Holding the LINE:
The US Role in Combatting Information Warfare in Taiwan's Electoral System

Maggie Baughman

In a Tortoiseshell: *In her politics paper, Maggie Baughman recommends a specific set of policies for the US State Department to follow in order to combat the spread of misinformation by the Chinese government within Taiwanese election cycles. Her* ***thesis*** *is built upon a unique and compelling* ***methodology*** *combining epidemiological theory with politics. By manipulating multiple forms of* ***evidence*** *as well as the* ***framework*** *of her argument, Maggie also renders her thesis both pragmatically and pedagogically* manageable.

Excerpt

This paper will first explore the trends of Chinese information warfare (IW) campaigns in Taiwan under Xi Jinping by analyzing shifts in political rhetoric, then explore China's current IW strategies and capabilities, in order to develop a model to predict likely IW trends after the 2020 elections. Secondly, it will unpack the consequences that Chinese electoral interference in Taiwan has for the United States, focusing on Taiwan not only as a US partner, but as a testing ground for Chinese interference, in order to understand why IW in Taiwan should be a US national security priority. Finally, it will propose specific, targeted policy countermeasures that DRL should implement in order to protect the democratic order in Taiwan.

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This analysis presents a policy recommendation centered on viewing information warfare, primarily propaganda, through the lens of a disease model. This tactic is a direct response to the development of a Chinese model of information psychological warfare using the susceptible-infected-recovered-susceptible (SIRS) model of disease transmission within a population.[1] This

[1] 王洋 et al., "信息心理战理论模型以及量化模型探讨," 指挥控制与仿真 30, no. 4 (August 2008). Conceptualizing the transmission of cyber-attacks as comparable to the spread of a pathogen can be traced back almost half a century, to the coining of the term computer "virus" in the 1980s. The modern

SIRS epidemiological model is common in the field of public health, and identifies how epidemics sweep through a population based on interpersonal transmission rates. This conception of propaganda as an epidemic allows for the use of tactics developed for disease control as a response to IW, translating a long-standing, effective public health system into the IW sphere. Beyond the specific recommendations presented here, which focus on "diagnosing cases" of IW and tracking "strains" of misinformation, this model can be extended to provide new insights into ways we can use existing public health systems to address IW campaigns.

The traditional SIRS model proposes three pools of individuals within a population of size N: the susceptibles (*S*), the infecteds (*I*), and the recovereds (*R*). Individuals move from a susceptible population to an infected population through disease transmission, recover after a set period of time, and are again susceptible to new strains of the disease. Parameters measure the flow of individuals from *S* to *I* (infection), *I* to *R* (recovery), and *R* back to *S* (loss of immunity). Chinese military scholars published widely cited papers proposing the use of this model to design information warfare that exerts psychological pressure on soldiers. In this model, the *S* pool indicates psychologically well soldiers, the *I* pool indicates soldiers experiencing psychological pressure, and the *R* pool indicates recovered soldiers who are (temporarily) immune to further information warfare attacks.[2]

While Wang suggests that to design effective IW attackers should attempt to increase various parameters (number of contacts, rate of infection, rate of recovery), these recommendations seek to both quantify and alter the parameters, focusing specifically on rates of "transmission" (in this case, the rate at which individuals experience psychological pressure by

concept of a computer virus is actually modeled off of "internet worms," which self-replicate and spread copies across a network. The mental model of cyberwarfare as a form of disease followed from this discovery, as "worms" were tracked, modeled, and contained with similar processes to containing disease outbreaks.

[2] 王洋 et al., "信息心理战理论模型以及量化模型探讨," 指挥控制与仿真 30, no. 4 (August 2008). See Appendix for diagrams.

IW tactics). The measures proposed here allow for a better understanding of how the IW "strains" move through and "infect" the population and provide preliminary attempts to slow the rate of infection. The first step in disease containment is diagnosing cases of the disease, a notion that translates well to identifying misinformation and disinformation on the internet. The second step is tracing chains of infection to find "patient zero" and infected individuals - in this case, building off of a database of individual cases to track strains of information warfare through different sources.

I. Policy Recommendations

Recommendation 1: ***DRL cosponsors a hackathon dedicated to improving LINE-based misinformation detection tool "Cofacts" with contributors from Taiwan's civic engagement "white-hat hacker" community, g0v, through a partnering nonprofit, the Open Community Foundation (OCF).***

Public reliance on LINE marks a particular challenge to countering misinformation because LINE messages are private, and therefore are not run through the same sets of fact checking and misinformation algorithms that Facebook has implemented and refined since 2016.[3] As a result, the automated warning systems that can be used to reduce misinformation on platforms like Twitter and Facebook must be replaced by other mechanisms for sites like LINE. One organization in Taiwan has created a preliminary diagnosis tool, but has not reached any level of technical sophistication, and has not reached a critical level of public buy-in. G0v (read as "gov zero") is a "decentralized" civic hacker community that turns technical expertise towards civic engagement. With more than 1,000 volunteer contributors, the g0v community is 40% coders, 10% designers, 20% NGO workers and civil servants, and 30% private citizens.[4] The organizational power of the community, however, falls to a nonprofit, nonpartisan group called

[3] Hannah Murphy, "Inside Facebook's Information Warfare Team," Financial Times, July 6, 2019, https://www.ft.com/content/70b86214-9e77-11e9-9c06-a4640c9feebb.
[4] "Who We Are," g0v, accessed January 4, 2020, http://g0v.asia/#section-7.

the Open Community Foundation (OCF), which assists in connecting g0v contributors to international organizations, including AIT.[5]

G0v has undertaken various projects that support democracy, Internet freedom, and good governance through crowdsourcing technological expertise.[6] Among these projects is Cofacts, a crowd-sourced hoax identification tool for LINE, which allows users to submit messages for community fact checking. These messages are uploaded to a discussion board, where verified editors communally confirm the veracity of the information.[7] Through crowdsourcing both data collection and information verification, Cofacts builds and relies on public investment in countering disinformation. However, Cofacts currently relies upon 12 volunteer editors to fact-check the submitted messages, and only receives about 210 messages a week.[8] Without a significant submission base, Cofacts cannot gather any reliable information on trends within the submitted messages, or make a dent on the scope of the misinformation problem. As a result, the project has lost steam and has been fairly inactive since the middle of 2019.[9]

The recommendation proposes that DRL, through existing AIT connections, collaborate with OCF and g0v contributors to sponsor a "hackathon" dedicated to improving Cofacts' user-friendliness, publicizing it in a broader social media environment, and brainstorming heuristics to predict whether a submitted news story is factual. The hackathon's overarching goal is developing tools to automate a currently low-tech tool. The event will be open to the Taiwanese public (requiring only Taiwanese citizenship, to be verified with electronic identification cards, eIDs), and will draw on the significant membership of technological experts in the g0v community

[5] "2018 Annual Report | Open Culture Foundation | Open Culture Foundation (OCF)," OCF Taiwan, accessed January 4, 2020, http://ocf.tw/en/p/2018/.

[6] "活動一覽 | 財團法人開放文化基金會 (OCF)," accessed November 22, 2019, http://ocf.tw/journal/.

[7] MrOrz, "Cofacts - Collaborative Fact-Checking System," accessed November 22, 2019, https://cofacts.g0v.tw.

[8] Ibid.

[9] "快速上手「真的假的」 | 真的假的 / Cofacts | Hackfoldr," accessed November 22, 2019, https://beta.hackfoldr.org/cofacts.

(the data is not sensitive – it is already open-source).[10] G0v already hosts bimonthly hackathons, usually with partnering organizations through OCF, and has amassed a significant following.[11] Harnessing the g0v community knowledge to revitalize Cofacts will allow the organization to gain credibility and publicity within Taiwan's technology sphere.

This proposal is feasible, affordable, creative, and community based. The proposed event relies on established community expertise and organizing power, and builds on the foundation of a project that has already been created – and is already open source.[12] Hackathons require only a few days of funding, but harness an immense amount of volunteer manpower and creativity in a civically minded, technologically advanced population. These communities have local and technical expertise that DRL cannot match. Through publicity on AIT, OCF, and g0v platforms, the event itself will serve as publicity for Cofacts, and will hopefully expand its user base. Finally, this hackathon would harness and promote community investment in civic projects, reinforcing agency in combatting the spread of propaganda.

US implementation of this project would be simple. DRL will provide funding to g0v to host and publicize the hackathon, and collaborate with organizers to design the materials and tasks given to participants. First, DRL should work through AIT to reach out to OCF and g0v with a proposal to host a hackathon dedicated to improving Cofacts. DRL would offer connections to US technical experts, funding assistance, and publicity efforts, working with the local connections that AIT has already established. US technical experts (particularly academics or members of companies that have successfully implemented plans to combat misinformation, like Twitter and

[10] "Cabinet Approves New Electronic Identification Card Plan," News Channel, Focus Taiwan, August 22, 2019, http://focustaiwan.tw/news/aipl/201908220008.aspx.

[11] "活動一覽 | 財團法人開放文化基金會 (OCF)," accessed November 22, 2019, http://ocf.tw/journal/.

[12] "快速上手「真的假的」 | 真的假的 / Cofacts | Hackfoldr," accessed November 22, 2019, https://beta.hackfoldr.org/cofacts.

PolitiFact) may be invited to advise on organization and serve as speakers at the event.[13] However, US involvement may draw suspicion and accusations of bias to the event, so it should be largely limited to funding and preparation.

Recommendation 2: ***DRL works with the Bureau of Conflict and Stabilization Operations' Advanced Analytics Team and the Global Engagement Center to develop an open-source "Case Tracker" of misinformation strains that builds on the Cofacts database. This tracker will trace the spread of individual cases of misinformation and disinformation back to their sources.***

The drawback with the Cofacts model is that it diagnoses a single "case," rather than identifying the origins of the (mis)information. Tracking a case of misinformation back to its origins can provide valuable information. It can indicate how the information is spread, who spreads the information, what platforms are commonly used to seed stories, and what other cases may have stemmed from this original instance. For example, China is known to use content farms to seed stories into more mainstream media.[14] Tracking a story from a social media account, to a mainstream media source, to a content farm may allow for the identification of sites that should be flagged as producers of misinformation, as well as media sources that are commonly early on in the "chain of infection" – that is, they picked up the fake news story early, and passed it on to others. Identifying these producers and early reporters, then publicizing their behavior may promote better journalistic standards, cause other outlets to be skeptical of information gleaned from those sources, and generally reduce the spread of propaganda.

[13] "The Principles of the Truth-O-Meter: How We Fact-Check," PolitiFact, accessed January 6, 2020, https://www.politifact.com/truth-o-meter/article/2018/feb/12/principles-truth-o-meter-politifacts-methodology-i/.
[14] Yu-Hua Chen, "China's Meddling in the 2018 Taiwan Local Election," *Asia Dialogue* (blog), December 20, 2018, https://theasiadialogue.com/2018/12/20/chinas-meddling-in-the-2018-taiwan-local-election/.

DRL should work with technical experts within the State Department to create a public, open source "case tracker" that builds on Cofacts as a diagnosis tool. The tool will track recurrences of the same false story or message in Cofacts' database in an effort to map, trace, and eventually, contain the spread of individual propaganda "strains." The final product should map instances of prominent false stories through news outlets, social media, and websites to find the original propagator of the misinformation.[15] Crucially, the case tracker would release open-source data on the "cases" and "strains" of propaganda, and publish user-generated models of the data – in essence, crowd-sourcing data analysis.[16]

DRL should work in collaboration with the Advanced Analytics office in the State Department's Bureau of Conflict and Stabilization Operations (CSO/AA), and in partnership with the Department's Global Engagement Center (GEC). These two organizations frequently partner to develop both internal and public products to present electoral trends, global influence, and conflict. The two offices represent the State Department's most experienced programmers and data scientists, who are the best equipped to develop this project. Crucially, CSO and GEC already work extensively with DRL, and have aligned missions, which will allow for development of the project to DRL's specifications.

Locating this project within the State Department, rather than contracting out to local stakeholders, allows for better oversight of the project and utilization of the Department's existing resources (in terms of data, technology, and manpower). Partnering with other Bureaus allows for pooling resources and researchers, developing a team with a strong regional and technical

[15] This project is intended to be an amalgamation of Twitter's information manipulation project and WeChatScope, a tracker of censored WeChat posts (albeit manual rather than automatic, given the limitations of LINE). It attempts to mimic the success of these two projects, but through harnessing crowd-sourcing, rather than scraping and mining algorithms.

[16] This project in some ways mimics D3, an open source library for JavaScript visualizations that allows users to share their own visualizations. It also will attempt to replicate the success that the data science community had visualizing and analyzing tweets from Chinese state-run bots in Hong Kong – a project that allowed Twitter to find more state-run media accounts, and publicized the methods and patterns of Chinese bots in the social media sphere.

background. The tracker itself will allow the State Department and other US entities to better understand IW trends in Taiwan but will also be publicly available. The public product will represent the US commitment to combatting Chinese IW and will allow for members of the public to use the data. The US should consider projects like this an experiment in combatting information warfare and an investment in countering disinformation and misinformation.

Author Commentary

Maggie Baughman

Writing a Woodrow Wilson School Task Force Policy Memo was a unique challenge for me in my academic research career, because it represented translating traditional pedagogy into a new context and managing novel requirements and constraints. While my academic writing in the first two years of my Princeton experience challenged me to find relevance and meaning in texts and disciplines that felt distanced from practical application, WWS Task Forces call upon students to make relevant, timely, cost-effective, and deeply practical policy recommendations for real-world clients. This paper was my final policy recommendation for a task force on "China and the Rule of Law," where we presented research to clients at the State Department's Bureau of Democracy, Rights, and Labor (DRL). Our task was to identify the most pressing issues in China-US relations concerning the rule of law and find a place where the US could make forward progress. The scope of this task was both incredibly broad—there are enumerable issues in this sphere, and for each issue, enumerable engagement methods—and deeply limited: we had to consider the resources available to our client and their scope of influence in the US foreign policy sphere.

I identified China's information warfare in Taiwan's electoral system as a topic I wanted to research while interning at the State Department last summer. As elections approach around the globe in 2020, I was struck by the importance of information control and social media in preserving (or threatening) democratic systems, and by how little academic research was available on interference in Taiwan's elections. Choosing a focus, however, did not mean that the creation of a thesis was in any way straightforward.

I began with the intent to create policy recommendations to combat disinformation in the lead-up to Taiwan's elections, which required a review of existing research on that topic. After months of research, I constructed a fairly comprehensive picture of China's interference in Taiwan—my contribution to the conversation being the compilation of existing research into an overarching picture. However, three days after submitting my outline, my Google Alert for the topic signaled that a new paper had just come out—a paper that cited all of the same sources, with the same goals and conclusions as my outline! This necessitated my first pivot: rather than focusing on the *lead-up* to the 2020 elections, I altered my paper to concentrate on what the US should do in the *wake* of the elections, as China's tactics responded to their outcomes.

This adapted motive represents a continuity in the writing process sparked by entirely new considerations: practical applications. Faced with real-world clients and a pressing time frame, I was unable to approach questions from a purely academic or theoretical angle. I had to adapt my academic approach (and my comfort zone) to fit a changing policy environment. Thus, my new angle incorporates a greater degree of scholarship, nuance, and practicality into my final policy recommendations. It accounts for a longer time frame that matches the pace of policy making in Washington and develops a broadly applicable model of China's responses to administration changes in Taiwan. In this way, my work's relevance stretches beyond 2020.

While writing the research section of my policy memo felt familiar in some ways, writing policy recommendations was a new experience. Creating new ideas, rather than nuancing or building off of others, was originally an overwhelming request; it is hard to choose between apparently unlimited ways of approaching the same problem. I had to tap into the world of practitioners (rather than academics) to come up with solutions. Luckily, my experience working in an East Asia office and on the Advanced Analytics desk in a "functional bureau" of the State Department gave me insight into how teams like DRL function within the broader policy making sphere. Through conversations with Taiwan experts across the State Department, I was able to identify a group in Taiwan that I could work with. On the US side, I gained a working understanding of the relationships between different Bureaus within the State Department. In connecting Bureaus that frequently collaborate with DRL to the project, harnessing their resources, and adding manpower, I hoped to make an ambitious task feasible.

Writing this Policy Memo pushed me outside the academic bubble, asking me to make arguments that took into account not only existing research and gaps in the scholarly conversation, but pressing political need, efficiency, resources, timelines, and even the power of interpersonal relationships. Tying academic research to practical application challenged my comfortable distance from my work to consider the implications of my project long after I submitted it. In presenting my paper to a team at the State Department and the National Security Council in January, I found myself bridging a gap between academia and practitioners for the first time in my Princeton career—and hoping that my paper made the same jump.

Editor Commentary

Leina Thurn

The excerpt of Maggie Baughman's paper above begins with a paragraph taken from the end of her introduction, when she creates a roadmap of her argument to come. The rest of the excerpt is taken from the very end of her paper, when she describes the interesting methodology behind her policy recommendations: Maggie borrows epidemiological theory to model the spread of misinformation in election cycles. Finally, her thesis—which takes the form of two policies—argues that the US State Department should utilize various pre-existing Taiwanese and American organizations in specific ways to fight the Chinese government's spreading of (mis)information in Taiwanese elections.

It is not hard to see that Maggie's paper fits into our issue's theme, "Top-notch Tactics." Her decision to merge epidemiology with technology and politics is highly tactical and well executed. While this seems strange at first, she quickly shows that a model for the spread of disease is a surprisingly effective lens for viewing the spread of information. Moreover, using this lens, she argues for a set of actions for the DRL to follow to limit the anti-democratic information warfare conducted by the Chinese government. Her thesis is literally a set of *tactics* to combat *tactics*.

But Maggie's thesis is tactical below the surface as well. Usually when we in the *Tortoise* encounter theses, we evaluate their *manageability*, among other things. A *manageable* thesis is one whose claim is appropriately supported by the evidence at hand and which is able to be argued within the given parameters of the paper (i.e. its length). Maggie's thesis checks these boxes. Its extensive use of evidence from Taiwanese election history and analysis of Chinese and US policies are more than sufficient to support its recommendations, and it does so successfully within its ~30 pages.

However, it is *manageable* on a more practical level as well. Maggie specifically tailors her recommendations to the departments and resources already available to the US State Department. Thus, she further argues for the adoption of her policies by including real life "evidence" that would make doing so not just possible, but even perhaps comparatively *easy* for the DRL. Additionally, one of Maggie's goals was that her thesis's applicability *not* be limited to the 2020 Taiwanese elections but that it be useful for future elections as well. By doing so, she extends the framework of her policy recommendations seemingly indefinitely. Not only does this

better fit the longer timeline of policy implementation within the DRL, but it allows for her policies to be continuously applicable for the foreseeable future.

Maggie manipulates the theoretical and practical evidence and framework of her argument in order to make her thesis *manageable* both pedagogically and pragmatically. Combined with a unique methodology, this makes Maggie's thesis very tactical indeed.

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Bios

Maggie Baughman '21 is a junior in the Woodrow Wilson School with certificates in Chinese Language and Culture, Applications of Computing, and Statistics and Machine Learning. At Princeton, Maggie works as a Head Fellow at the Writing Center, an RCA in Wilson College, and is a 2020 SINSI fellow through the Woodrow Wilson School. In her free time, Maggie rock climbs at the OA climbing wall, serves as the IM Chair for Tower Club, and goes for runs on the towpath. Maggie wrote this paper in a Woodrow Wilson School Policy Taskforce, "China and the Rule of Law." She wrote this paper as a junior.

Leina Thurn '20 is a native of Ashburn, Virginia, pursuing a concentration in Classics and certificates in Linguistics and Archaeology. She holds the role of Managing Editor of *Tortoise*, as well as positions as a Fellow in the Writing Center and a coin cataloger in Princeton's Numismatics Collection. She wrote this as a senior.