# Discovering Discourse: The Relationship between Media and NGOs in Egypt between 2011–13

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On February 20, 2011, Jeffrey Ghannam wrote an essay for the Outlook section of The Washington Post under the headline "Freedom, beyond 140 Characters" in which he claimed that social media proved to be a "far bigger threat" to Egyptian president Hosni Mubarak than other forms of protest. While he recognized that social media cannot change things by themselves, they are "chronicling and amplifying the revolution that is happening on the streets."

The potential impact of media on the changes in Egypt and the Arab Spring writ large have grabbed the attention of social science researchers with good reason. The relationship between the media and revolution, social movement and political protests has been an attractive topic for generations of scholars: from "Fire in the Minds of Men"[1] in which Billington explored the relationship between media and revolutions,

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[1] James Billington, *Fire in the Minds of Men: Origins of the Revolutionary Faith* (New York: Basic Books, 1980).

to Deutsch's famous study on "Nationalism and Social Communication"[2] and the uses of the media for smaller scale political protest during the Cold War in Eastern Europe.[3]

Some research is more descriptive and country specific, such as The Arab Press[4] or Press Freedom and Communication in Africa,[5] while other researchers explore the nuances of different types of media in different situations. At times, these situations are social movements that seem revolutionary. At other times, they take place on a smaller scale, through organized and/or spontaneous political protest or lobbying the existing political establishment.

In the past few years, the Middle East has risen to the forefront of this discussion through the Arab Spring: a series of political changes, some successful and others not. The role of media in the Arab Spring— especially social and independent media— has been at the core of broader global debates. The cheerleaders praise the value of independent media in political change.[6] There are also those who caution that media's impact may be less than originally thought or, in some cases, even nonexistent.[7]

The expectation for the media's role will be different in democratic and autocratic societies, but in both the relationship between social movements and the media is always unequal. Social movements suffer from "asymmetrical dependency"[8]— movements need media but media do not necessarily need to cover social movements to fulfill their mission of disseminating information. To gain media support for their causes, movements change their message and reframe their causes to be more palatable for media audiences. Further, under autocratic regimes specifically, opposition organizations and independent media must navigate enhanced government scrutiny in order to spread their messages.

This asymmetry between media and social movements provides fertile ground for a variety of research questions. Initially, we will explore this relationship using independent media and civil society organizations in Egypt as representations of the broader categories. What topics do independent media cover in relation to the NGOs? How and under what conditions does media coverage of NGO activities and the use

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[2] Karl Deutsch, *Nationalism and Social Communication* (Cambridge, Massachusetts: The MIT Press, 1958).

[3] Jane Leftwich Curry and A. Ross Johnson, *The Media and Intra-Elite Communication in Poland: Cast Studies of Controversy*, N-1514/5 (Santa Monica, California: Rand Corporation, 1980).

[4] William A. Rugh, *The Arab Press* (Syracuse, New York: Syracuse University Press, 1987).

[5] Festus Eribo and William Jong-Ebot, *Press Freedom and Communication in Africa* (Trenton, New Jersey: Africa World Press, 1997).

[6] Xose Soengas, "The Rold of the Internet and Social Networks in the Arab Uprisings - an Alternative to Official Press Censorship," *Comunicar* 21, no. 4 (2013): 147–155.

[7] Alexa Robertson, "Connecting 'Old' and 'New' Media and the Arab Spring," *The International Journal of Press/Politics* 18, no. 3 (2013): 325–341.

[8] William A. Gamson and Gadi Wolfsfeld, "Movements and Media as Interacting Systems," *Annals of the American Academy of Political and Social Science* 528 (July 1993): 125.

of NGOs as sources differ over time and news story? To answer these questions, we will analyze articles from Egypt Independent and Daily News Egypt, non-state independent English-language news outlets, and al-Ahram English, the official English-language state-run media outlet.

## Media and Social Movements

The relationship between mass media, social movements and protest is complex. Most theories of social movement success and failure imply, at minimum, the need for a communications mechanism. Traditionally, scholars refer to three models to explain the structure and function of social movements: the Classical Model, the Resource Mobilization Model and the Political Process Model.

The Classical Model outlines how movements are a collective experience of mass society in reaction to injustice and emphasizes the psychological underpinnings of participants. Movements are *not* about political action, but instead are about personal motivations, such as feelings of anxiety or frustration with some contemporary situation or event.[9] Protesters and participants would utilize media to incite the necessary emotions in their audiences to invite broader mobilization and action.

The Resource Mobilization Model argues that resources are a crucial part of the social mobilization process. The term 'resources' is broadly interpreted to mean money, mobilization tools, and persons involved in the process, such as leaders, staff, volunteers, or members.[10] Media are usually part of the "tools." This model emphasizes the need for resources—tools like mass media—over the need for a general societal investment or support. Therefore, collective action for this type of mobilization is focused on how a few individuals with the proper resources decide to pursue the social goal. Critics say that the Resource Mobilization Model dehumanizes the process and removes it from the context of the time and the passion of those involved.

The Political Process Model emphasizes the need for political opportunity in order to have a successful movement. Combining the foci of the other models, organizational strength (which may be seen as a resource) and a common set of personal beliefs or motivations are integral for the development of movements.[11] Unlike the other two theories, the Political Process Model highlights the importance of the context of the movements. Complete analysis of a social movement comes only through understanding its contemporary administrative and institutional structures and its subsequent success or failure is the result of how well the movement uses a politi-

[9]Douglas McAdam, *Political Process and the Development of Black Insurgency, 1930-1970* (Chicago: University of Chicago Press, 1985).

[10]Wim van de Donk et al., *Cyberprotest* (London: Routledge, 2004).

[11]McAdam, *Political Process and the Development of Black Insurgency, 1930-1970*.

cal opening or structural weakness. The media are used to taking advantage of these political opportunities.

Delving more deeply into the relationship between media and social movements, researchers tend to agree that media, generally defined as any means used for mass communication, are integral to the success of a movement.[12] Although movements (including violent ones, such as some types of revolutions and terrorist actions) need the media to achieve their goals, media are not dependent on movements for their success. In fact, tensions arise between media and social movements due to conflicting goals.[13] The media's ability to frame issues and transform messages affects the relationship between the two as well, since media framing can facilitate success (or failure) of a movement.[14] In a very helpful review essay, Benford and Snow note that "social movement activists rarely exercise much control over the 'stories' media organizations choose to cover or how the media represent the activists' claims."[15]

The research discussing media and social movements emphasizes the need for media coverage during movements. Although movements may have specific purposes in mind when utilizing media, general coverage is necessary in order to convey their message to a broader audience and continue growing.[16] In fact, without the media, social movements can remain unnoticed by those not involved with the process.[17]

Adapting from Gamson and Wolfsfeld, when pushing for success, participants in social movements reach out to mass media outlets with particular goals:

1. informing the general public; it can be difficult for those not involved in the movement to know about it without mass media attention;
2. allowing for discourse to discuss the topics at hand, deliberate, and find validation or solidarity;[18] which could lead to consensus and solidarity among those in the movement or, alternatively, allow voices to critique the organization and its structure; and

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[12] Charlotte Ryan, *Prime Time Activism: Media Strategies for Grassroots Organizing* (Cambridge, MA: South End Press, 1991); Sidney Tarrow, *Power in Movement: Social Movements and Contentious Politics* (Cambridge: Cambridge University Press, 2011).

[13] Ryan, *Prime Time Activism*.

[14] Harvey Molotch, "Media and Movements," in *The Dynamics of Social Movements: Resource Mobilization, Social Control, and Tactics*, ed. Mayer N. Zald and John David McCarthy (Cambridge: Winthrop Publishers, 1979).

[15] Robert D. Benford and David A. Snow, "Framing Processes and Social Movements: An Overview and Assessment," *Annual Review of Sociology* 26 (2000): 626.

[16] Alice Holmes Cooper, "Media Framing and Social Movement Mobilization: German Peace Protest Against INF Missles, the Gulf War and NATO Peace Enforcement in Bosnia," *European Journal of Political Research* 41, no. 1 (January 2002): 37–80.

[17] Donk et al., *Cyberprotest*.

[18] Harvey Molotch, "Capital and Neighborhood in the United States: Some Conceptual Links," *Urban Studies Review* 14, no. 3 (1979): 289–312.

3. organizing others to participate, potentially including larger portion of the public; Carroll & Ratner[19] propose that media usage for outreach by NGOs can be both mainstream media, but also internally organized media outlets as well, such as a web presence.

Yet, media are a separate entity with their own sets of goals and priorities, sometimes referred to as media roles. These roles, sometimes self-defined or alternatively applied by others, might include: disseminating news, being profitable, acting as a watchdog, mediating between parties, or being a voice for those in power.

As a result, conflicts may arise between media and social movements when there is a gap in understanding or expectations between the two. Movements are meant to challenge the hegemonic discourse of events, in order to shift it toward one that is more productive for them. Nevertheless, media are very much a part of the dominant culture, so there is an inherent tension when movements attempt to change how media act and what media convey to their audiences. Although movements may need media to thrive, the media do not need movements to continue to function. As stated above, the relationship is asymmetrical. Thus, social movements frequently must conform, mitigate, or change their messages to receive adequate media coverage.

One reason for the asymmetry is the media's reliance on news values,[20] or criteria by which news organizations decide what is worth covering. The most prominent news value is "conflict" and many societal groups understand this. For example, groups that engage in violent activity may do so to attract media attention. While media are not dependent on this type coverage to survive, groups who engage in violent activities, such as terrorists, learn to exploit the media's desire for sensationalism and the coverage of vicious, disruptive actions. Given this relationship, even though it is not explicitly agreed to, violent organizations are able to showcase their actions to global audiences, disseminate their messages to interested parties, and gain recognition and legitimacy.[21]

One important aspect that affects the power dynamic between media and movements is media's ability to frame issues. In this context, framing is defined as the process of interpreting, transforming, or creating significance for events being described. Although frames are often used for productive means, such as building further dialogue, frames can be used for detrimental purposes as well. "Rather than constituting

[19]William K. Carroll and R. S. Ratner, "Media Strategies and Political Projects: A Comparative Study of Social Movements," *The Canadian Journal of Sociology* 24, no. 1 (1999): 1–34.

[20]Leonard Downie and Robert Kaiser, *The News About the News* (New York: Vintage Press, 2003), chap. 8.

[21]Brigitte L. Nacos, *Mass-Mediated Terrorism: The Central Role of the Media in Terrorism and Counterterrorism* (Lanham, Maryland: Rowman & Littlefield, 2007), 91–108.

a neutral arena, media framing often lends more support to certain actors and discourses than to others."[22]   Since movements need beneficial frames in order to advance forward, the frames chosen by the journalists, editors and sources will affect the relationship between the two.  Gamson and Wolfsfeld propose that movements actually need to negotiate with media to ensure that coverage includes advantageous frames, another example of the asymmetry in the relationship.

The implication is that movements—and the NGOs that represent them—may also be conscious framers.  When present information to the media, NGOs have an interpretation of events or situation that they would like to set represented in the public discourse.  Often their ability to get their frame into the media shows their strength and savvy.

Online technologies have had an impact on media activity, though, for this project, media include both print and online.  The internet is a form of media that produces, consolidates and shares information with the "masses."  Some researchers argue that its growth as a news source serves as a challenge to traditional media, since many of the previous constraints and controls by corporations or the government are more difficult to apply online.[23]   Gance et al.[24] argue that the internet provides a space for those to speak up who have typically been silenced by the military or government-controlled media.  Schuler and Day[25] discuss how the internet can expand the public sphere to allow for democratization on a larger and larger scale.  The manifestations of these research studies are both independent media outlets and non-governmental organizations that want to spread a specific message.

As a first stage of analysis to better understand this relationship, we will examine a cross-section of NGOs as one possible example of groups within a social movement and independent media as one possible example of media in general, to evaluate under what conditions the relationship between them proves to be advantageous or not to either party.  The initial evaluation will examine three Egyptian news sources to discover which news categories are more likely to be covered when an NGO is either mentioned in the article or used as a source.

## Data and Methods

The English-language Egyptian press provides the relevant cases for this evaluation. Despite the authoritarian nature of former president Hosni Mubarak's regime, Egypt

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[22] Cooper, "Media Framing and Social Movement Mobilization," 38.

[23] Annabelle Sreberny and Gholam Khiabany, *Blogistan* (London: I.B. Tauris & Co. Ltd., 2010).

[24] Stephen Gance, An De Vaney, and Yan Ma, *Technology and Resistance* (New York: Peter Lang Publishing, 2000).

[25] Douglas Schuler and Peter Day, eds., *Shaping the Network Society* (Cambridge, Massachusetts: The MIT Press, 2004).

has long had an active journalism sector, with dozens of widely circulated Arabic-language newspapers—Al-Ahram, the official news outlet for the state, has published continuously since 1875. In the late 2000s journalists and private sector investors opened English-language publications either as entirely new ventures or as spin-offs of already existing Arabic newspapers. We focus on three of the most prominent publications: al-Ahram English, Daily News Egypt, and Egypt Independent.

In the late 1990s, Al-Ahram Arabic began publishing a separate English newspaper, and following a move to online distribution in the mid 2000s, al-Ahram English has become the most read English-language publication in the Middle East.[26] A group of independent journalists formed Daily News Egypt in 2005 and quickly built up a wide audience, securing distribution rights with the International Herald Tribune. In May–June 2012, the ownership of the paper changed hands, but it has continued to publish daily both in print and online and continues to claim to be "the only independent English-language printed daily in the country."[27] In the late 2000s, the independently owned Arabic daily al-Masry al-Youm began including a weekly English supplement, which evolved into Egypt Independent, published in print and online beginning in November 2011 under the direction of an independent editorial board. However, al-Masry al-Youm's owners unexpectedly shuttered the publication in April 2013 following alleged government pressure. Egypt Independent has since restarted its publication, but as an online-only English supplement to al-Masry al-Youm Arabic.

Egypt also has a long history of associational life and civil society organizations. Islamic religious endowments (*awqaf*) have provided substantial non-governmental social services since medieval times, and Western-style charitable, civic, and advocacy associations emerged in the 1800s.[28] While many of these organizations were closed or marginalized following the rise of Gamal Abdel Nasser in 1954, in the 1980s Hosni Mubarak greatly expanded the purview of civil society and permitted thousands of NGOs and other organizations to apply for official incorporation. However, the government reserved the right to shutter and ban any organization that engaged in political activity (or any activity against the state), in addition to a host of other stifling regulations.[29] The emerging civil society sector took advantage of this newfound openness, but at the cost of subjecting itself to state authority. Law 84 of 2002, or the

[26]"Al-Ahram tops online newspapers in Arab world: Forbes," *al-Ahram English*, December 27, 2012, http://english.ahram.org.eg/NewsContent/1/64/61353/Egypt/Politics-/AlAhram-tops-online-newspapers-in-Arab-world-Forbe.aspx.

[27]"Daily News Egypt: Final Words," *Daily News Egypt*, April 22, 2012, http://thedailynewsegypt.com/2012/04/22/daily-news-egypt-final-words/

[28]Amani Kandil, Stefan Toepler, and Lester M. Salamon, "Egypt," in *Global Civil Society: Dimensions of the Nonprofit Sector*, ed. Lester M. Salamon and S. Wojciech Sokolowski, vol. 2 (Bloomfield, CT: Kumarian Press, 2004), 217–26.

[29]Amaney Jamal, *Barriers to Democracy: The Other Side of Social Capital in Palestine and the Arab World* (Princeton: Princeton University Press, 2007), 124.

Law on Non-Governmental Societies and Organizations, granted formal civil society organizations the legal permission to operate, but within fairly restrictive boundaries. Law 84/2002 established a set of "red lines" that organizations were forbidden to cross—organizations focused on social reform, political liberalization, or civil rights advocacy were not legally allowed to pursue any agenda contrary to the regime. Despite these restrictions, however, dozens of advocacy and civic organizations have been active in Egypt (often backed by foreign interests) and have carefully navigated or circumvented governmental regulations to do so.[30] There are now an estimated 20,000–30,000 registered NGOs in the country, including labor unions, charities, advocacy organizations, human rights groups, policy and legal think tanks, and religious organizations, thus comprising perhaps the largest NGO sector in the region.

To understand how the English-language Egyptian media cover the activities of advocacy NGOs, we compiled a list of organizations with missions focused on civil liberties and human rights (see Table 1). On May 30, 2013, 40 Egyptian NGOs signed an open letter originally penned by the Egyptian Initiative for Personal Rights (EIPR), expressing deep concern over new draft legislation to severely limit the power of the civil society sector, prohibiting foreign donations and funding, requiring more onerous state registration, imposing heavy fines for minor infractions, and other restrictions.[31] While this list of signatory organizations is not fully representative of the full Egyptian civil society sector, or even all Egyptian human rights organizations,[32] the fact that these organizations signed an English-language open letter, published online and publicized by English-speaking Twitter users, bloggers, and reporters, with the clear goal of reaching an English speaking audience, is indicative of a self-selecting preference toward English-language media. This list, though imperfect and non-comprehensive, is a good sample of Egyptian NGOs that regularly engage with the English-speaking Egyptian media.

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|---|---|---|
| Andalus Institute for Tolerance and Anti-Violence Studies | Appropriate Communications Techniques for Development | Arab Foundation for Civil Society and Human Right Support |
| Arab Network for Human Rights Information | Arab Penal Reform Organization | Arab Program for Human Rights Activists |
| Association for Freedom of Expression and of Thought | Awlad Al Ard Association | Baheya Ya Masr |
| Better Life Association | Center for Egyptian Women's Legal Assistance | Egyptian Association for Economic and Social Rights |

[30] Sarah Yerkes, "Capture, Co-Optation, and Pluralism: Navigating the Civil Society Arena in the Arab World" (PhD thesis, Georgetown University, 2012).

[31] Egyptian Initiative for Personal Rights, "The Muslim Brotherhood Lays the Foundations for a New Police State by Exceeding the Mubarak Regime's Mechanisms to Suppress Civil Society," May 30, 2013, http://www.eipr.org/en/pressrelease/2013/05/30/1720.

[32] Finding a comprehensive list of human rights-oriented NGOs is unfortunately impossible as the Ministry of Social Affairs does not provide a public list of registered organizations.

| | | |
|---|---|---|
| Egyptian Center for Support of Human Rights | Forum for Women in Development | Habi Center for Environmental Rights |
| Hemaia Center for Supporting Human Rights Defenders | Initiators for Culture and Media | Misryon Against Religious Discrimination |
| Mother Association for Rights and Development | Nazra for Feminist Studies | Rural Development Association |
| Shahid Center for Human Rights | Social Democracy Studies Center | Tanweer Center for Development and Human Rights |
| The Arab Foundation for Democracy Studies and Human Rights | The Cairo Institute for Human Rights Studies | The Egyptian Association for Community Participation Enhancement |
| The Egyptian Center for Economic and Social Rights | The Egyptian Center for Public Policy Studies | The Egyptian Coalition for the Rights of the Child |
| The Egyptian Foundation for the Advancement of Childhood Conditions | The Egyptian Initiative for Personal Rights | The Egyptian Organization for Human Rights |
| The Hesham Mobarak Law Center | The Human Right Association for the Assistance of the Prisoners | The Human Rights Legal Assistance Group |
| The International Center for Supporting Rights and Freedoms | The Land Center for Human Rights | The New Woman Foundation |
| Women and Memory Forum | | |

Table 1: List of NGOs

## Summary statistics

Our full corpus, summarized in Table 2, consists of more than 55,000 articles published by the independently published Daily News Egypt and Egypt Independent and the state-owned al-Ahram English between November 24, 2011 and April 25, 2013, the first and final days of Egypt Independent's regular weekly coverage under an independent editorial board. We limit the coverage of all three publications to Egypt Independent's lifetime to (1) analyze the maximum number of English-language articles published simultaneously by the three outlets (i.e. to avoid looking at events that Egypt Independent could not have covered), and (2) determine if Egypt Independent's NGO coverage fell outside the norms of general independent media coverage, perhaps explaining, in part, why the publication was shut down in April 2013. In order to see how these publications cover NGO activities, we select a small subset of 515 articles that mention the names of the 40 self-identified advocacy NGOs.

Our subset of 40 NGOs had far more coverage in independent publications than in state-owned media. Daily News Egypt and Egypt Independent mentioned these NGOs in around 2% of their articles on average, while al-Ahram English rarely covered any of these NGOs' activities, with only 0.3% of their much more voluminous output mentioning these organizations. This trend holds over time as well (see Figure 1). Both Daily News Egypt and Egypt Independent consistently cover these or-

ganizations in 2–4% of their articles each month (with the exception of Daily News Egypt in mid-2012, which stopped publication for several weeks as it changed ownership), while al-Ahram never surpasses 0.5% in any month. Preliminarily, it appears that NGOs that cater to English-speaking audiences are far more likely to have their messages covered in independent media than state-run media.

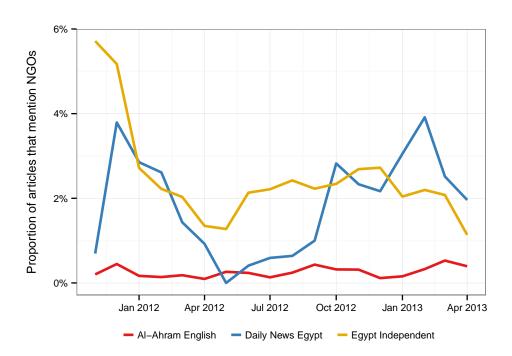| Publication | Articles | Articles (NGOs) | NGO articles (%) |
|---|---|---|---|
| Al-Ahram English | 36,795 | 97 | 0.26% |
| Daily News Egypt | 10,328 | 221 | 2.14% |
| Egypt Independent | 8,822 | 197 | 2.23% |
| **Total** | **55,945** | **515** | **0.92%** |

Table 2: Summary of corpus and subset



Figure 1: Proportion of articles that mention NGOs in subset, November 2011–April 2013

## Topic modeling

Close textual analysis of every article in our corpus is infeasible and impractical. However, recent developments in text mining and computational linguistics have created new methods for distant reading, or using visual and quantitative tools to generate abstract "graphs, maps, and trees"[33] to analyze—or "read"—large corpora of text.[34] Topic modeling has become a popular application of distant reading, allowing scholars to "step back from individual documents and look at larger patterns among [the entirety of an archive]."[35] One recent probabilistic topic modeling algorithm—latent Dirichlet allocation (LDA)—uses a multilevel generative Bayesian probabilistic process to model the mixture of unknown latent topics in a corpus of documents.[36]

With this algorithm, each word in each document is assumed to have emerged from a generative probabilistic process based on distributions of words, topics, and documents. Words in the corpus are not assumed to have any grammatical meaning and are instead treated as tokens—rather than attempt to use natural language structure, the corpus is simply a "bag of words." Each underlying topic in the corpus consists of probability distributions for *every* word in the corpus vocabulary and is drawn from a Dirichlet distribution with the parameter $\alpha$ (included in our model's output to roughly represent the proportion each topic appears in the corpus). Individual documents in the corpus are then defined by a separate Dirichlet distribution (with parameter $\beta$) that determines which topics are more likely to occur in each document. Documents in the corpus are assumed to be randomly generated according to these underlying probabilistic distributions—a document will have a given distribution of topics and consist of a random draw of words belonging to those topics. Finally, iterative Bayesian posterior inference can be used to infer the parameters and probabilities of each of these underlying distributions, resulting in a complete probabilistic topic model.

More simply, LDA assumes that every document in the corpus is composed of a random distribution of corpus-wide topics and that each topic contains words that are more probable that others. Figure 2, adapted from Blei,[37] demonstrates the intuition behind the LDA process. In this image, two documents are shown with different latent topic distributions (visible in the miniature histograms), indicating that each

[33] Franco Moretti, *Graphs, Maps, Trees: Abstract Models for Literary Theory* (London: Verso, 2005).

[34] Matthew G. Kirschenbaum, "The Remaking of Reading: Data Mining and the Digital Humanities," October 2007, http://www.csee.umbc.edu/~hillol/NGDM07/abstracts/talks/MKirschenbaum.pdf.

[35] Robert K. Nelson, *Mining the* Dispatch, Interactive topic modeling project (University of Richmond Digital Scholarship Lab, 2011), http://dsl.richmond.edu/dispatch/.

[36] David M. Blei, Andrew Y. Ng, and Michael I. Jordan, "Latent Dirichlet Allocation," *Journal of Machine Learning Research* 3 (2003): 993–1022.

[37] David M. Blei, "Probabilistic Topic Models," *Communications of the ACM* 55, no. 4 (April 2012): 77–84.

**Topics**

| egypt | $(p_w)$ |
| peopl | $(p_w)$ |
| egyptian | $(p_w)$ |
| . . . | |

| protest | $(p_w)$ |
| tahrir_squar | $(p_w)$ |
| . . . | |

| court | $(p_w)$ |
| right | $(p_w)$ |
| case | $(p_w)$ |
| . . . | |

| constitu | $(p_w)$ |
| brotherhood | $(p_w)$ |
| . . . | |

| militar | $(p_w)$ |
| scaf | $(p_w)$ |
| . . . | |

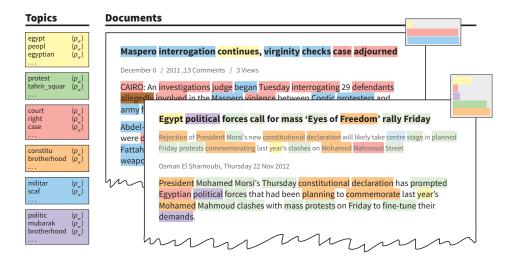| politic | $(p_w)$ |
| mubarak | $(p_w)$ |
| brotherhood | $(p_w)$ |
| . . . | |

Figure 2: Diagram of LDA process

document should be proportionally composed of words belonging to those topics. The right of the figure shows excerpts from the different topic distributions, where each topic contains each word in the corpus, but occurring with varying probabilities. The documents themselves represent random draws of words from these topic distributions according to the within-document distribution of topic probabilities. By changing and refining the parameters of the model over hundreds of iterations, we can approximate the probabilities of the words in each topics, as well as the composition of topics in each document.

LDA has become a popular method of distant reading because of its simplicity and intuitiveness. In contrast with other textual analysis methods that rely on natural language and nuanced meaning, LDA explicitly does not account for syntax, grammar, word order, or context. Because it converts words to tokens, LDA is language agnostic and can be applied to any unstructured text-based corpus. Topic modeling has recently become especially popular among historians, who have used it to analyze the 10,000-entry diary of an 18th century midwife,[38] discover trends in fugitive slave advertisements during the Civil War[39], and investigate cultural trends in 19th cen-

[38]Cameron Blevins, "Topic Modeling Martha Ballard's Diary," *historying: thoughts on Scholarship and History in a Digital Age* (April 1, 2010), http://historying.org/2010/04/01/topic-modeling-martha-ballards-diary/.

[39]Nelson, *Mining the* Dispatch.

tury Pennsylvania[40] while scholars of the humanities have used the method with the works of Proust[41] and Byron and Austen[42]. LDA has even been used on non-textual corpora to categorize archeological objects found in Pompeii.[43] Scholars outside the digital humanities have also used topic modeling to determine underlying political agendas in US Senate press releases[44] and to measure how anti-Muslim fringe organizations dominate US media discourse.[45]

## Results

Building on this growing body of topic modeling literature, we use LDA to determine how the English-language Egyptian press covered a subset of NGO activities throughout the 17-month period of independent publication of Egypt Independent.

### Corpus preparation

As discussed above, LDA iterates through a collection of tokens (or a "bag of words") to determine which tokens probabilistically belong to a given number of topics. To enhance the quality of the words in our corpus, and to prevent incorrect assignment of words to topics in our topic model, we first processed and refined our corpus in three ways.[46] First, we filtered out 526 stop words, or commonly occurring conjunctions and adverbs that can clutter the topic generation process, including "a," "and," "because," "before," and others. We also removed the Arabic definite article "al" and

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[40] David J. Newman and Sharon Block, "Probabilistic Topic Decomposition of an Eighteenth-Century American Newspaper," *Journal of the American Society for Information Science and Technology* 57, no. 6 (April 2006): 753–67.

[41] Clay Templeton, "Topic Modeling in the Humanities: An Overview," *Maryland Institute for Technology in the Humanities Blog* (August 1, 2011), http://mith.umd.edu/topic-modeling-in-the-humanities-an-overview/; Jeffrey Drouin, "Foray into Topic Modeling," *Ecclesiastical Proust Archive* (March 17, 2011), http://orgs.utulsa.edu/proust/?q=node/35.

[42] Travis Brown, *About the Woodchipper: Byron and Austen*, Demonstration of text visualization and analysis tool (Maryland Institute for Technology in the Humanities, 2011), http://mith.umd.edu/corporacamp/tool.php.

[43] David Mimno, "Reconstructing Pompeian Households," *CoRR* abs/1202.3747 (2012), http://arxiv.org/abs/1202.3747.

[44] Justin Grimmer, "A Bayesian Hierarchical Topic Model for Political Texts: Measuring Expressed Agendas in Senate Press Releases," *Political Analysis* 18, no. 1 (Winter 2010): 1–35.

[45] Christopher A. Bail, "The Fringe Effect: Civil Society Organizations and the Evolution of Media Discourse About Islam Since the September 11th Attacks," *American Sociological Review* 77, no. 6 (December 2012): 855–79.

[46] Following the pattern of Jacopo Soriano, Timothy Au, and David Banks, "Text Mining in Computational Advertising," *Statistical Analysis and Data Mining* 6, no. 4 (August 2013): 273–85.

its Egyptian variant "el." We then used natural language text processing[47] to stem each of the remaining words in the corpus, converting words with similar roots (e.g. "continue", "continuing", and "continued") into a base token free of "linguistic subtleties"[48] such as pluralization and tense (e.g. "continu"). Finally, because LDA's "bag of words" approach does not take word order within documents into account, it does not consider commonly occurring phrases like "Muslim Brotherhood" and "civil society" and instead treats them as individual tokens. To address this, we identified significant bigrams—sequences of two words that have a statistically significant probability of co-occurrence. We sorted all bigrams in the entire corpus by their likelihood ratio[49] and kept all pairs that were significant at a 99.9% confidence level ($\chi^2 > 10.828$), resulting in 1,081 bigram tokens such as "human right," "tahrir squar," "arm forc," and "civil societi" (see Table 5 in the appendix for the most common bigrams).

### Topic model

After cleaning and preparing our corpus, we used MALLET,[50] an open source Java-based implementation of Blei, Ng, and Jordan's LDA algorithm, to generate a topic model with 20 topics.[51] Because of the random nature of LDA's multilevel generative process, the exact composition of topics changes trivially each time the model is built; in this paper we used a random number seed for the sake of reproducibility.

The 20 topics are summarized in Table 3. The first column shows the Dirichlet α parameter for each topic and is approximately equal to the proportion that topic appears in the corpus. The second column lists the top ten most likely words for each topic and is the primary output of the LDA process—these words represent the probabilistic clusters of tokenized words in the corpus, categorized by the underlying latent topics. While the topic model does accurately output clusters of most likely words, detailed knowledge about the corpus is necessary to understand what those topics mean. In the third column, we used our understanding of post-revolutionary Egyptian pol-

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[47] Specifically, we used the Porter English algorithm: Martin Porter, "The English (Porter2) Stemming Algorithm," September 2002.

[48] Soriano, Au, and Banks, "Text Mining in Computational Advertising," 274.

[49] Defined by $-2 \log \lambda = -2 \log \frac{L(H_1)}{L(H_2)}$, where $H_1$ is the likelihood that two words co-occur at random and $H_2$ is the likelihood that the two words are a good collocation, as per Christopher D. Manning and Hinrich Schütze, *Foundations of Statistical Natural Language Processing* (Cambridge, Massachusetts: MIT Press, 1999), 162.

[50] Andrew Kachites McCallum, "MALLET: A Machine Learning for Language Toolkit," 2002, http://mallet.cs.umass.edu; Shawn Graham and Ian Milligan, "Review of MALLET," *Journal of Digital Humanities* 2, no. 1 (Winter 2012).

[51] To increase the model's accuracy we used 1,000 sampling iterations and reestimated its Dirichlet hyperparameters (i.e. the parameters that define the weight and composition of each topic) after 50 iterations initially and every 20 iterations thereafter.

itics and events to create subjective labels of the most likely words generated by the topic model.

| | Dirichlet α | Top ten words | Short name |
|---|---|---|---|
| 1 | 0.987 | egypt egyptian peopl year time ad work group revolut day | Post-revolutionary Egypt (catch-all) |
| 2 | 0.413 | law state articl govern inform right public draft protect bodi | Legislation and governance |
| 3 | 0.261 | protest clash street cairo demonstr report march tahrir_squar activist injur | Protests and clashes |
| 4 | 0.235 | morsi constitut brotherhood member presid parti referendum declar call constitu_assembl | Muslim Brotherhood and constitution |
| 5 | 0.213 | polit mubarak regim power militari islamist egypt scaf brotherhood elect | Muslim Brotherhood and politics |
| 6 | 0.203 | case militari court trial charg human_right investig lawyer civilian scaf | Military trials |
| 7 | 0.185 | media journalist anhri report human_right newspap presid critic accus arab_network | Media and censorship |
| 8 | 0.151 | human_right ngos organ civil_societi fund group organis egypt statement govern | Human rights and civil society |
| 9 | 0.15 | polic secur interior_ministri offic forc attack morsi violenc kill port | Police violence |
| 10 | 0.142 | tortur report prison polic case abus offic victim human_right death | Police torture |
| 11 | 0.116 | arrest children detain releas egyptian detent detaine charg lawyer prison | Police arrests |
| 12 | 0.0988 | govern egypt countri econom tax percent economi price increas polici | Public economics |
| 13 | 0.0776 | worker union strike syndic labor work doctor health state trade_union | Egyptian workers |
| 14 | 0.0746 | women woman men women_right attack femal girl sexual_harass activist sexual_assault | Sexual violence |
| 15 | 0.0683 | compani govern corrupt investor law fund egypt privat asset deal | Business |
| 16 | 0.0637 | vote elect poll_station voter candid campaign report violat judg shafiq | Elections |
| 17 | 0.0567 | campaign revolut univers arab activist stori street bahrain confer uae | Protestors and activism |
| 18 | 0.0531 | christian church copt villag muslim famili coptic home attack saber | Sectarian issues |
| 19 | 0.0492 | azhar religi religion islam baha institut imam channel constitut islamist | Religious issues |

| | Dirichlet α | Top ten words | Short name |
|---|---|---|---|
| 20 | 0.0453 | resid land water area farmer environment plant live hous agricultur | Environmental issues |

Table 3: Topic model summary

Selecting the number of topics is unfortunately one of the most arbitrary decisions in topic modeling, and there is no agreed-upon method for choosing the ideal number.[52] We ran dozens of iterations of the topic model using 5–40 topics and chose the iteration where the number of topics was both comprehensive and not duplicated— topics tended to be overly broad or overly granular when run with more extreme numbers of topics. While 20 topics seemed to subjectively strike the balance between comprehensiveness and granularity, the types of generated topics are similar when running the model with marginally different numbers (i.e. 17 or 22), indicating some robustness to the number of topics selected.

The model's largest topic, labeled "post-revolutionary Egypt," appears in every document in the corpus because it absorbed generic terms related to news coverage of Egypt. Because it is a catch-all category, we have omitted it from most of our analysis. Each of the other topics in the model represent key issues that advocacy NGOs were involved with between 2011–2013, including issues like draft legislation, protests in Tahrir Square, the Muslim Brotherhood's actions in political power, extralegal military trials of civilian activists, human rights abuses by the military and police, and other related topics.

## Model validation and robustness

To validate the accuracy of the topic model, we randomly selected three articles from the corpus to check the proportion of topics they covered (see Figure 3). The first article, "Egypt political forces call for mass 'Eyes of Freedom' rally Friday," published by al-Ahram English on November 22, 2012 (labeled "ahram_44730"), reports on large-scale protests planned in response to President Morsi's constitutional decree granting himself nearly unlimited presidential power. These protests were also planned to coincide with the first anniversary of the military's crackdown on protestors on Mohamed Mahmoud street, where dozens of activists were blinded by military birdshot and live ammunition. The topic model predicts that nearly 50% of the article relates to "Muslim Brotherhood and constitution" (appropriate, given Morsi's constitutional politics) while the remainder discusses protests, legislation, police violence, and ac-

[52] Hanna M. Wallach, David Mimno, and Andrew McCallum, "Rethinking LDA: Why Priors Matter," in *Advances in Neural Information Processing Systems 22*, ed. Y. Bengio et al., 2009, 1973–81.

tivism, all of which relate directly to the story. The model appears to do an excellent job decomposing the article's main topics.
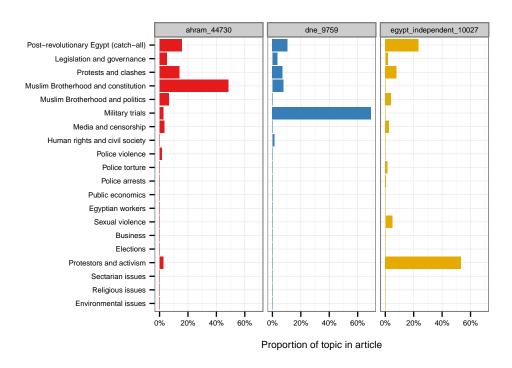


Figure 3: Topic composition of three random articles

The model performs similarly well with the other two articles. "Maspero interrogation continues, virginity checks case adjourned," published by Daily News Egypt on December 13, 2011 (labeled "dne_9759") reports on the trials of anti-SCAF protestors arrested in the in the Maspero protests of October 2011—the topic model appropriately assigns nearly 70% of the article to "Military trials." Finally, on February 2, 2012 Egypt Independent published "Radwa Ashour on the train of images of the Egyptian revolution," (labeled "egypt_independent_10027") a profile of a cultural exhibition at Cairo University featuring photography, art, and poetry about the 2011 revolution. Half of the words in the article were assigned to "Activism," while the rest were placed in categories related to the revolution.

To verify that these publications' coverage of NGO activities is significantly different from their standard daily beats, we built a topic model using the same algorithmic parameters and number of topics using a random sample of 600 articles from the full corpus (200 from each publication), essentially creating a control corpus. The results of this control model are included in Table 6 and Figure 6 in the appendix. The topics

these three publications cover on a daily basis are quite different from its NGO coverage. Both corpora share coverage of more relevant political and economic topics like the Muslim Brotherhood, public finances, and protests, but the control corpus includes coverage of foreign affairs (including the Syrian civil war and the Israeli-Palestinian conflict), regional violence, Cairo affairs, tourism, oil, and football. This control topic model (1) highlights the effectiveness of the LDA method, as each of these topics again reflect actual events that occurred during 2011–13, and (2) demonstrates the usefulness of focusing specifically on NGO coverage. A simple random selection of articles (or even a topic model based on every article in the corpus) fails to show any useful relationship between interest groups, the government, and the independent media. By limiting the scope to a subset of NGOs, we find substantively different topics that allow us to investigate this relationship.

## Interpublication comparisons

Having demonstrated the relative robustness and accuracy of the topic model, we can compare the predominant topics in each of the three publications to see how these organizations differ in their coverage of NGO activities. Figure 4 shows the mean proportion of each topic in each publication, normalized and rescaled so that the proportion of articles in each topic sums to 100%.[53] While this normalization gives a more accurate view of topic coverage across the corpus, it results in very small (though still interpretable) proportions.

State-owned al-Ahram English tends to discuss or mention human rights and civil liberties NGOs when reporting on protests and activism, press freedom, and elections. Mentions of NGOs are fairly common when talking about activist activities, as al-Ahram tends to name the organizations that organize or are involved in protests—for example, in the al-Ahram article used above to validate the model, after discussing protestor grievances, the reporter concludes with a list of all the political parties and NGOs that plan on participating. Al-Ahram also tends to mention human rights NGOs when reporting on issues press freedom because of President Morsi's tendency

[53] An sample three-topic model of a three-article corpus provides an illustration of normalization:

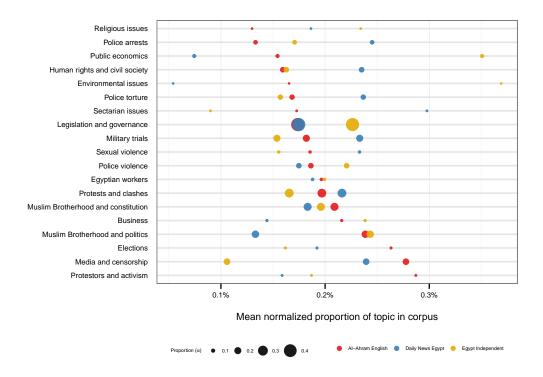| | topic1 | topic2 | topic3 | Row totals | → | topic1 | topic2 | topic3 | Row totals |
|---|---|---|---|---|---|---|---|---|---|
| **Article 1** | 0.5 | 0 | 0.5 | 1 | | 0.45 | 0 | 0.38 | 0.84 |
| **Article 2** | 0.1 | 0.3 | 0.6 | 1 | | 0.091 | 0.5 | 0.46 | 1.1 |
| **Article 3** | 0.5 | 0.3 | 0.2 | 1 | | 0.45 | 0.5 | 0.15 | 1.1 |
| **Column totals** | 1.1 | 0.6 | 1.3 | | | 1 | 1 | 1 | |

Figure 4: Average proportion of topics by publication, sorted by lowest to highest proportion in al-Ahram English

to arrest journalists on charges of "insulting the president." The number of journalist libel lawsuits filed during his term as president "exceed[ed] those filed under all Egyptian rulers since 1892"[54] according to the Arab Network for Human Rights Information (ANHRI), which al-Ahram cites in several articles on this topic. However, mentions of NGOs are neutral in state-run media, as al-Ahram tends to simply mention the NGOs that have complained about lawsuits. Finally, al-Ahram gives NGOs more attention when discussing elections—specifically election monitoring and electoral violations—likely because it ran a special electoral portal during the parliamentary and presidential elections to provide information about candidates.

In contrast, independent publications are far more likely to mention NGOs when covering most other topics in the corpus. Daily News Egypt tends to use advocacy NGOs when reporting on police arrests (generally of activist leaders), human rights and civil society issues, police torture and abuses, military trials (again, generally of

[54]"Egypt's Morsi withdraws all legal complaints against journalists," *al-Ahram English*, April 10, 2013, http://english.ahram.org.eg/News/68953.aspx.

activist leaders), and sectarian and religious issues such as attacks on Coptic Christian churches. Egypt Independent mentions NGOs prominently when reporting on draft legislation, the largest topic in the model, giving a platform for NGOs concerned with legislative initiatives under Morsi's regime—in particular the restrictive draft NGO laws that precipitated the open letter that our subset of NGOs signed. It was a strong platform for coverage of NGO concerns about public economics, especially as the Egyptian government worked to renegotiate terms of its IMF loans. Egypt Independent was also the best outlet for environmental issues and was the only publication to publish anything related to fracking and oil exploration, with direct quotations from several of the NGOs under observation, including the Egyptian Initiative for Personal Rights and the Habi Center for Environmental Rights.

## Interactions between topics

The model can also provide insight into the relationships between topics, allowing us to see which topics tend to appear together. The dendrogram in Figure 5 highlights the correlations between topics,[55] clustering the most related topics together. The stacked bars to the left of the dendrogram show the proportion of each topic in each publication, rescaled to fit between 0–100% for better visual emphasis.[56]

The figure shows four logical clusters of topical "cousins"—topics that tend to co-occur in individual articles in the corpus (shaded in grey and white). The top cluster includes reporting on two subclusters related to the Egyptian economy and politics: (1) private sector business, worker and union action, and environmental issues, and (2) Morsi-era politics and public finance. This cluster indicates that the two independent publications tend to report on NGO responses to the post-revolutionary Egyptian economy more than state-run media. The second cluster deals more directly with politics, covering legislation, constitutional debates and politics, elections, and human rights and civil society. The fact that human rights issues tend to be reported in the context of post-Mubarak politics is reflective of the missions of the subset of advocacy NGOs—these organizations focus on the political arena (and are subsequently mentioned by the media) because they attempt to be involved in and improve the policymaking process. Again, with the exception of electoral coverage, independent media tends to give more of a voice to NGOs than state media when covering these issues.

The third cluster is composed of social issues such as religion, sexual violence, and freedom of speech—topics of interest for many advocacy NGOs. Daily News Egypt and Egypt Independent cover many of these topics more than al-Ahram, with

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[55]Clustered using Ward's minimum variance algorithm.

[56]Hence the absence of environmental coverage in Daily News Egypt, which had the lowest coverage of any topic in any publication.
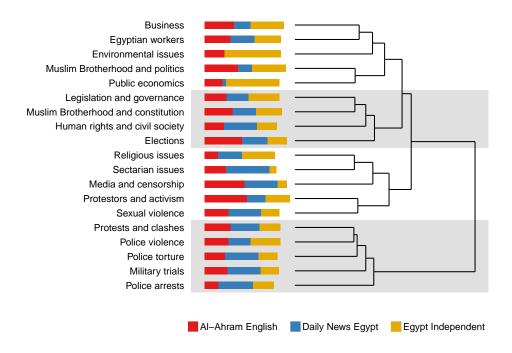
Figure 5: Topics that are more likely to be covered with other topics (shading indicates clusters of topical "cousins")

the notable exceptions of media and censorship and activism. However, as explained previously, al-Ahram's coverage of Morsi's censorship campaign tends to consist of token statements from anti-censorship NGOs. Their coverage of revolutionary activism follows a similar pattern, tending to name groups that organize protests, but not necessarily quoting these organizations. The final cluster deals with post-revolutionary violence and includes reporting on protests and clashes, military trials, and police violence, arrests, and torture—a logical grouping, given that when a publication reports on protests, it tends to also report the police and military responses to those protests. Perhaps not surprisingly, the two independent publications tend to give voice to advocacy NGOs when covering state violence more than state media.

## Conclusion

As discussed above, and seen in Figure 1, NGO activities are more likely to be covered in independent media rather than in state-run media and are more likely to be used as sources in reporting. The analysis finds that ownership of the news publication in-

fluences which sources reporters turn to when covering events, contributing to recent evidence showing that source choice matters in the coverage of a story, with studies finding that non-elite (non-official and non-governmental) news sources had greater influence in one reporter's coverage of stories during the Arab Spring,[57] and that the sources used by different types of news sources resulted in news on the same topic or event that was actually different.[58]

There is also a difference in the way independent and state-run media talk about NGOs. Independent media tend to mention NGOs when covering police, military, and government abuses of power, civil rights issues such as sexual harassment, and religious and environmental issues. These topics are accompanied with anecdotes from NGO spokespeople, in part confirming recent research finding that that when media cover social issues, they tend to emphasize individual faces and stories rather than the broader discussion about underlying causes that NGOs—as social movement representatives—might provide.[59] In contrast, state-run media mention NGOs when discussing less socially salient topics, such as elections, and even when discussing potentially salient topics like media and censorship or activism, their reporting tends to be less personal and more explanatory than independent media coverage.

Topic modeling with LDA can provide powerful insights into large collections of text and can be successfully used in many other applications in international relations and communications research. For example, given our extensive corpus, there is a wealth of questions that we can investigate in the future that will shed further light on the issue of NGO sourcing in independent and state-run media. Our current topic model takes a synchronic approach where our analysis is not time-bound. By looking at topics diachronically, or with respect to time, we can see how topics might change in temporal proximity to protests—do publications cover NGOs more or less often, or in different ways, around key trigger events?

Finally, while the actual intentionality of either the media or the NGOs is not measurable through this method, there can be some observations about the a relationship between these actors as they both navigate the situations and events playing out in the Egyptian social and political sphere.

First, though a small proportion of the total number of articles include references to NGOs, it seems that the media are the driving force in which ones are used and how they are used. There are differences in the topics that the state-run and independent

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[57] Seth C. Lewis, Rodrigo Zamith, and Alfred Hermida, "Content Analysis in and Era of Big Data: A Hybrid Approach to Computation and Manual Methods," *Journal of Broadcasting & Electronic Media* 57, no. 1 (2013): 34–52.

[58] Peng Kee Chang et al., "Framing the Relationship Between Government and NGOs in Selected Malaysian Chinese Newspapers," *Innovation Journal* 16, no. 3 (2011): 1–18.

[59] Sabine Lang, *NGOs, Civil Society and the Public Sphere* (Cambridge: Cambridge University Press, 2013), 128.

media use NGOs for, indicating that each reaches out to different NGO sources for the same stories. While both types of media outlets may cover the same events, the will do it in differing ways, targeting the NGOs that will confirm their version of events. This observation lends some support for the idea of asymmetrical dependency.

Second, LDA topics provide an empirical foundation for issue framing. News frames are notoriously difficult to identify and problematic outside individual anecdotes and cases. With the topics, identified over a period of time, it is now possible to look for a connection between those identified in media sources and those which represent the NGO messages.

This leads to a third observation: while the foundation has been laid to apply Gamson and Wolfsfeld's model for social movement uses of the media, there needs to be a second step of comparing the stated goals of the NGOs with the perspectives (topics) that show up in the media coverage. But, this is doable.

Finally, we might also examine the NGO message sources that are not in the media, such as web sites, social media groups and microblogging.

The systematic categorization and evaluation of NGOs as sources and topics in Egyptian media coverage over this time period lays the foundation for further analysis of this relationship.

## Software

All the graphs, tables, and model results can be replicated using code available at https://github.com/andrewheiss/Media-and-NGOs and the following open source software:

McCallum, Andrew Kachites. "MALLET: A Machine Learning for Language Toolkit," 2002. http://mallet.cs.umass.edu. Version 2.0.

R Core Team. *R: A Language and Environment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing, 2013. Version 3.0.2.

Rossum, Guido van, et al. "Python programming language." Python Software Foundation. http://www.python.org. Versions 2.7.5 and 3.3.2.

Wickham, Hadley. *ggplot2: Elegant Graphics for Data Analysis.* Springer New York, 2009. Version 0.9.3.1.

# Appendix

Corpus processing

| -2 log λ | Word 1 | Word 2 |
|---|---|---|
| 18508.83 | human | right |
| 6080.67 | initi | person |
| 5495.26 | muslim | brotherhood |
| 5451.36 | civil | societi |
| 4724.39 | tahrir | squar |
| 4353.86 | poll | station |
| 4197.67 | egyptian | initi |
| 4154.52 | person | right |
| 3484.30 | hosni | mubarak |
| 3362.91 | arm | forc |
| 3336.52 | virgin | test |
| 3102.96 | constitu | assembl |
| 3085.57 | secur | forc |
| 2942.99 | ahram | onlin |
| 2743.44 | interior | ministri |
| 2640.64 | moham | morsi |
| 2603.64 | press | confer |
| 2428.86 | suprem | council |
| 2374.62 | 25 | januari |
| 2307.85 | arab | network |

Table 5: Top 20 bigrams

## "Control" corpus topic model

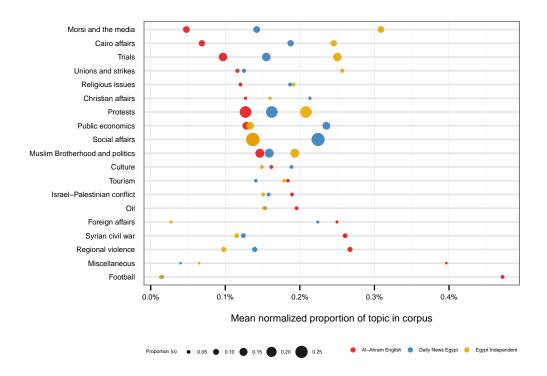|    | Dirichlet α | Top ten words | Short name |
|----|-------------|---------------|------------|
| 1  | 0.725 | egypt egyptian state govern countri nation includ support presid end | Egypt (catch-all) |
| 2  | 0.27 | peopl time year social work make revolut find world problem | Social affairs |
| 3  | 0.233 | protest polic clash peopl demonstr violenc report day friday sunday | Protests |
| 4  | 0.17 | parti elect vote morsi member polit brotherhood parliament constitut islamist | Muslim Brotherhood and politics |
| 5  | 0.16 | court case lawyer charg investig trial arrest accus releas mubarak | Trials |
| 6  | 0.144 | egypt govern econom year billion percent invest bank fund countri | Public economics |
| 7  | 0.118 | morsi report parti presid newspap own media minist paper journalist | Morsi and the media |
| 8  | 0.108 | citi cairo port water hospit road health governor airport author | Cairo affairs |
| 9  | 0.0804 | attack kill offici iraq bomb year govern wound raid libya | Regional violence |
| 10 | 0.0727 | syria syrian rebel iran assad damascus border forc iranian turkey | Syrian civil war |
| 11 | 0.0579 | student ministri syndic worker univers union doctor strike educ movement | Unions and strikes |
| 12 | 0.0516 | team club game player footbal ah play match 1 coach | Football |
| 13 | 0.0513 | oil gas year fuel export price energi product suppli chavez | Oil |
| 14 | 0.0502 | music art artist film work cultur perform egyptian award cairo | Culture |
| 15 | 0.0495 | azhar islam religi muslim institut sheikh law author religion women | Religious issues |
| 16 | 0.0486 | israel isra palestinian gaza sinai hama bedouin oper prime_minist bin | Israel-Palestinian conflict |
| 17 | 0.0432 | camel china hotel day restaur japan man chines indian japanes | Tourism |
| 18 | 0.0392 | church vote voter pope christian coptic bishop poll_station poll select | Christian affairs |
| 19 | 0.031 | world_bank put british sxsw obama thatcher romney currenc centuri gold | Foreign affairs |
| 20 | 0.0203 | men 11 1 finish 3 2 6 egypt 4 0 | Miscellaneous |

Table 6: Topic model summary

Figure 6: Average proportion of topics by publication, using control corpus, sorted by lowest to highest proportion in al-Ahram English)

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