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<div align="center">Inspire Illuminated:
An interactive visualization of al-Qaeda's *Inspire* magazine</div>

Introduction

  Inspire is an online English-language magazine published by the militant group al-Qaeda in the Arabian Peninsula (AQAP), a Yemen-based affiliate of al-Qaeda implicated in numerous deadly terrorist attacks since its founding in 2009. The magazine is not only a propaganda outlet for AQAP, but also a branding and recruiting tool for the entire al-Qaeda franchise. The magazine has been connected to multiple domestic terrorist plots in the West; the Boston Marathon bombers are believed to have used a bomb-making recipe from the magazine, and multiple would-be attackers were found to have read *Inspire*[1].

  My project is an interactive visual exploration of various aspects of this particularly salient terrorist publication. The specific questions that I answer in this visualization are:

1. What categories and topics do the magazine cover and how does the coverage vary across issues?

2. Who are the main contributors to the magazine?

3. How much of the magazine's content is original? Specifically, what proportion of articles are written specifically for Inspire and what proportion are drawn from other sources?

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[1] Lemieux, Anthony F., Jarret Brachman, Jason Levitt, and Jay Wood. "Inspire Magazine: A Critical Analysis of Its Significance and Potential Impact through the Lens of the Information, Motivation, and Behavioral Skills Model." *Terrorism and Political Violence* 1, no. 1 (2014): 1–18. doi:10.1080/09546553.2013.828604.

The answers to these questions hold practical implications for counter-terrorism scholars and officials, but the visualization also provides an accessible and relatively non-alarmist glimpse into terrorist messaging for all members of the public.

Methods

Data

In April of 2017, I downloaded each issue of *Inspire* from the online propaganda archive at Jihadology.net[2]. Between April and May I looked through each issue and hand-coded each item[3] to construct the following variables:

- **Issue** – Issue number (1 – 16)
- **Section** – Section title (or item title when a section heading is not provided)
- **Page** – Page number where the item begins
- **NumPages** – Number of pages (rounded to the nearest 0.5)
- **ItemTitle** – Item title
- **ItemType** – Category; one of 12 groups (discussed below)
- **OriginalContent** – Dummy variable indicating whether the item meets the criteria for original content; equal to 1 if it meets the criteria and 0 if it fails to meet the criteria (discussed below)
- **AuthorName** – Name of the author
- **AuthorTitle** – Any title given to or used by the author (e.g. "Dr.", "Sheikh")

For ItemType, each item was categorized into one of the following:

- **Ideology** – Written pieces that seek to explain, clarify, justify, promote, or enforce the group's political or religious ideology. These primarily include religious sermons, messages to the public and/or enemy governments, and addresses by group leaders calling for jihad. Very short messages accompanied by graphics are considered Advertisement rather than Ideology.
- **How-To Guides** – Guides and tutorials for carrying out acts of terrorism. Each issue typically has an Open Source Jihad section that deals with domestic terrorism, with guides on bomb-making, weapon usage, and covert communication. Some issues also have travel guides that discuss best practices for waging jihad abroad.

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[2] Zelin, Aaron Y. "Inspire Magazine." A clearinghouse for jihādī primary source material, original analysis, and translation service. May 08, 2017. http://jihadology.net/category/inspire-magazine/.

[3] I define an item as an article, advertisement, factoid, statement, or any other work separable from the rest of the magazine, usually by having a distinct title, section heading, subject matter, or artistic style.

- **News** – Official statements from al-Qaeda and descriptions of current events. This category also includes sections dedicated to quotes from enemy actors, media outlets, and members of the public.
- **Advertisement** – Product placements and other ads. Typical product placements are for upcoming interviews and new video releases. Other ads are typically propaganda posters encouraging violence or making fun of enemy leaders.
- **Opinion** – Opinion pieces typically placed under an "Opinion" heading. These reflect the thoughts opinions of individual writers rather than the group's official position. Writings by deceased or current group leaders and prominent ideologues (e.g. Usama bin Laden, Anwar al-Awlaki, Samir Khan) were generally considered to reflect the official AQAP position and thus not placed in this category.
- **Strategy** – Writings that reflect the group's military strategy. This category includes military analysis of operations and discussions of the group's overall military strategy or favored tactics. It also includes hit lists and other calls for specific violent acts against the enemy.
- **Eulogy/Martyrology** – Writings that praise and commemorate deceased or imprisoned individuals considered to be martyrs for the cause. These do not include poems commemorating martyrs, which are included in the Art and Poetry category instead.
- **Art and Poetry** – Mainly poems and photography. Also includes short stories.
- **History** – Historical analysis and timelines.
- **Testimony** – First-person narrations by group members. These typically deal with their experiences in jihad and reasons for joining AQAP.
- **Interview** – Interviews with prominent group members.
- **Other** – Responses to inquiries by readers, general life advice, and other miscellaneous items.

OriginalContent was coded as NA for all items that contained minimal text or were not primarily textual in nature, such as advertisements, photographs, timelines, or hit lists. For all other items, OriginalContent was coded as 0 if the author was deceased for at least several months at the time of publication or if the item cited a previously published work or external source, such as a book, sermon, or news article. Otherwise, it was coded as 1.

Visualization design

I decided to deliver my visualization via a website rather than a research paper or web application, for two reasons. First, one of the major goals of my project is to deliver a product that is reader-friendly and accessible to members of the wider public, not just the highly educated

or technically savvy. Second, using Github Pages to build a website allows for a simple but attractive design with multiple sections, much like a dashboard app.

In terms of the overall look of the visualization, I employed a theme of "illuminating" – figuratively in the sense of generating insight, and literally in the sense of being bright and luminous. Symbolically, this represents a rejection of the "dark" aspects typically associated with reactions to terrorism, such as fear and prejudice. So instead of accommodating the darkness of the subject, I contrast against it with a bright white background and cheerful coloring.

Other than the colors and shapes, the graphs were designed to minimize the ink-to-paper ratio. I removed most of the gridlines and designed the graphs such that each expressed only one or two pieces of information at the same time, at least in their static form. This contributed to the "illuminated" effect by maximizing the amount of white space and focusing more attention on the colored parts of the graph.

The use of interactive elements balances against the graphs' simplicity, and helps to engage the reader. I used ggplotly and htmlwidgets to enable features such as zooming, panning, and hovering over parts of the graph for additional information. For the timeline and featured authors chart I added longer descriptions that provide substantial context regarding the subject matter.

Results

Magazine content

Of the twelve categories I considered, writings dealing with ideology and "DIY terrorism" how-to guides take up the most number of pages across all issues, at 22.7% and 18.8% of all pages, respectively. News takes up 11.8%, and other categories take up less than

8%. This finding is not surprising, as AQAP is, in fact, an ideology-based organization that seeks to incite a global uprising against the powers of the West. However, it may come as a surprise that a propaganda magazine would include poetry and advertisement. In fact, other than its deeply ideological and pro-violence bent, much of *Inspire* reflect the form and content of traditional publications.

Analyzing the distribution of categories across issues reinforces these findings, although the share of pages by each category fluctuates from one issue to the issue. Ideology and How-To guides maintain a sizable share relatively consistently. Other categories also generally maintain a share from one issue to the next, though at a smaller scale. Also, the length of issues differs significantly from one issue to the next. Shorter issues, such as issue 7, appear to contain more (share-wise) of the less prominent categories such as Art and Poetry. The fluctuation in content and volume over time suggests an unstable production environment caused by either experimentation or instability within the group itself. For example, the composition and length of issues may change as key figures are killed and others replace them. That the magazine is not published on a regular, predictable basis, as demonstrated in the table and timeline in the About section, also suggests instability in the production process.

Question 2: Who are the main contributors?

Not counting individuals featured in quotes sections, there were over 90 presumably distinct, individual authors who had their works featured in *Inspire*. Of these, I examined 23 authors who were featured three or more times.

Of the top authors whose identities are known, most are or were leaders within the al-Qaeda network. Usama bin Laden, Ayman al-Zawahiri, Abu Yahya al-Libi, and Adam Gadahn,

are or were part of al-Qaeda Central's leadership, ostensibly standing as the voice for the entire al-Qaeda franchise. Anwar al-Awlaki, Samir Khan, Harith al-Nadhari, Nasser al-Anisi, and Ibrahim al-Rubaysh are or were leaders or otherwise key figures within AQAP. Abu Musab al-Suri is a well-known military strategist with ties to al-Qaeda. The prevalence of writings by top leadership suggests an overall top-down approach in AQAP's overseas strategy, at least in spirit. Rather than encourage diverse discourse and new voices, *Inspire*'s producers appears to prefer maintaining and encouraging readers to toe a party line.

Also, while most of these writers are native Arabic speakers, a significant number are fluent in English. Anwar al-Awlaki, who lived for years in the United States, had attracted a large international following with his English-language audio series and lectures on Islam. It is not surprising that he is the most featured writer in the magazine. Samir Khan spent most of his life in the US and was relatively well-known as an English-language propagandist. Some of the lesser known or anonymous writers in the list may also potentially have Western backgrounds.

Question 3: How much of the content is original?

A majority of works in *Inspire* from one issue to the next are previously unpublished content, presumably written specifically for Inspire. This suggests, at the least, a moderate capacity to generate or solicit new content from one issue to the next. Although the producers of *Inspire* are evidently unable to publish on a consistent monthly or even bi-annual basis, they can still generate enough new works so that each issue is more than just a rehashing of old content.

At the same time, the percentage of items that are borrowed from external sources is still significant, ranging from 8.7% to 40% per issue. However, this does not necessarily imply lack of originality or resourcefulness, for at times the use of externally sourced material may be

desirable. For example, the inclusion of writings or speeches by dead leaders such as Usama bin Laden may be deemed necessary by AQAP's leadership or the producers to maintain a consistent ideological stance among readers. In addition, each issue of Inspire typically contains one or more sections containing quotes from the media, prominent individuals, and members of the public. These quotes efficiently sum up AQAP's narrative of global attitudes toward AQAP, *Inspire*, al-Qaeda, and the jihadist struggle in general, and being "straight out of the horse's mouth," the implied narrative appears legitimate.

Discussion

I discuss below how this visualization meets Cairo's five qualities of a great data visualization.

Truthful

While the underlying data is not perfect, I include all the data files and describe at length how items were coded. In addition, I do not rely on secondary interpretations but draw on the original magazine documents. I labeled the graphs with appropriate titles and axis labels. To my knowledge, I used consistent axis scaling and did not manipulate any other parts of the graphs to create the appearance of something not present in the data. The only exception is the stream graph showing the distribution of categories over issues, which gives the appearance of smooth, continuous changes between issues whereas the issues are categorical rather than continuous. This was done for aesthetic purposes. To prevent misinterpretation I provide a written description to provide context.

Functional

The visualization employs an easy-to-use web interface, organized into separate sections for each topic, and the plots are interactive, allowing for a variety of functions including zooming and hovering over parts of the graphs for more information. I use the latter function to provide detailed information on aspects of each graph, such as events surrounding the publication and the identity of frequently featured writers.

The least functional graph is the category stream plot, which depicts number of pages per category in each issue in a stacked area plot rather than a line graph. Because there are many categories, it is difficult to meaningfully compare the areas relative to each other. The choice was again made for aesthetic purposes, as a line plot with the same number of categories looks less elegant.

One may also question the necessity of having a stacked bar chart with new categories for the original content graph, when a standard bar chart with only one category (either Yes or No) would have communicate the same information. This was again for aesthetic purposes, since the dark purple along the top creates an interesting contrast to the yellow along the bottom. The look also creates an impression of an ongoing duality between original and borrowed content, rather than simply the presence or absence of either.

Beautiful

I believe the visualization meets the goal of the "illuminated" theme. Although there was no set color scheme unifying all the sections, all the graphs are characterized by bright and cheerful colors surrounded by plenty of white space. In fact, I believe the variety of colors and contrasts help create an even more positive atmosphere. With the exception of the stream graph, I used ggplotly for all to create a uniform look.

Insightful

The different components of the visualization provide a variety of insights, and communicates clearly the findings presented in the Results section. For example, the prevalence of ideology-related writings and how-to guides is readily apparent in the aggregate content lollipop chart. This information is more clearly communicated by the ordering of the categories in order of most prevalent to least prevalent.

Enlightening

While not all may agree with the usefulness of visualizing a terrorist magazine which relatively few individuals read and perhaps nobody should read, I argue that my visualization is enlightening because it sheds light on a subject that is little understood but holds significant importance for public safety and policy. While the conclusions drawn are tentative and rudimentary, by exploring the topic in a scientific, non-partisan, and non-alarmist way, it opens the way to more level-headed analysis of terrorist messaging.