizens rely on trusted cues from elites they can either be mobilized in favor of or in opposition to the civil liberties of an out-group (Baumer et al., 2003; Stein, 2008; Dyck & Pearson-Merkowitz, 2006), I hypothesize that *users that follow a diverse group of elites on Twitter will be more tolerant than those that follow ideologically homogenous elites*. Testing this hypothesis will demonstrate whether or not the positive relationship between elite cue diversity and tolerance predicted in the elite-cue literature (see Stein, 2008) is present in the Egyptian context.

#### **$H_3$ : Elite Cue-Contact Hypothesis**

Finally, drawing on studies of the effect of the interaction between elite cues and intergroup contact on tolerance (Dyck & Pearson-Merkowitz, 2014), I hypothesize that *the relationship between network diversity and political tolerance will be moderated by the ideological heterogeneity of the elite cues to which a user is exposed*. For example, for users who have diverse networks of friends<sup>4</sup> and also follow ideologically heterogeneous elites, the effect of network diversity on tolerance will be

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<sup>4</sup>Following Twitter conventions, for the remainder of the paper “friends“ can be defined as the users that a given person chooses to follow on Twitter. Followers, by contrast, are users that follow that person on Twitter.

even greater than for users who have diverse non-elite networks but are not exposed to elite cues or only receive cues from elites in one ideological camp. By contrast, for users that have diverse friend networks but only follow Islamist (or Secular) elites, the relationship between network diversity and tolerance will be weaker than that observed for users who have diverse friends and elites in their Twitter networks. Testing this hypothesis will enable me to assess whether the interaction of elite cues and intergroup contact is a better predictor of political tolerance than intergroup contact or exposure to elite cues alone, as the cue-contact literature would suggest.

## 4 Measurement, Data, and Empirical Framework

In order to test the hypotheses outlined in Section 2, in this section I operationalize and define the variables, measurement techniques, and estimation strategies that I employ in the remainder of this paper using Egyptian Twitter data.

### Measuring Political Tolerance

As mentioned in Section 2, political tolerance is traditionally defined in the political science literature as the degree to which citizens will support the extension of civil liberties to political rivals, including groups advocating highly disagreeable viewpoints and ideologies. Similarly, political intolerance is understood to be a form of exceptionalism in which the political freedoms of particular groups and ideologies are targeted (Gibson, 2013). More specifically, political tolerance is what Gibson calls “support for institutional guarantees for political opposition” or disapproval of state actions that limit opportunities for citizens individually or in groups to compete for political power. Such opportunities include the right to vote, to participate in political parties, and to organize politically; as well as the right to free speech, trial, assembly, and other basic civil rights (Gibson, 2013; Sullivan et al., 1978; McClosky, 1964; Prothro & Grigg, 1960). Thus, political tolerance means putting up with that with which one disagrees and allowing one’s political enemies to compete openly for political power. A tolerant citizen is one who would not support unreasonable or discriminatory governmental restrictions on the rights of a political rival to participate in politics (Gibson & Gouwes, 2005).

The three main approaches to measuring political tolerance (and intolerance) advanced since 1980 use survey questions that ask whether political activities should be allowed for members of a specific out-group (fixed group approach); whether political activities should be allowed for members of a group that the respondent reports liking “least” (least liked approach); and whether people approve of policies that would limit civil liberties generally (Stouffer, 1980; Sullivan et al., 1982; Gibson & Gouws, 2003; Hinckley, 2010; Petersen et al., 2011; Sullivan & Hendriks, 2009). Recent empirical tests of these three measures of political tolerance indicate that knowing that an

individual supports or opposes repressive public policies *in general* does not necessarily predict very much about whether he or she would support extending basic civil liberties to a specific out-group. (Gibson, 2013).

Along these lines, a crucial aspect of the definition of tolerance is the so-called “objection precondition,” which states that political tolerance is the restraint of the urge to repress ones political enemies. For example, in the American context, Democrats cannot be said to “tolerate” other Democrats (because they are both members of the same political group), but they may or may not tolerate Republicans (their primary political competitors). Political tolerance therefore refers to allowing political activity by one’s political rivals (Gibson, 2006). In light of this objection precondition, Sullivan et al.(2009) note that measuring tolerance requires a two-step procedure: First, researchers must establish that an individual dislikes or is in competition with another political group. Then they need to measure the extent to which the individual supports or opposes the political rights of that group.

Building upon these traditional measurement strategies, in this paper I first operationalize a user’s political tolerance by measuring the number of his or her recent tweets<sup>5</sup> that favor extending civil liberties to an out-group as well as the number of tweets that oppose civil liberties for out-group members. I then define each users tolerance as: *User’s Tolerance = Tolerant Tweets – Intolerant Tweets*.

## Measuring Ideology on Twitter

In order to account for the aforementioned “objection precondition” in determining whether or not a given user’s tweets are tolerant or intolerant, I must first identify the ideology of each member of my sample. Because the current political rivalry in Egypt centers on the divide between Islamists and Secularists, this allows me to ascertain whether Islamists or Secularists represent the out-group or political rival for a given individual. Past studies of ideology in Twitter networks indicate that it is indeed possible to estimate the ideology of Twitter users based on the political elites that they choose to follow (Barberá, 2013; Halberstam & Knight, 2014). In fact, Barberá (2013) argues, the decision to follow a politician or political account on Twitter can be considered a “costly signal” that provides information about a Twitter user’s perception of both his or her ideological position and that of the political accounts he or she follows. This finding is grounded in the assumption that Twitter users prefer to follow accounts that share their ideology, an assumption motivated by the well-documented finding that social networks are homophilic (McPherson et al., 2001) and individuals therefore gravitate towards those with similar traits. Barberá (2013) argues that since Twitter is also a news media, homophily is reinforced by “selective exposure” to sources of information biased in the same direction as each user. As he explains, “Drawing an analogy

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<sup>5</sup>Tweets that are relevant to civil liberties and occur after the July, 2013 coup that ousted President Mohamed Morsi as described in detail in the Ideology, Network Diversity, and Elite Cue Diversity Data section below.

with offline behavior, this argument would be equivalent to using the choice of sources of political information voters make as a proxy for their political preference”(p. 3). In this way, just as Americans who gain the majority of their political information from Fox News are highly likely to lean Republican, Americans who follow Republican political elites on Twitter are quite likely to be supporters of the GOP (Halberstam & Knight, 2014).

Borrowing from Halberstam and Knight (2014), I therefore measure the ideology of the users in my sample based on the politicians and political elites that they follow on Twitter.<sup>6</sup> In order to do this, I chose a list of the top 85 Egyptian political elites who have well known political affiliations and the most followers on Twitter. I then use the political affiliation (Islamist or Secular) of these elites to infer the ideology of the Twitter user. In particular, I classify users as Islamist if 60% or more of the political elites they follow are Islamist, users as Secular if 60% or more of the political elites they follow are Secular, and users as Moderates if 40 to 60% of the elites they follow are either Islamist or Secular.<sup>7</sup> Because the elites that I have chosen are by definition Secular or Islamist, my definitions of Secular, Islamist, and Moderate Egyptian Twitter users are exclusive, allowing me to code the ideology of each member of my sample.<sup>8</sup>

## Measuring Twitter Users’ Network Diversity and Elite Cue Diversity

I measure network diversity as the proportion of friends with the same ideology in a user’s Twitter network. This means that the only friends in a user’s network that I evaluate are those who follow at least one political elite, as otherwise their ideology cannot be classified. I call these friends *politically engaged non-elites*.<sup>9</sup> Users with the least diverse (most homogenous) networks, that have a diversity score of 0, will have only Islamist or Secular friends; whereas those in completely diverse networks (most heterogeneous) will have an even proportion of Islamist and Secular friends and have a diversity score of 1. In order for my network diversity measure to appear greater for those with more diverse networks I calculate network diversity as:

$$Network\ Diversity = 1 - abs\ (Proportion\ Secular\ Friends - Proportion\ Islamist\ Friends)$$

Again, users are considered “Islamist Friends” if 60% or more of the elites they follow are Islamist, and “Secular Friends” if 60% or more of the elites they follow are Secular.

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<sup>6</sup>See Table 5 in Appendix for the complete list.

<sup>7</sup>I chose the 60% cut-off point because upon examining the networks of 100 politically engaged Egyptians on Twitter (whose ideology could be easily determined based on the content of their tweets), this threshold consistently appeared to predict ideology quite accurately. Upon performing a robustness check, I found that raising or lowering these percentages by up to 5 percentage points does not substantively change results of this paper.

<sup>8</sup>4% of my sample (or 38 people) do not follow any elites and therefore their ideology cannot be classified. I exclude them from my analysis for this reason.

<sup>9</sup>Among members of my sample, the mean percentage of politically engaged non-elites in their non-elite networks is 61%. This is calculated by dividing politically engaged non-elites by total non-elites in a sample member’s network. See the Appendix for a complete distribution of this proportion for all members of my sample’s networks.

I also put forth a second measurement of network diversity that makes the diversity score higher for those users who have larger numbers of “Moderate Friends” or friends for whom more than 40% and less than 60% of the elites they follow are either Secular or Islamist. In this way I account for exposure to Secular, Islamist, and Moderate opinions. This measure is also on a 0-1 continuous scale measured as:

$$\text{Network Diversity} = ((1 - (\text{abs}(\text{Proportion Secular Friends} - \text{Proportion Islamist Friends})) + \text{Proportion Moderate Friends})) / 2$$

I define elite cue diversity as the ideological diversity of elite cues that a user is exposed to. This can be measured as “elite network diversity” drawing on the first measure of network diversity described above:

$$\text{Elite Cue Diversity} = 1 - \text{abs}(\text{Proportion Secular Elite Friends} - \text{Proportion Islamist Elite Friends})$$

In this way, users who follow a relatively comparable number of Islamist and Secular elites will have an elite cue diversity score of close to 1, whereas those who follow almost exclusively Islamist or Secular elites will have an Elite Cue Diversity score of closer to 0.

As Figures 1 and 2 below indicate, there is a great deal of variation in the diversity of elite and non-elite friend networks that the members of my sample have cultivated on Twitter. Both the distributions of diversity of elite cues and non-elite network diversity are bimodal, indicating that both Islamist and Secular Egyptians tend to form Twitter networks that reflect their ideological views. This is consistent with findings in the Internet and politics literature, which suggest that much like face-to-face political communications among friends or coworkers, Twitter networks exhibit a significant degree of homophily—links are more likely to develop between individuals with similar ideological preferences (Gentzkow & Shapiro, 2011; Halberstam & Knight, 2014).

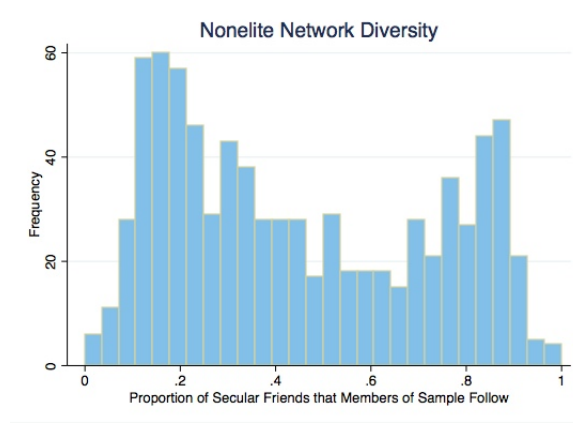


Figure 1: This figure plots the distribution of the proportion of Secular politically engaged non-elite friends in the network of each sample member. This is calculated as the number of Secular politically engaged non-elites in a sample member’s network divided by the total number of politically engaged non-elites in that user’s network. “Frequency” is the frequency with which this proportion appears in the sample. The distribution appears identical but flipped horizontally when calculating the same proportion of *Islamist* politically-engaged non-elite friends in each sample member’s network.

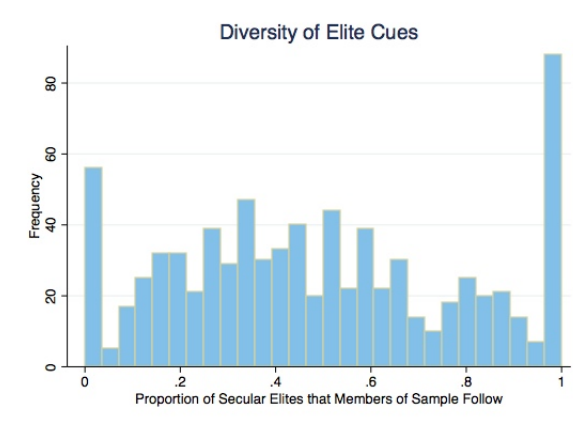


Figure 2: This figure plots the distribution of the proportion of Secular elites in the network of each sample member. This is calculated as the number of Secular elites in a sample member’s network divided by the total number of elites that each member follows. “Frequency” is the frequency with which this proportion appears in the sample. The distribution appears identical but flipped horizontally when calculating the same proportion of *Islamist* elites in each sample member’s elite network.

## Choosing a Sample of Politically Engaged Egyptian Twitter Users

Because tolerance can only be measured for Egyptian Twitter users who actually tweet about civil liberties, I began by taking a sample of 1500 Twitter users who had tweeted about Egyptian civil liberties in Arabic from a dataset of Arabic tweets broadly related to Egyptian news and politics that I began collecting using tools developed by NYU’s Social Media and Political Participation Lab in January, 2014. I found tweets that were relevant to civil liberties in Egypt by searching the

dataset for tweets that included one or more Arabic civil liberties keywords.<sup>10</sup> The 1500 person sample that I selected randomly from a list of users who had tweeted about civil liberties in Egypt included many people who were not Egyptian or whose accounts had become private or inactive since their tweets were gathered in my dataset. I therefore filtered out private and inactive users and used each user’s reported location and Twitter biographies to remove any people from the sample who were not Egyptian. This left me with a sample of 838 Egyptians who had tweeted about civil liberties in Egypt between January and August 2014.

## **Ideology, Network Diversity, and Elite Cue Diversity Data**

In order to measure the ideology of each person in my sample and the ideology of each of their friends, I began by choosing a list of Egyptian political elites that have large social media followings and can be easily classified as Islamist or Secular based on their well known political affiliations. I chose these elites by using Twitter Counter, a site that tracks statistics for over 94 million Twitter users worldwide, to rank Egyptian Twitter users by their follower numbers. This allowed me to compile a list of all Egyptian politicians and political movements that have over 10,000 followers on Twitter and well-known political affiliations, resulting in a list of 85 Egyptian political elite users who are popular on Twitter.<sup>11</sup> Forty-four of these elites are Secular and 41 are Islamist. I then used R and Python packages developed by NYU’s Social Media and Political Participation Lab to collect a list of all followers for each elite user and a list of all friends of each person in my sample.<sup>12</sup> This enabled me to measure networks for each member of my sample of all of the elites and politically engaged non-elites they follow, as well as to measure the ideology of every politically engaged non-elite friend in each of these networks. With this data, I calculated each person’s non-elite network diversity as well as their elite cue diversity as described above. Figures 3 and 4 below show the distributions of elite cue volume, and politically engaged friends for the members of my sample.<sup>13</sup> They demonstrate that there is a great deal of variation in the number of political elites and politically engaged non-elites that each member of the sample follows—ranging from zero all the way to 58 political elites and almost 4000 non-elite politically engaged friends.

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<sup>10</sup>See Figure 9 in Appendix for a complete list.

<sup>11</sup>See Table 5 in Appendix for Complete List.

<sup>12</sup>Collecting the complete list of followers for each elite allowed me to cross-reference these lists with the lists of “friends” of each member of my sample, enabling me to measure the ideology of each “friend” in my sample members’ networks.

<sup>13</sup>See Figure 10 in Appendix for Distribution of Secular, Islamist, and Moderate users in sample.



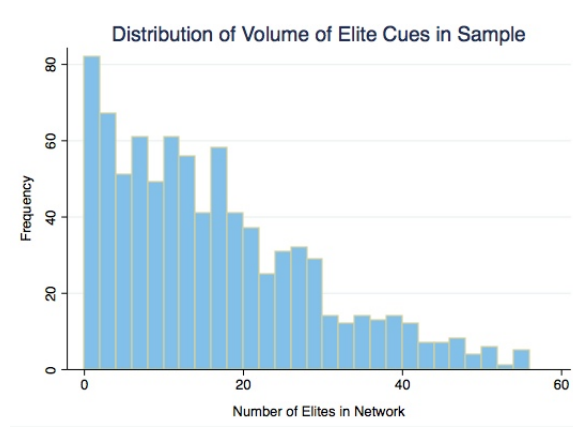


Figure 3: Frequency refers to the frequency with which members of the sample follow a given number of elites.

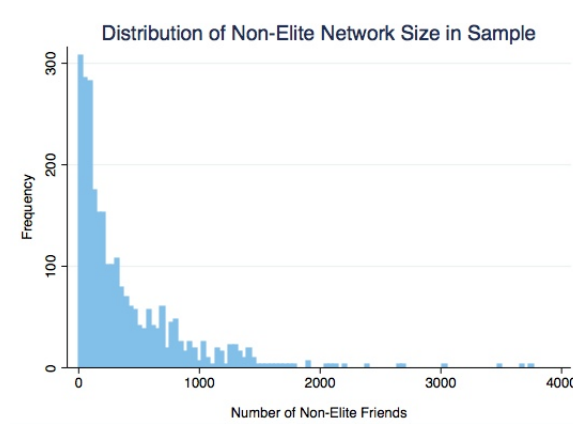


Figure 4: Frequency refers to the frequency with which members of the sample follow a given number of non-elites.

## Using Student Coders, Crowdsourcing, and Machine-Learning to Code Tweets

In order to determine levels of political tolerance, I developed a coding system to assess whether a tweet supports or opposes extending civil liberties to Islamists, Secularists, or Egyptians in general. The coding system is as follows:

- 1= Tweets that promote civil liberties and rights for Islamists
- 2= Tweets that promote civil liberties and rights for Secularists (non-Islamists)
- 3= Tweets that promote civil liberties and rights in general (for all Egyptians or groups of Egyptians that may include both Islamists and non-Islamists)
- 4= Tweets that support restricting the civil liberties and rights of Islamists
- 5= Tweets that support restricting the civil liberties and rights of Secularists (non-Islamists)
- 6= Tweets that support restricting civil liberties and rights in general (for groups that include both Islamists & non-Islamists)

Under this system, tweets that promote civil liberties include those that oppose: unfair trials, unlawful detentions, arbitrary arrests, death sentences, torture, censorship, limitations on free speech or assembly, excluding any group from participating in government, electoral fraud, police or military violence against civilians, and banning political parties, NGOs, or other civil society organizations. Tweets that promote civil liberties also include those that call for freedom, democracy, human rights, and an end to discriminatory or exclusionary policies. By contrast, tweets that support restricting civil liberties include those that favor civilian arrests, death sentences, or torture; those limiting the right to free speech, protest, or assembly; and tweets advocating banning political parties or excluding certain groups from formal or informal political participation.<sup>14</sup>

In order to initially assess the viability and reliability of this coding scheme, I first assembled a group of four native Arabic-speaking NYU Abu Dhabi student volunteers to code approximately 300 tweets that were relevant to civil liberties in Egypt according to the instructions above. I then calculated the sentiment confidence for coding of each tweet as the number of coders who chose the dominant (or most popular) coding category divided by the total number of coders:

$$\text{Coders Choosing Dominant Sentiment Category} / \text{Total Coders}$$

The average sentiment confidence for each tweet was 88%, indicating that my coding system can be used to reliably place tweets into the six categories mentioned above.

Having established that these tweets could be effectively coded by native Arabic-speaking college students at NYU Abu Dhabi, I then tested whether or not these tweets could be reliably coded through crowdsourcing. This entails outsourcing the coding of tweets to an undefined large group of people via online microtasking, in which each contributor codes a small number of tweets in return for small compensation. Using CrowdFlower, a data enrichment platform that allows a researcher to launch microtasks to a “crowd” of over five million contributors, I launched the 300 tweets that I had given to the NYU Abu Dhabi volunteers to be coded by the “crowd.” CrowdFlower enabled me to use test questions for quality control to ensure that the contributors coding tweets were responding to tasks truthfully and conscientiously. If a contributor answered a certain percentage of test questions incorrectly, that contributor was removed from the job and their data was erased. This enabled me to ensure that the members of the “crowd” coding my tweets were fluent in Arabic and understood the task at hand. Each of the 300 tweets was coded by three CrowdFlower users. The average sentiment confidence, measured the same way I measured sentiment confidence for the tweets coded by NYUAD users but also weighting contributor responses by how “trusted” users were given their percentage of correct answers to test questions, was 84%. This gave me confidence that while perhaps not quite as reliable as elite native Arabic speaking college students, members of the “crowd” could still code tweets quite consistently.

Because of cost limitations, I decided to select the 50 most recent tweets that were relevant to civil liberties from each user in my sample between July, 2013 and August, 2014. I did not look at

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<sup>14</sup>See Figure 11 in the Appendix for examples of tweets in each of the six categories of the coding system.

tweets from before July, 2013 because I wanted to ensure that all tweets occur in a similar political climate—that is after the coup that ousted former President Mohammed Morsi. Because I only examine up to 50 relevant tweets for each user, it was very important to ascertain that the selected tweets were actually relevant. Moving beyond simply using keywords to classify relevance, I worked with Jonathan Ronen, a computer scientist in the NYU Social Media and Political Participation Lab, to develop a machine-learning algorithm to classify tweets as relevant or irrelevant to civil liberties in Egypt.

Using the tweets coded by both the NYU Abu Dhabi and CrowdFlower contributors as well as randomly selected tweets from users in my sample that had been coded in CrowdFlower as a training dataset, we were able to develop an accurate machine-learning algorithm for classifying the relevance of tweets. This was done by first converting words in the tweets to their roots using the Information Science Research Institute “Arabic Stemming Without a Root Dictionary” stemmer (Taghva, Elkoury & Coombs, 2005). Then, using word count vectors from the training dataset, we trained a Naive Bayes classifier to predict whether or not a tweet was relevant. This algorithm was able to predict relevance with 75% accuracy. Accuracy was measured as an F1-score or a harmonic mean of precision and accuracy, in which  $precision = (true\ positives) / (true\ positives + false\ positives)$ , and recall, where  $recall = (true\ positives) / (true\ positives + false\ negatives)$ .

Using this machine-learning algorithm, I then compiled a list of up to 50 tweets for each user in my sample that were predicted to be relevant and uploaded them to be coded by CrowdFlower contributors. According to the CrowdFlower results, 81% of the tweets that the machine-learning algorithm predicted to be relevant were coded as relevant by the “crowd.” This indicates that the machine-learning algorithm was in fact quite successful at classifying tweets—perhaps even more so than the F1-score predicts. The machine-learning algorithm therefore allowed me to substantially reduce the costs of coding tweets for the members of my sample by enabling me to identify relevant tweets. While human coders ultimately provided “quality control” by determining whether or not these tweets were actually relevant, the machine learning algorithm provided me with a list of likely-relevant tweets for each member of my sample. This enabled me to avoid wasting a great deal of time and money by coding hundreds or even thousands of irrelevant tweets that each member of my sample had tweeted recently.

Before measuring the number of tolerant and intolerant tweets for each member of my sample in order to calculate tolerance, I removed all irrelevant tweets and tweets with less than 70% sentiment confidence from the dataset in order to ensure a high level of confidence in the coding of the tweets. The mean number of confidently coded relevant tweets for each user in my sample is 21 tweets, and the average sentiment confidence for these tweets is 83%.<sup>15</sup>

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<sup>15</sup>See Figure 12 in the Appendix for a distribution of the number of relevant tweets per user.

## Empirical Framework

Borrowing from the estimation techniques employed by past studies that empirically test the contact hypotheses, I first develop a simple model to assess whether users that have contact with more ideologically diverse politically engaged friends on Twitter exhibit greater tolerance. I additionally include a network size variable, which controls for how many politically engaged friends a given user follows. I chose to include this variable in the model because some political tolerance studies find that simply having a larger political communication network is sufficient to increase tolerance (see Gibson, 2001). Here Network Size is measured as *log(number of politically engaged friends)*. I also added an Islamist dummy variable where 0 is a user who follows less than 60% Islamist elites and 1 is a user who follows 60% or more Islamist elites. This is included in order to ascertain whether ideology, in addition to network diversity, has an impact on tolerance in Egypt’s current political climate in which Islamists are being disproportionately targeted by the regime. Finally, I include a variable measuring the number of tweets that are generally supportive of civil liberties (Code 3) that a user tweets as well as a variable for the number of tweets that generally oppose civil liberties (Code 6). I include these variables following existing studies of tolerance that include a “general support for abstract democratic norms” control (see Bloom & Bagno-Moldavsky, 2014). Past studies indicate that while general support for (or opposition to) civil liberties cannot be used as an accurate measure of support for extending liberties to an out-group, there is often some correlation between these measures (Gibson, 2013).<sup>16</sup> If my Network Diversity Hypothesis holds, we should expect to see a positive  $\beta_1$  coefficient on Network Diversity in Model 1 below.

### Model 1: Testing the Network Diversity Hypothesis ( $H_1$ )

$$\begin{aligned} \text{Tolerance} = & \beta_0 + \beta_1 \text{Network Diversity} + \beta_2 \text{Network Size} + \beta_3 \text{Islamist} \\ & + \beta_4 \text{General Support for Civil Liberties} + \beta_5 \text{General Opposition to Civil Liberties} + \epsilon \end{aligned}$$

In the second model, motivated by elite cue theories (Baumer et al., 2003; Stein, 2008), I assess the degree to which exposure to diverse elite cues predicts higher levels of tolerance. This can be modeled very similarly to Model 1, and I again include controls for Islamist ideology and general support for and opposition to civil liberties as well as an “elite cue volume” control, measured as *log(the total number of elites a user follows)*. If exposure to diverse elite cues indeed predicts higher tolerance levels, we should again expect to see a positive  $\beta_1$  coefficient on Elite Cue Diversity in the model below:

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<sup>16</sup>When the General Support for Civil Liberties and General Opposition to Civil Liberties variables are removed from all three models, the findings outlined in the results section are still robust as neither the significance nor the magnitude of the effects change meaningfully. This indicates that these two variables are not simply putting “tolerance” on both sides of the equation and driving the results discussed in the subsequent section.

### Model 2: Testing the Elite Cue Hypothesis ( $H_2$ )

$$\begin{aligned} \text{Tolerance} = & \beta_0 + \beta_1 \text{Elite Cue Diversity} + \beta_2 \text{Elite Cue Volume} + \beta_3 \text{Islamist} \\ & + \beta_4 \text{General Support for Civil Liberties} + \beta_5 \text{General Opposition to Civil Liberties} + \epsilon \end{aligned}$$

In my third model, motivated by the elite cue-contact literature (Dyck & Pearson-Merkowitz, 2014), I measure the extent to which any relationship between network diversity and tolerance may be moderated by the diversity of elite cues to which a given user is exposed. The simplest way to measure this phenomenon is to interact the Network Diversity variable with the Elite Cue Diversity variable. In this model, I also control for Islamist ideology, general support for (and opposition to) civil liberties, and friend network size, as well as elite cue volume. If receiving diverse elite cues does in fact intensify the relationship between network diversity and tolerance, we should expect the  $\beta_3$  coefficient on the interaction term to be positive and greater in magnitude than the  $\beta_1$  and  $\beta_2$  coefficients, which measure the non-interacted relationships.

### Model 3: Testing the Cue-Contact Hypothesis ( $H_3$ )

$$\begin{aligned} \text{Tolerance} = & \beta_0 + \beta_1 \text{Network Diversity} + \beta_2 \text{Elite Cue Diversity} \\ & + \beta_3 \text{Network Diversity} \times \text{Elite Cue Diversity} \\ & + \beta_4 \text{Islamist} + \beta_5 \text{Network Size} + \beta_6 \text{Elite Cue Volume} \\ & + \beta_7 \text{General Support for Civil Liberties} + \beta_8 \text{General Opposition to Civil Liberties} + \epsilon \end{aligned}$$

## 5 Results

### Non-Elite Network Diversity and Tolerance ( $H_1$ Results)

Table 2 below provides support for the Non-elite Diverse Network hypothesis, which posits that Egyptian Twitter users with more ideologically diverse online networks of politically engaged citizens will exhibit greater political tolerance than those in homogenous networks. Both measures of non-elite network diversity (including and excluding moderates) have positive and statistically significant effects on tolerance. When a user's moderate friends are included in the measure of network diversity, such that having more moderate friends makes a user's network diversity score higher, the effect is even greater.

Furthermore, as the tolerance literature on the relationship between general support for civil liberties and political tolerance of an out-group predicts (see Gibson, 2013), expressing general support for civil liberties has a small significant positive effect on political tolerance, whereas expressing general opposition toward civil liberties has a small significant negative effect, again using measures of non-elite network diversity that both include and exclude moderates. Furthermore,

being an Islamist has a significant negative effect on political tolerance toward an out-group. Given the stigmatized position of Islamists in Egypt today, perhaps Islamists are less likely to support civil liberties for Secular Egyptians.

Table 2: **Model 1 Results: Non-Elite Network Diversity and Tolerance**

	(1)	(2)
	Tolerance	Tolerance
Non-Elite Network Diversity (Including Moderate Friends)	3.886*** (0.690)	
Non-Elite Network Diversity (Not Including Moderate Friends)		2.142*** (0.427)
Islamist	-0.712** (0.220)	-0.560** (0.213)
General Support for Civil Liberties	0.0348*** (0.008)	0.0372*** (0.008)
General Opposition to Civil Liberties	-0.220*** (0.066)	-0.216** (0.066)
Log Number of Nonelite Friends	-0.092 (0.0760)	-0.116 (0.0761)
Constant	-1.060* (0.503)	-0.797 (0.495)
<i>N</i>	613	613

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Although there are 838 users in my sample, I can only classify 613 of them as Secular or Islamist because the rest are Moderates. Because I must be able to classify sample members as Islamist or Secular to measure their tolerance toward an outgroup, I do not include Moderates in my analysis.

Taken together, these results support the consensus in the political tolerance literature that there is a positive relationship between intergroup political communication and political tolerance.

## Elite Cue Diversity and Tolerance ( $H_2$ Results)

Table 3 below indicates that there is also significant support for the Elite Cue Diversity hypothesis, which predicts that users who follow diverse groups of elites on Twitter will be more tolerant of out-groups than those who follow ideologically homogenous elites. This is in line with findings in the elite cue literature, which suggest that exposure to diverse elite cues moves public opinion against policies that violate the rights of an out-group (see Stein, 2008). Elite Cue Diversity has a large and significant effect on a users tolerance. As in Model 1, General Support for Civil Liberties and General Opposition to Civil Liberties both have small but significant effects on tolerance—positive and negative, respectively. Interestingly, following a large number of elites (regardless of their ideological heterogeneity) has a significant negative effect on tolerance, perhaps indicating that following more elites is connected to intolerance as it may signify greater political polarization or stronger ties to a users in-group.

Table 3: **Model 2 Results: Elite Cue Diversity and Tolerance**

	(1) Tolerance
Elite Cue Diversity	2.464*** (0.415)
Islamist	-0.119 (0.182)
General Support for Civil Liberties	0.0281*** (0.008)
General Opposition to Civil Liberties	-0.229*** (0.065)
Log Number of Elite Friends	-0.430*** (0.115)
Constant	-0.346 (0.278)
$N$	613

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Although there are 838 users in my sample, I can only classify 613 of them as Secular or Islamist because the rest are Moderates. Because I must be able to classify sample members as Islamist or Secular to measure their tolerance toward an outgroup, I do not include Moderates in my analysis.

### Cue-Contact Diversity and Tolerance ( $H_3$ Results)

As Table 4 indicates, I did not find significant support for the Cue-Contact hypothesis, which predicts that the relationship between network diversity and political tolerance will be moderated by the ideological heterogeneity of the elite cues a user is exposed to. Using both measures of non-elite network diversity that include moderates and do not, while the Cue-Contact interaction term between Elite Cue Diversity and Non-Elite Network Diversity is in the expected direction, it is neither significant nor larger in magnitude than the non-interacted terms as the Cue-Contact hypothesis predicts.

Table 4: **Model 3 Results: Cue-Contact Diversity and Tolerance**

	(1)	(2)
	Tolerance	Tolerance
Elite Cue Diversity	1.635 (0.897)	1.783* (0.852)
Non-Elite Network Diversity (Including Moderate Friends)	2.750** (1.017)	
Non-Elite Network Diversity (Not Including Moderate Friends)		1.417* (0.666)
Interaction Effect		
Cue-Contact Network Diversity (Including Moderate Friends)	0.623 (2.128)	
Interaction Effect		
Cue-Contact Network Diversity (Not Including Moderate Friends)		0.286 (1.353)
Islamist	-0.637** (0.219)	-0.500* (0.211)
General Support for Civil Liberties	0.0330*** (0.00817)	0.0345*** (0.00827)
General Opposition to Civil Liberties	-0.225*** (0.0652)	-0.221*** (0.0655)
Log Number of Elite Friends	-0.316* (0.130)	-0.307* (0.131)
Log Number of Non-Elite Friends	-0.0551 (0.0848)	-0.0801 (0.0847)
Constant	-0.860 (0.550)	-0.639 (0.540)
$N$	613	613

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Although there are 838 users in my sample, I can only classify 613 of them as Secular or Islamist because the rest are Moderates. Because I must be able to classify sample members as Islamist or Secular to measure their tolerance toward an outgroup, I do not include Moderates in my analysis.



The absence of an interaction effect is noteworthy and deserves further investigation. It perhaps suggests that the relationship between elite cues and network diversity may differ in online and off-line settings. On Twitter, people follow elites and non-elites on the same platform. In their offline lives, on the other hand, people tend to receive elite cues from more reputable or official sources, whereas non-elite intergroup contact tends to occur more casually. This might mean that elite cues no longer play such an important role in moderating non-elite contact in the online sphere. It is also possible, however, that because elite network diversity and non-elite network diversity are moderately correlated in my sample (the correlation coefficient is significant and equal to .37) it is simply not possible to observe any interaction effects in this particular analysis.

These three sets of results indicate that while both elite cues and non-elite network diversity are important determinants of tolerance, the types of elite cues a user is exposed to do not necessarily moderate the effect of following diverse politically engaged non-elites on Twitter as the cue-contact literature would predict.

## 6 Endogeneity Problems and Identifying a Causal Effect

Although these results appear to confirm two of my three hypotheses, they may suffer from the same types of endogeneity concerns that are present in many tolerance studies (Ihlanfeldt, 2002; Lewis, 2011; Skipworth et al., 2010; Dyck & Pearson-Merkowitz, 2014). In particular, any measure of network diversity may be plagued by the problem that individual Twitter users who are more tolerant and receptive to alternative political views may more actively seek out and follow Twitter users across the ideological spectrum, self-selecting into diverse networks. Conversely, individuals with more negative attitudes towards out-groups may avoid contact with these groups altogether and only follow like-minded elites and politically engaged friends. If this is the case, any relationships that I observe when testing these hypotheses may be picking up a type of “reverse causation,” rather than estimating the direct effect of network diversity on tolerance (Dyck & Pearson-Merkowitz, 2014).

In truth, it is likely that a user’s existing level of tolerance or intolerance at the time he or she joins Twitter drives self-selection into more diverse or homogenous networks, and spending time in such networks then may magnify this effect. If this is the case, what we observe on Twitter in a given point in time may be an equilibrium outcome of these endogenous and exogenous processes.

While many studies of the effect of network diversity on tolerance skirt this endogeneity issue by avoiding causal claims all together (see discussion in Gibson, 2001), Twitter data may provide a unique means of beginning to confront endogeneity concerns. At the simplest level, by accounting for the amount of time a user has been on Twitter—or how long he or she have been exposed to intergroup political communication through a given network—we can begin to assess whether or not Twitter network diversity has any direct effect on political tolerance. While citizens who are

already more tolerant may be more likely to self-select into more diverse networks, if spending more time in an ideologically diverse Twitter network increases the effect of these different measures of network diversity on a user’s tolerance, we may be able to gain a better of understanding of any causal relationship that may exist.

In order to assess the manner in which time spent in a diverse or homogenous network on Twitter may influence the effect of network diversity on tolerance, I conduct a dose-response analysis in which the outcome variable is tolerance, the treatment is nonrandom assignment to a diverse network, and the level of the dose is the time a user has spent on Twitter.

Following Cerulli’s (2012) strategy for estimating dose response treatment models under continuous treatment endogeneity and heterogeneous response to observable confounders, spending time in a diverse Twitter network can be understood as the nonrandom assignment of a binary treatment where the treatment is provided at different “levels” (or dose  $t$ ) to treated users from zero (absence of treatment) to a maximum treatment level. For those users who are “untreated” or in homogenous networks, the level of treatment or “dose” is zero; while for those users who are “treated” or in diverse networks, the level of treatment is greater than zero according to the time each user has spent on Twitter.

A dose response function can then be used to estimate the causal effect of the treatment variable  $t$  on an outcome  $y$  by assuming that treated and untreated units may respond differently to observable confounders ( $\mathbf{x}$ ). I therefore estimate a dose response function where  $y$  is tolerance, and  $w = 1$  is nonrandom assignment to a diverse network in order to gain more insight into the effects measured by Models 1, 2, and 3. Here,  $w = 0$  is nonrandom assignment to a homogenous network, and  $t$  is the level of treatment a user has been exposed to given the amount of time (if any) he or she has spent in a diverse network. The dose response function is the Average Treatment Effect (ATE) given the level of treatment  $t$  or  $ATE(t)$ , which is obtained by averaging  $ATE(\mathbf{x}, t)$  or the idiosyncratic ATE on  $\mathbf{x}$ . This can be modeled as:  $ATE ( t , w ) = E_x \{ ATE ( \mathbf{x} , t , w ) \}$

In order to estimate dose response functions for exposure to diverse elite cues and exposure to network diversity, I use the STATA routine “ctreatreg” (Cerulli, 2012). Because, as Figure 5 indicates, there is a great deal of variation in the amount of time users in my sample have spent on Twitter since their first tweets, ranging from approximately one month to seven years,<sup>17</sup> dose response analysis provides potentially useful insight into the manner in which time on Twitter influences the significant relationships between elite cue diversity, network diversity, and tolerance described above.

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<sup>17</sup>39 days to 2738 days

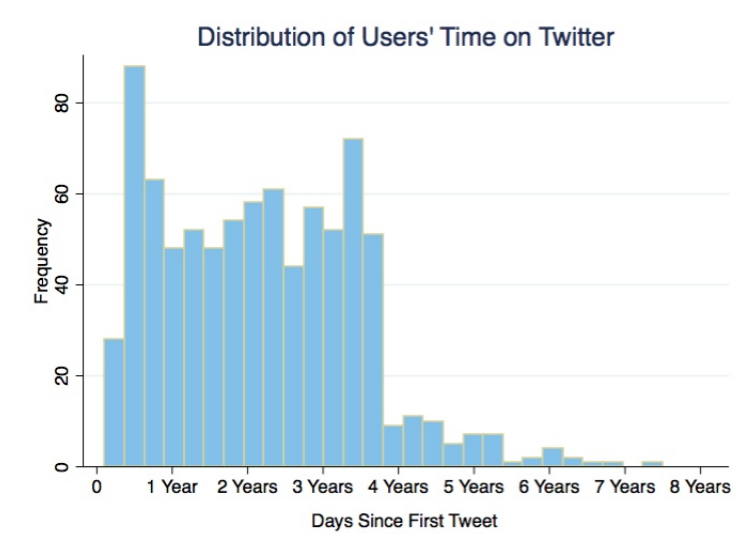


Figure 5: Frequency refers to the frequency with which an amount of Time on Twitter (number of days since first tweet) appears in the sample.

Figures 6 and 7 below were produced by the `ctreatreg` STATA module for estimating dose response treatment models under (continuous) treatment endogeneity and heterogeneous response to observable confounders. They demonstrate that the relationship between elite cues, network diversity, and time on Twitter do in fact vary by the amount of time a user has spent in a diverse Twitter network. The effect of network diversity on tolerance and the effect of elite cue diversity on tolerance both only become positive for users that have spent about four months on Twitter. Additionally, the effect is particularly large in magnitude for users that have spent over four years on Twitter, as demonstrated by the upward tail visible in both graphs.

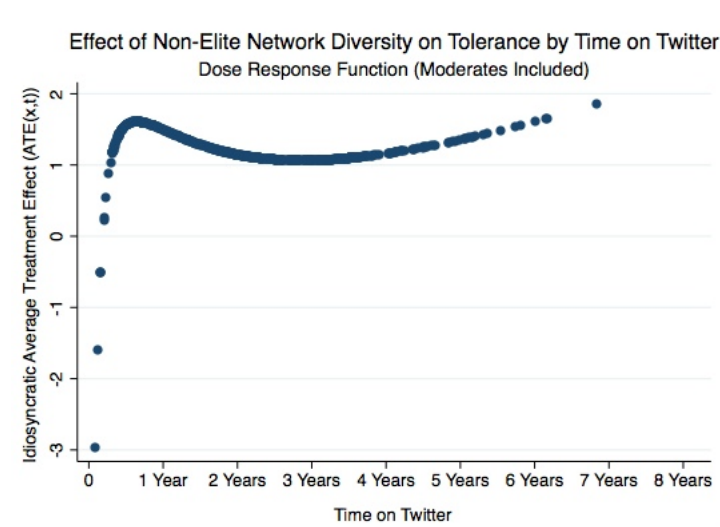


Figure 6: The Y-axis represents the Idiosyncratic Average Treatment Effect or the effect of network diversity on tolerance after having been on Twitter for a given amount of time. The curve looks very similar using the measure of Non-Elite Network Diversity that does not include moderates, which is included in Figure 13 in the Appendix.

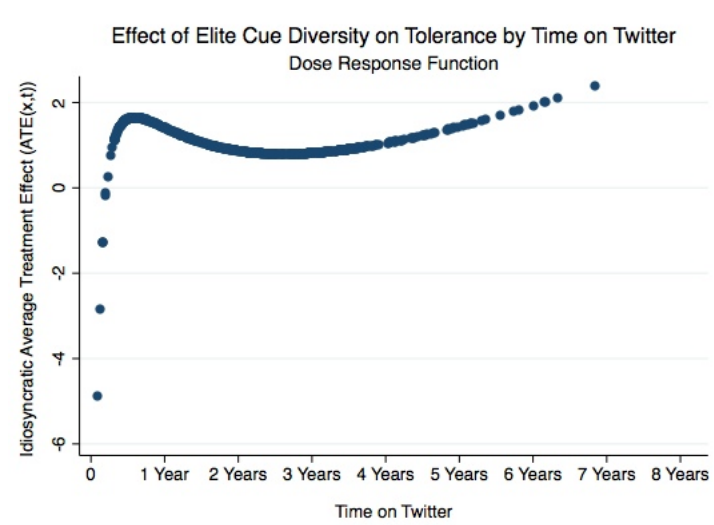


Figure 7: The Y-axis represents the Idiosyncratic Average Treatment Effect or the effect of elite cue diversity on tolerance after having been on Twitter for a given amount of time.

The fact that the positive effect of both non-elite network diversity and elite cue diversity on political tolerance is not present for users that have been on Twitter for less than four months could indicate that the composition of a users elite and non-elite Twitter networks is having a direct, causal effect on tolerance—an effect that becomes particularly large in magnitude after several years on Twitter. An alternative explanation, however, is that users take time to self-select into the networks that best reflect their ideological positions. If this is the case, perhaps we are in fact observing a process of equilibration as users pre-Twitter levels of tolerance drive the diversity of the networks they cultivate, and this effect becomes more pronounced as time spent in a diverse network makes a user even more tolerant. The apparent four-month delay in the effect of network diversity on tolerance may also be driven by the fact that users could first choose to follow elites and non-elites that share their ideology and even tolerant users take some degree of time to expose themselves to diverse users.

In this way, while these dose-response analyses do not fully deal with the endogeneity problem described in Section 4, they do indicate that spending time in diverse elite and non-elite networks on Twitter seems to increase a user’s tolerance to some degree—even if that user self-selects into a more tolerant network because they are more already more tolerant of the out-group before joining Twitter.

## 7 Conclusions and Steps for Further Research

The results detailed in Section 5 suggest that there are significant relationships between non-elite network diversity and political tolerance as well as elite cue diversity and political tolerance in the Egyptian Twittersphere. While it is unlikely that network diversity (on or offline) is the only

force driving tolerance, it may still play an important role at the margins. Although tolerant people may be more likely to self-select into diverse networks, there are many factors that influence whom individuals choose to follow on Twitter. From connecting with acquaintances and interacting with celebrities or public figures, to gaining news and political information (Deller, 2011), tolerance is almost certainly not the only factor that drives individuals as they cultivate their Twitter networks. In this way, network diversity is not simply a second measure of tolerance, and these results are not achieved by just putting a tolerance variable on each side of a regression equation.

More specifically, although the dose-response analysis in Section 6 does not fully resolve these endogeneity concerns, it provides suggestive evidence that spending time in diverse online networks may in fact make a user more tolerant over time. The effect of network diversity on tolerance is only positive for users who have spent several months on Twitter, and the magnitude of the effect is particularly great for those members of my sample who have spent over four years in a diverse Twitter network. While collecting more data and studying changes in users' tolerance levels and network diversity over time would better allow for causal identification of this effect, the results of the dose response analysis provide tentative support.

Taken together, these results indicate that the structure of Twitter users' communication networks vary dramatically based on the "tweeps" they choose to follow, and could have important implications for political tolerance. By changing the political communication network to which a user is exposed, cultivating a diverse (or homogenous) network may have repercussions for attitudes toward out-groups—especially in Egypt's current polarized political climate. As a step for future research, replicating this analysis with another random sample of Egyptian Twitter users and studying this phenomenon in other countries with constrained media environments could also provide further support for these initial results.

By finding support for both the Diverse Network Hypothesis ( $H_1$ ) and Elite Cues Hypothesis ( $H_2$ ) in a region of the world largely neglected by the elite cues and political tolerance literatures, using the architecture of Twitter to develop a much more detailed picture of elite and non-elite political communication networks than traditional survey methods allow, this paper provides a key contribution. Additionally, the dose-response analysis offers insight into the short and long term effects of online social networks on political behavior, a phenomenon that has been underexplored in the burgeoning Internet and politics literature.

In the vast majority of studies to date, social scientists have been seriously limited in their ability to comprehensively map and characterize networks in people's lives (see Gibson, 2001; Bloom, & Bagno-Moldavsky, 2014). The challenge of accurately measuring a network completely has forced researchers to either rely on self-reported descriptions of individuals' networks or to painstakingly develop very detailed pictures of such networks (through anthropological participant observation, for example) that cannot feasibly be compiled for more than a small number of people (see Gibson, 2001). This paper, by contrast, demonstrates the tremendous potential of social media data to

more thoroughly characterize the elite and non-elite communication networks of large numbers of people in diverse contexts. Given the increasing evidence in the Internet and politics literature that online activity reveals important information about offline attitudes and behavior (see Halberstam & Knight, 2014), this opens up important new avenues of research for political scientists and social scientists more broadly.

Along these lines, this paper is uniquely situated at the intersection between “big” and “little” data. Although my sample is relatively small, I fully classify networks for each user that include up to almost 4000 “friends.” This is dramatically different from traditional studies that characterize a political communication network as the small handful of people with whom a survey respondent reports discussing politics (Gibson, 2001). Similarly, I select a relatively small number of tweets from each member of my sample to be coded manually by humans, but these tweets are first determined to be relevant by a machine-learning algorithm that analyzes hundreds of thousands of tweets. This strategy allows me to use human coders, who can navigate the nuance of accurately coding 140 character messages in Egyptian Arabic according to a coding system that requires extensive knowledge of the Egyptian political context. This would be a prohibitively expensive (or at least highly inefficient) task without the use of a machine-learning algorithm to select the tweets to be coded beforehand.

It may ultimately be possible to develop a more sophisticated machine-learning algorithm that would allow me to accurately code large number of tweets without employing human coders. Thus far, however, although my algorithm was highly successful determining the relevance of tweets, it could not accurately classify tweets into the six coding categories. Despite employing an iterative process of using human coded data as a training set and repeatedly evaluating the accuracy of the machine-learning results with more human-coded data, it is possible that a nuanced six category coding system may not be the best candidate for accurate categorization of tweets via machine-learning. Ascertaining under what circumstances and for what purpose machine learning can be used at the intersection of “big” and “little” data deserves further attention as it has the potential to provide new methodological opportunities for social scientists.

Finally, on a more substantive level, as the so-called Twitter revolutions have failed to usher in the new wave of democracy championed by pundits in the early days of the Arab Spring, and virulent Islamist-Secular polarization poses a serious threat to positive political developments across the region (Muasher, 2014), understanding the structure of political communication between and among elites and engaged citizens has become particularly pertinent. The results of this paper indicate that the structure of online social networks that Egyptian Twitter users develop may have meaningful consequences for political tolerance—an integral part of successful democratic consolidation. These results suggest that perhaps encouraging dialogue and communication through online social networks may be a small step toward developing a healthier culture of political communi-

cation in a country that has become dangerously polarized as it slides back into the shackles of authoritarianism.

## 8 Appendix

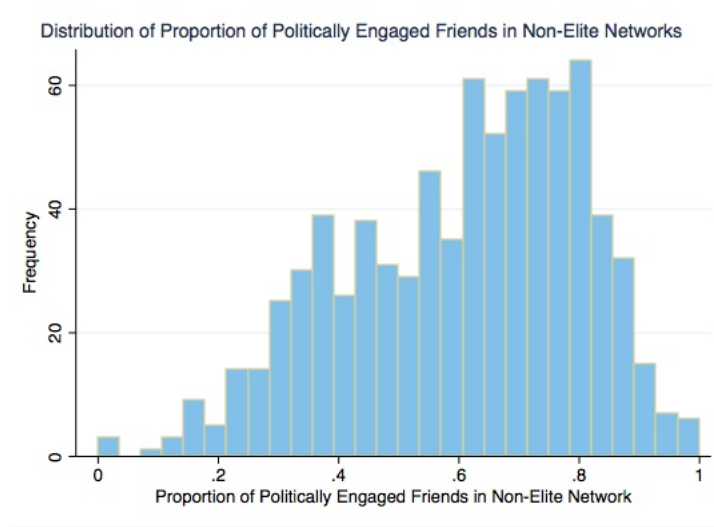


Figure 8: The proportion of politically engaged friends in each sample member’s network is calculated by dividing politically engaged non-elites by total non-elites in a sample members network. “Frequency” refers to the frequency with which this proportion occurs in the sample.

حرية	اعتقال	ناشط	عقوبة	ممنوع
منع	اعدام	حقوق	قانون	التظاهر
أعلام	الشرعية	انقلاب	حكم	اضطهاد
القضاء	حر	نشاطاء	تعدد	ظلام
القاضي	ديمقراطية	كرامة	امن	تروير
العزولي	عدالة	فاشية	عسكر	مراقب
انتهاك	التعبير	طائفية	جريمة	سياسة
عنصرية	سجن	تمييز	الأعتصام	محكمة
قانون	حبس	دستور	انتخابات	صحف
الاستبداد	منشئ	حظر		

Figure 9: Arabic Civil Liberties Keywords

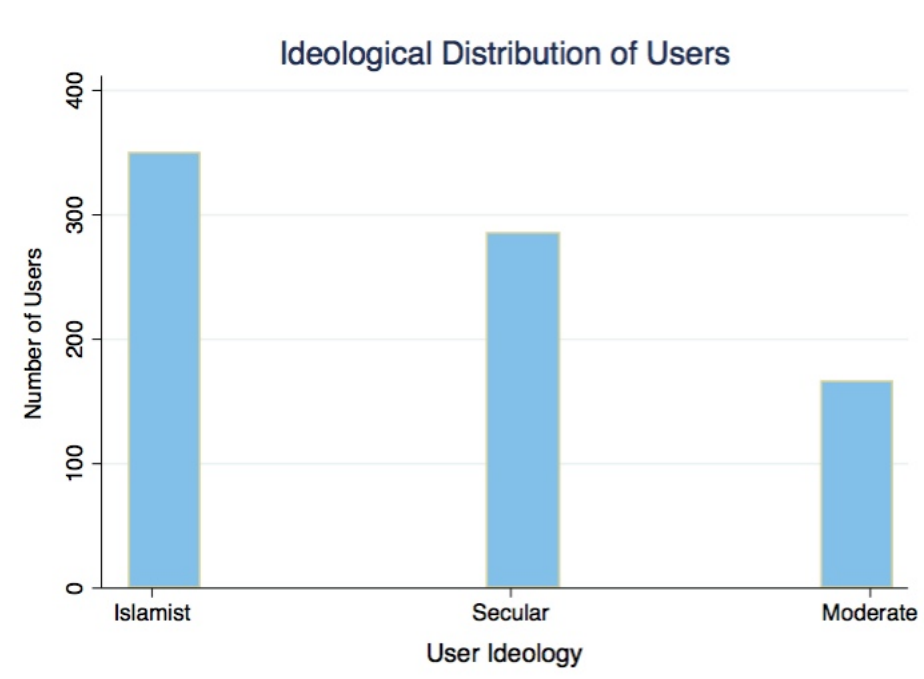


Figure 10



## Examples of Tweets that Fit Categories of Tolerance Coding System

### 1: Tweets that promote civil liberties and rights for Islamists

مش حرب ارهاب دى حرب اخوان

This is not a war on terrorism, it is a war on the Muslim Brotherhood

اعدام الاخوان ام قتل خارج اطار القانون

"The death penalty or killing of the Muslim Brotherhood is outside the framework of the law"

### 2: Tweets that promote civil liberties and rights for Secularists (non-Islamists)

خرجوا علاء ينفخ لونه #خرجوا سناء ينفخ لونها #الحرية للمعتقلين

#Free Alaa to bury his father #Free Sana to bury her father #Freedom for the arrested (Alaa and Sana are secular activists (brother and sister) who are jailed and whose father (a famous human rights activist recently died while they were in jail )

نشيط ومدافع عن حقوق الإنسان من بينهم يارا سلام و سناء سيف أين العدالة اعتقال

Arrest of activists and human rights defenders including Yara Sallam and Sana Seif where is justice (Yara Sallam and Sana Seif are secular activists)

### 3: Tweets that promote civil liberties and rights in general (for all Egyptians)

(: الحمد لله القضاء الإداري يصرح لنا بالظعن على المادتين ٨ ، ١٠ من قانون التظاهر أمام المحكمة الدستورية العليا" مبروووك"

The protest law is being brought before the supreme constitutional court. Thank god the court decided to strike it down.

Congratulationssss ☺

ليست حرة ولا ديمقراطية ، دولة بها سجين رأي واحد ، مصر بها مئات جل آلاف من سجناء الرأي والضمير

Neither free nor democratic, a country with prisoners of opinion and conscience , Egypt has hundreds, even thousands of prisoners of conscience

### 4: Tweets that support restricting the civil liberties and rights of Islamists

pic.twitter.com/z0fnoX3T3y الى سيادة الرئيس .. اعدام هؤلاء الارهابيون هو اتفاقا لمصر .. مصر في خطر "" #اعدم\_التي\_في\_السجون\_يا\_ميس

Mr. President , execute all the terrorists and save Egypt. Egypt is in danger #Death Penalty for all those in Prison

بعد حظر جماعة الاخوان وحظر الاحزاب الدينية في الدستور الجديد تضع مصر اقدامها على طريق الحداثة والتقدم

After the ban on the Brotherhood and the prohibition of religious parties in Egypt's new constitution, we put our feet on the road to modernity and progress.

### 5: Tweets that support restricting the civil liberties and rights of Secularists (non-Islamists)

نقول ثاني يسقط يسقط حكم العسكر ... مصر بلد مش معسكر بلد اسلامي ... لا يهودي ولا علماني رئيسه مرسى ... مش حد ثاني

We say again, Down Down with the Military Reigme. Egypt is an Islamist country...not Jewish...not Secular Morsi is my President...

No one else

لا أمل في ثورة مصر إلا بها الاخوان ارفض التحالف مع الغير اسلاميين بينا وبينهم دم شهداء

There is no help for the Revolution except the #Brotherhood I reject an alliance with any non-Islamists. Between us and them is the blood of martyrs

### 6: Tweets that support restricting civil liberties and rights in general (for all Egyptians)

(: اتمناه حبس جميع نشطاء مصر والاخوان

I hope for the arrest of all of Egypt's activists and the #Brotherhood ☺

يسقط كل من يخالف القانون .. حتى لو كان قانون التظاهر

Down with all of those who violate the law, even the protest law.

Figure 11

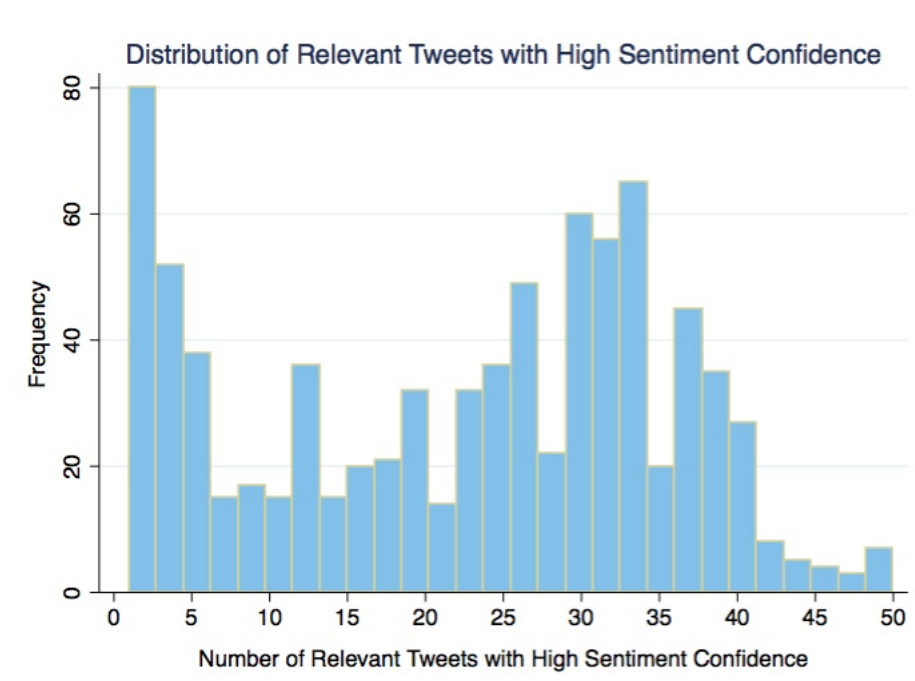


Figure 12: Frequency refers to the frequency with which each number of relevant tweets with high sentiment confidence occurs in the sample

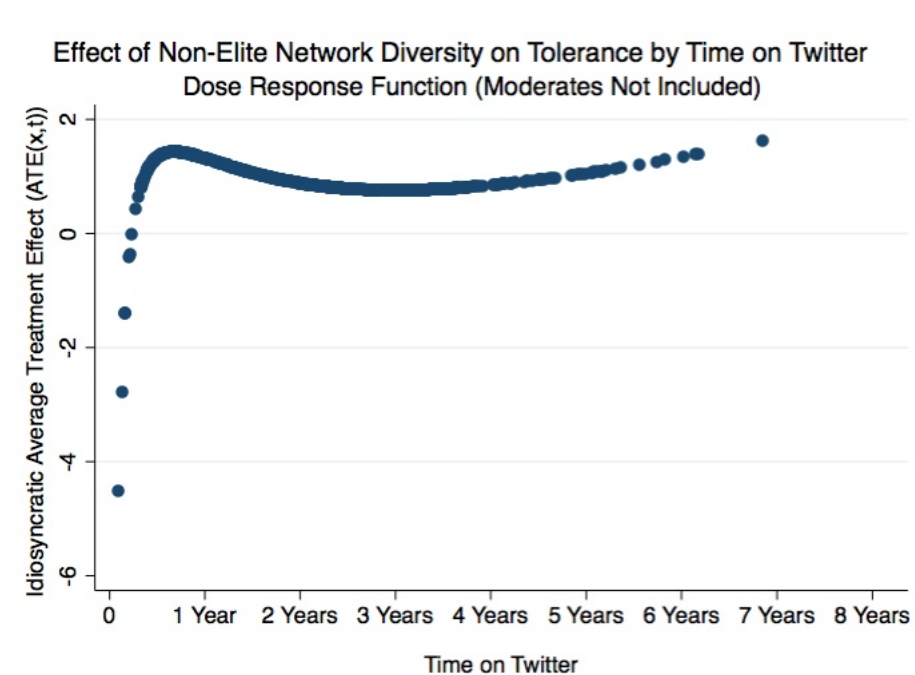


Figure 13: The Y-axis represents the Idiosyncratic Average Treatment Effect or the effect of network diversity on tolerance after having been on Twitter for a given amount of time.

Table 5: Top Egyptian Politicians and Political Movements by Twitter Followers

Handle	Name	Followers	Ideology	Biography
@amrkhaled	Amr Khaled	2667999	Islamist	Former head of the Egypt Party, Preacher
@ElBaradei	Mohamed El Baredai	2435248	Secular	Former VP, Constitution Party Head
@MuhammadMorsi	Muhammad Morsi	2026386	Islamist	Former President of Egypt
@HamdeenSabahy	Hamdeen Sabahy	1954326	Secular	Head of Popular Current Party
@HamzawyAmr	Amr Hamzawy	1838439	Secular	Head of Masr Al-Huriya Party
@DrAbolfotoh	Abdel Moneim Aboul Fotouh	1545437	Islamist	Former Pres. Candidate, Strong Egypt Party
@NaguibSawiris	Naguib Sawiris	1445649	Secular	Head of Free Egyptians Party
@AymanNour	Ayman Nour	1217582	Secular	Head of Al-Gahad Party, Former Pres. Candidate
@GameelaIsmail	Gameela Ismail	1126805	Secular	Constitution Party Former Presidential Candidate
@amremoussa	Amre Moussa	1112843	Secular	Former Head of Conference Party
@naderbakkar	Nader Bakkar	863505	Islamist	Al Nour Party Spokesperson
@shabab6april	April 6th Youth	806764	Secular	April 6th Youth Movement Official Twitter
@Essam_Elerian	Essam Elarian	689893	Islamist	Vice Chairman of the Freedom and Justice Party
@FJparty	Freedom and Justice Party	633982	Islamist	Freedom and Justice Party Official Twitter
@Saad_Elkatatny	Saad Elkatatny	623642	Islamist	Freedom and Justice Party Chairman
@bothainakamel1	Bothaina Kamel	568562	Secular	Independent Presidential Candidate
@HazemSalahTW	Hazem Abu Ismail	553096	Islamist	Former Salafi Presidential Candidate
@AhmedShafikEG	Ahmed Shafik	474945	Secular	Former PM and Head of the Egyptian Patriotic Mov.
@AsmaaMahfouz	Asmaa Mahfouz	421758	Secular	Founder of April 6th Movement
@lassecgen	Nabil Elaraby	393189	Secular	Former member of Mubarak Gov't
@almorshid	Mohammed Badie	390546	Islamist	Supreme Guide of the Muslim Brotherhood
@GameelaElex2014	Gameela Ismail's Election Campaign	380975	Secular	Gameela Ismail's Election Campaign Official Account
@DrEssamSharaf	Essam Sharaf	357727	Secular	Former Prime Minister, Former NDP
@khairatAlshater	Khairat Al-Shater	341298	Islamist	First Deputy Chairman of the Muslim Brotherhood
@DrHaniSarieldin	Hani Sarieldin	334355	Secular	Founder of Free Egyptians Party
@MohamedElgawady	Mohamed El-Gawady	307958	Islamist	Brotherhood Activist
@M6april	April 6th News	305240	Secular	April 6th Movement Official News Portal
@ElBaradeiOffice	Mohamed El-Baradei's Office	288314	Secular	El-Baradei's Office Official Account
@Alwasatpartyeg	Al-Wasat Party	279991	Islamist	Al- Wasat Party
@wael	Wael Khalil	269138	Secular	Former prominent member of the Revolutionary Socialists
@a_sayyad	Ayman Sayyad	262415	Islamist	Former member of Morsi's advisory board
@HatemAzzam	Hatem Azzam	255592	Secular	Former MP, Civilization Party
@DoctorMahsoob	Mohamed Mahsoob	222381	Islamist	Former Islamist MP
@3arabawy	Hossam El-Hamalawy	208453	Secular	Prominent Member of the Revolutionary Socialists
@GhostyMaher	Ahmed Maher	195243	Secular	Founder of the April 6th Movement
@AlsisiOfficial	Abdel Fatah El-Sisi	194612	Secular	El-Sisi's Official Twitter
@AlDostourP	Constitution Party	194217	Secular	Constitution Party Official Twitter
@MisrAlQawia	Strong Egypt Party	186447	Islamist	Strong Egypt Party Official Twitter
@ma7mod.badr	Mahmoud Badr	177167	Secular	Founder of Tamarod Movement
@RevSocMe	Revolutionary Socialists Party	159835	Secular	Revolutionary Socialists Party Official Twitter
@DrHigazy	Mostafa Higazy	145727	Secular	Sisi Advisor, NASAQ Foundation for Strategic and Humanistic Thinking
@TayarSha3by	Popular Current	132848	Secular	Popular Current Party Official Site
@Ikhwanweb	Ikhwan Web	126472	Islamist	Official Account of the Muslim Brotherhood
@ikhwantawasol	Ikhwan Online	112472	Islamist	Official Muslim Brotherhood News Portal
@DrMohamadYousri	Mohamad YousriIbrahim	109186	Islamist	Salafi Politician
@DrMorsiNews	Morsi News	100879	Islamist	Morsi News Official Twitter
@almogheer	Ahmed Al-Mogheer	98146	Islamist	Prominent Brotherhood Member
@Dr_pakinam	Pakinam El-Sharkawy	96348	Islamist	Morsi Aid
@bkhafagy	Bassem Khafagy	92880	Islamist	Former Islamist Presidential Candidate
@tamarrod	Tamarod Movement	91801	Secular	Tamarod Official Twitter
@alwafdwebsite	Al-Wafd Party	91234	Secular	Al-Wafd Party
@mrmeit	Mohammed Adel	85473	Secular	Founder of April 6th Movement
@abkamal	Abdullah Kamal	83529	Secular	Former MP National Democratic Party
@hossam_moanis	Hossam Moanis	83263	Secular	Popular Current Party Spokesperson
@gelhaddad	Gehad el-Haddad	72067	Islamist	Media Spokesperson for the Muslim Brotherhood
@Elsisi_General	President Sisi	65614	Secular	President of Egypt
@basemkamel	Basem Kamel	56292	Secular	MP and member of the Social Democratic Party
@amr_darrag	Amr Darrag	51291	Islamist	Former Secretary General of the Egyptian Constituent Assembly
@MasreyeenAhrarr	Free Egyptians Party	48460	Secular	Free Egyptians Party Official Twitter
@salafynews	Salafi News	41217	Islamist	Pro-Salafi News Twitter
@tamroud	Tamarod Account	40130	Secular	Tamarod Account
@RabaaHeros	Rabaa Heros	36782	Islamist	Rabaa al-Adawiya Twitter Account
@FJPartyAlex1	Alexandria FJP	35945	Islamist	Alexandria Official FJP Twitter
@MasrAlhureyya	Masr Al-Huriya Party	34243	Secular	Egypt Freedom Party Official Twitter
@drtarekelzomor	Tarek El-Zomor	33548	Islamist	Head of Building and Deveopment Party
@A_khaleel_kh	Ahmed Khalil Khairallah	32622	Islamist	Former Salafi MP
@anasalafy1	I am Salafi	30663	Islamist	Pro-Salafi Twitter
@AZELHARIRY	Abu Azel Hariry	30625	Secular	Former MP and member of the Popular Socialist Alliance Party
@EladlParty	Justice Party	30519	Secular	Justice Party Official Twitter
@dryasserborhamy	Yasser Borhamy	27409	Islamist	VP of the Salafi Call, founder of Al-Nour Party
@6AprilYouth	April 6th Youth	20116	Secular	April 6th Movement Official Twitter
@NabdRab3a	Rabaa al-Adawiya	19842	Islamist	Rabaa al-Adawiya Twitter Account
@DrSayedElbadawy	Sayed El-Badawy	19251	Secular	Head of al-Wafd Party
@FjpartyOrg	FJP English Official	18100	Islamist	The official English Twitter of the Freedom and Justice Party (FJP)
@HalaShuk	Hala Shukralla	16446	Secular	Head of Egyptian Constitution Party
@ch4hazim	Hazem Abu Ismail Support Page	14816	Islamist	Hazem Abu Ismail Suport Twitter
@elnourpartynews	Al-Nour Party News	13675	Islamist	Al-Nour Party Official News Portal
@alwafdportal	al-Wafd Party News	13365	Secular	Al-Wafd Party News Portal
@yonosmakhyoun	Yunos Makhyoun	13093	Islamist	Prominent Salafi
@DrAbdelhafeez	Mohamed Abdelhafeez	12389	Islamist	Prominent Freedom and Justice Party Member

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