



#INDIGENOUS: A TECHNICAL AND DECOLONIAL ANALYSIS OF ACTIVIST USES OF HASHTAGS ACROSS SOCIAL MOVEMENTS

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Introduction

While it is clear that Indigenous peoples utilize social media and digital infrastructures to support social and political goals, work remains to be done to investigate the relationship and impacts of those sociotechnical assemblages in light of the political rights and quality-of-life of Indigenous peoples. This essay offers a snapshot of the content, circulation, and amount of data Native American activists circulated through Twitter during the 2016 US presidential election, revealing the contours of the technical challenges as well as the social and political boundaries shaping Native American political life. By comparing Native American content to a mainstream American dataset from the same period, our study further reveals that tweets propagated by Native American rights activists characteristically focus on life-and-death issues, which situates Native American and First Nations social media communication in an existential sphere. The work of Indigenous Internet researchers is therefore shifted beyond that of the researcher who ‘finds-out-how’ to the praxis of the activist researcher who discerns colonial effects, interrogates normative thought and practice, and designs alternatives that are commensurate with Indigenous worldviews through interpersonal experience, technical expertise, policy and governance, and metaphysical understanding.

The Praxis of Indigenous Digital Studies

At present, a fair amount of Indigenous Internet researchers are producing work that parallels popular Internet research approaches: technical design projects, user studies, network/system analyses, and conceptual/philosophical framings—but from an Indigenous research paradigm (Carlson 2017; Deschine Parkhurst 2017; Dreher et al. 2016; Latimore et al. 2017, LaPensee 2014; Vigil et al. 2015; Waitoa et al. 2015). Investigating uses of social media from an

Indigenous research paradigm means that researchers typically consider political, social, geographic, linguistic, historical, economic, and technological conditions as integral forces shaping Indigeneity as a political status (Duarte 2017). Indigenous peoples' orchestrations of digital assemblages are at once evidence for both the exigency and material expressions of Indigeneity.

For example, while a researcher may presume that an Indigenous people's well-populated Facebook group is evidence of progressing economic development through increased access to mobile devices, the Indigenous researcher will also note how individuals in that same group post regularly about enduring police brutality. The challenge is multi-fold: intellectual and epistemic, assumptions about structural violence, the liberatory potential of digital media, and what it means to be Indigenous.

Attempting to research Indigenous peoples' uses of social media outside of this paradigm erroneously renders Indigenous peoples as ethnic minorities of more perfect nation-states, or, narrowly, as users operating under anomalous or exceptional conditions. Both of these depictions are conceptually violent and reproduce epistemic injustice (Fricker 2007; Medina 2012). Understanding how large-scale sociotechnical infrastructures intersect and interoperate to allow for the productive transmission of data in colonial contexts substantiates theories of the social and political mechanisms of coloniality, and provides the grounds for understanding the realistic conditions of decoloniality.

Thus while there is evidence that groups of Indigenous peoples in different countries utilize social media and digital infrastructures to support their social and political goals, more work needs to be done to investigate the relationships afforded by and impacts of those sociotechnical assemblages in light of the political rights and quality-of-life of Indigenous peoples. As Dreher et al. (2016) note, despite the occasional embrace of the politics of Indigenous recognition by nation-states, there remains the failure to structurally sustain the "architectures of listening" that make recognition worthwhile. The Indigenous Internet researcher must learn to appreciate and characterize the depth of the ecology shaping Indigenous digital assemblages beyond visual representation (Gorzalak et al. 2015), akin to the ecologist who researches fungal communication systems at the roots of mother trees.

Indigenous activist researchers ask questions such as: How do Indigenous rights advocates utilize social media, and to what end? What technical affordances do certain kinds of social media offer to Indigenous peoples? How can systems that enable the political and social mobilization of autonomous Indigenous peoples be made? How do the politics of social media platforms interface with the daily experiences of Indigenous peoples? How

does the circulation of content through available channels relate to the effectiveness of Indigenous messaging? What distinguishes Indigenous peoples' uses of social media from non-Indigenous uses of social media? How does transmitting digital data about Indigeneity relate to being Indigenous? Layered tacitly beneath these lines of inquiry lies the researcher's hopes and strategies for ensuring that accessible digital media will allow Indigenous peoples to spread awareness and gain public support for the just nature of their causes. Furthermore, the goal is to identify and establish digital relational best practices that can guide global societal technological practices and ethics, as practitioners weave increasingly complex webs connecting the virtual and the real, the human and the artificial, the free and the secure, and on- and offline.

Tracing the Twitter Content of Native American Activists

In the winter of 2016, our team of Internet researchers was faced with three intertwined Indigenous intellectual challenges. The first was to address criticism of a grant proposal that was designed to discern the technical capacity of FM radio waves to transmit Internet data through sovereign Indian land (in the United States). Reviewers of the grant proposal characterized the augmentation of existing telecommunications infrastructures and resources as inadequately innovative; instead, they encouraged a research agenda that emphasized the deployment of brand new technology and infrastructure. Due to colonial economic development policies, however, many Indigenous communities cannot easily afford to invest in brand new large-scale infrastructure and technologies, hence the search for innovative modification of *existing* infrastructure. Moreover, research funders often discount this type of work due to the statistical insignificance of the Native American population size within the context of the broader US population.

The second intellectual challenge was to conceptualize the cumulative effects of Native American activist uses of social media after working in activist circles and qualitatively researching the digital tactics of one particular social movement. After focusing extensively on large-scale digital infrastructure studies, a third researcher attempted to conceptualize the relationship between connective action and the technical requirements of social media networks. Together the team designed a study that would provide evidence to address each line of inquiry. All three researchers were motivated to find evidence 1) of the relationship between political participation, social media, and bandwidth; 2) to support technical network innovation in Indian Country; and 3) to quantify Indigenous connective informational practices using pre-existing platforms and infrastructures.

Methodology: Situational Indigenous Internet Research

The team conducted a mixed-methods social network analysis of a small sample ($n = 33$) of Native American activist uses of Twitter from 11 February to 31 March 2016, paying specific attention to the political content circulating through the sample dataset, the network characteristics shaped by hashtags and affinity groups, and the bandwidth characteristics of the content propagated within the sample dataset. In spring 2016, the US presidential race was marked by increasingly extremist rhetoric from the Trump campaign, socialist solutions from the Sanders campaign, and a neoliberal democratic line from the Clinton campaign. Our team analyzed social media as a critical micro-media channel for disseminating news among Native American social groups, particularly in the absence of accessible structural means of political participation within state and federal governments. The researchers thus conceptualized Indigenous political messaging via Twitter as evidence of digital political participation by a structurally marginalized social group. The team asked three research questions:

- 1) *What political content do Native American advocates share on Twitter?*
- 2) *What are the network characteristics of sub-communities present within the Native American advocates dataset?*
- 3) *In light of bandwidth restrictions in Indian Country, what are the bandwidth characteristics of content propagated by and from Native American advocates?*

While the immediate objectives of the research were to collect quantitative and qualitative data to inform Internet infrastructural innovation in low-resource reservation environments, a parallel goal was to produce conceptual evidence of the materiality of Native American activism and political participation through digital means. Additionally, cognizant of the US National Science Foundation's (NSF) preference for projects rooted in evidence-based practice, and the need for evidence to support policy-making, the project was designed with the culture of the NSF and the broadband regulatory mechanisms of the US Federal Communications Commission in mind. The research team thus entered the project attuned to the concept of research as political, tactical, strategic, and oriented toward changing the mindsets of gatekeepers within a colonial environment.

Data Collection

For the first round of data collection, the team reviewed their own social media accounts to identify the top hashtags and user accounts they follow for updates

about Indigenous politics and rights work. They also consulted within their own personal networks, asking fifteen reputable Indigenous rights advocates to list the top Indigenous-rights-focused Twitter and Facebook accounts they follow. The resulting list was narrowed to 33 Twitter user accounts and 45 hashtags. From 11 February to 31 March 2016, the team queried the Twitter Streaming API with the list of 33 user accounts and 45 hashtags. The query yielded 5,172 unique tweets created by 2,086 content creators, and 5,930 retweets propagated by 5,019 users, resulting in a total of 11,102 tweets. For purposes of comparison, a random 1% sample of US tweets was collected through the same dates. Both samples were filtered to yield content relating to political matters based on terms relating to the US presidential race, rights, and advocacy.

Data Analysis

The team employed a four-stage process for analyzing the data. The first stage consisted of loosely categorizing topics emerging from random samples of the Native American advocates dataset. The second stage consisted of assessing media richness, which included measuring the size of content per tweet and trends in the photos, videos, and links associated with tweets. The third stage consisted of applying social network analytic methods, including hashtag-centric ego networks,¹ descriptive statistics, sequence analysis, and cluster analysis to discern the top trending hashtags and actors, relationships, and dynamics between ego networks and characteristics shaping the propagation of content through the sample set. The fourth stage of analysis consisted of interpreting the findings through the lenses of connective action and media richness,² as well as through a sociological understanding of factors and conditions shaping the Internet infrastructural and social media landscape in Indian Country (Bennett and Segerberg 2013; Daft 1984).

¹ Ego networks represent a neighbourhood, wherein the ego node is the focal vertex and neighbours are vertices that form edges with the ego node. For hashtag-centric ego networks, social media hashtags function as the ego nodes and Twitter users function as the neighbours. When examined in aggregate, our data can be represented as a bipartite graph (where hashtags form one set of nodes and users form the other set); however, for ease of temporal analysis, we rely upon the ego network representation.

² Connective action refers to the ability of actors who may not know each other face-to-face to communicate and articulate a coherent political vision and goals as well as a set of actions to achieve those goals through the affordances of social media networks rather than through purely social face-to-face means or through the affordances of brick-and-mortar institutions. Media richness refers to the meaningful qualities and amounts of information circulating through an array of media channels. In the field of information systems, media richness offers a means by which to assess the relative weight of meaningful packets of information, in this case bytes flowing through digital channels.

Findings: Life-and-Death Issues, Strategic Hashtags, and Need for Greater Bandwidth

Each stage of analysis produced results that addressed the research questions from both technical and social perspectives. Read in complementary fashion, the findings reveal how during an integral moment in US political agenda-setting, Native American advocates—such as journalists, bloggers, academics, activists, educators, and writers—were disseminating critical news about violations of human rights, civil rights, sovereign tribal rights, and the environment, alongside consciousness-raising messaging about the status of Native American and Indigenous peoples. This messaging was circulating through affiliated issue groups comprised of Twitter user accounts via tweet/retweet functions and the deliberate application of hashtags with conscientious use of photos and links to videos, indicating reliance on multiple interoperable platforms such as YouTube and web browsers. The size of the content, and rates of content propagation, indicated the minimum bandwidth and technical system affordances required for such activity to continue among that sample set of users.

From 11 February to 31 March 2016, Native American advocates tweeted political content relating to life-and-death issues in Indigenous contexts more often than updates about the 2016 US presidential election. The Native American advocates sample dataset consisted of 11,102 tweets, and included 2,885 distinct hashtags. The top ten most tweeted hashtags were, in descending order, #indigenous; #mmiw (an abbreviation for Missing and Murdered Indigenous Women); #tairp (an abbreviation for the American Indian Red Power movement); #nativelivesmatter (which is a movement that parallels the Black Lives Matter movement, and raises awareness of police brutality); #nativeamerican; #idlenomore; #ndn (which is a colloquial abbreviation of Indian); #hiring; #colonialism; and #cdnpoli (which refers to Canadian politics). Only one of these hashtags, #hiring, appeared to emerge from an automated content aggregator. Out of 11,102 tweets, #indigenous appeared in 2,303 original tweets and in 3,042 retweets, and was applied by 2,839 users. The second most propagated hashtag was #mmiw, which appeared in 607 original tweets and in 1,054 retweets, and was applied by 1,031 users. Out of the top ten hashtags, five capture the politically exigent status of Native American and Indigenous peoples: #mmiw, #nativelivesmatter, #idlenomore, #colonialism, and #cdnpoli. 55% of the tweets in the Native American advocates dataset referred to matters of Indigenous identity and 32% referred to matters pertaining to civil rights, while in the random 1% general population dataset only 22% of tweets referred to matters of identity, and mostly

referenced celebrities. None of the top 100 hashtags in the random 1% general Twitter dataset referred to civil rights issues.

Additionally, comparative statistical analysis of the top 100 most mentioned user accounts associated with political action revealed compelling differences between the Native American advocates dataset and the random 1% general population dataset. The top ten user accounts associated with political action within the Native American advocates dataset were, in descending order: @POTUS, @BernieSanders, @zhaabowekwe, @HillaryClinton, @goldmanprize, @indiancountry, @SenSanders, @BarackObama, @WinonaLaduke, and @realDonaldTrump. Comparatively, the top ten user accounts associated with political action within the random 1% general population dataset were, in descending order: @realDonaldTrump, @tedcruz, @HillaryClinton, @BernieSanders, @marcorubio, @FoxNews, @POTUS, @YouTube, @CNN, and @JonKasich. The comparison of the distinct datasets is not intended to create a dichotomous relationship between Native American advocates and a presumed mainstream US population, but rather, reveals the distinctiveness of the issues as these discursively emerge through sub-communities of Twitter users who advocate and raise awareness of matters affecting Indian Country. The fact that half of the top ten hashtags circulating through the Native American advocates dataset during the spring 2016 US presidential campaign relate to basic civil rights, police brutality, the sovereign rights of tribes, and missing and murdered Indigenous women reveals the divergence between the platforms of the US presidential candidates and the needs of Native American and Indigenous peoples.

From 11 February to 31 March 2016, distinct sub-communities of Native American advocates disseminated a range of content through common frequent use of #indigenous. Cluster analysis³ (Louvain method⁴ using the Jaccard similarity index⁵ as a distance metric) of hashtag-centric (egocentric) networks within the Native American dataset revealed trends in the propagation of certain sets of hashtags across distinct yet affiliated topical sub-communities. For example, one of the largest topical sub-communities consisted of approximately 591 actors within the sample timeframe, and was characterized by user affiliation through the hashtags #tairp, #freeleonardpeltier, and #indigenous.

³A methodological approach used by network scientists to group individual data points with similar data points, forming clusters within a dataset.

⁴A method used for community detection in a larger network structure.

⁵An index used to determine how similar two sets of objects are with respect to set membership. In our analysis, we compare sets of actors that are part of each hashtag-centric network.

Meanwhile, a distinct neighboring large topical sub-community consisted of approximately 183 actors within the sample timeframe, and was characterized by user affiliation through circulation of the hashtags #mmiw, #idlenomore, #cdnpoli, and #turtleisland. Yet another neighboring topical sub-community consisted of approximately 96 stable actors within the same timeframe and was characterized by circulation of the hashtags #nativelivesmatter and #blacklivesmatter. Comparison of these three distinct neighboring topical sub-communities shows how stable user accounts—or actors—tweet and retweet certain sets of hashtags through distinct issue groups, which manifest as topical sub-communities in a social graph of a Twitter dataset. The persistence of actor engagement around individual hashtags and sets of hashtags reifies the affiliation occurring between different issue groups using Twitter to disseminate information. In that sense, tweeting and retweeting certain hashtags and following and referencing associated sets of user accounts heightens the propensity of consolidating issue groups through Twitter.

A comparison of the three abovementioned topical sub-communities reveals slight differences in perspectives in North American Indigenous politics, with the largest group shaped by discourse and issues shaping the American Indian Movement (AIM), the second largest group shaped by an apparent First Nations focus,⁶ and the latter group, Native Lives Matter, influenced by the discourse of Black Lives Matter (BLM). From a social scientific perspective, what binds AIM, First Nations issues, and Native Lives Matter is the political status of Indigenous peoples: Indigeneity. In the sample dataset comprised of tweets produced by Native American advocates, this is shown through the persistence and prevalence of the hashtag #indigenous across all of the topical sub-communities, where the hashtag #indigenous appears more frequently than any other hashtag, both on its own and in combination with other hashtags.

For this research, persistence is characterized as the frequency of consecutive time segments—minutes, hours, and days—in which a hashtag appears after an original post. Hashtags that appear for minutes at a time after original posting are ephemeral. In this dataset, #wearebernie was the most persistent ephemeral hashtag. Hashtags that appear for hours at a time after original posting are event-driven. In this dataset, #mmiw was the most persistent event-driven hashtag; the research team hypothesized this may have

⁶ First Nations-focused tweets referred overtly to Canadian politics; First Nations tribes, reserves, or communities; and/or social movements or issues emerging from specific First Nations experiences as opposed to social movements or issues emerging from specific Native American (US) experiences.

been due to a planned grassroots MMIW event. Hashtags that appear for days at a time after original posting are pervasive, and #indigenous is the most persistent pervasive hashtag. Finally, prevalence measures the frequency of days hashtags persist relative to all other time segments. For the Native American advocates dataset, #indigenous, #nativeamerican, #tairp, #mmiw, and #jobs were the most prevalent. Out of these five, #jobs is the only one that appeared to emerge from an automated content aggregator.

Interpreting these measures of content circulation against the topical sub-communities, it is possible to ascertain the function of #indigenous—and to a slightly lesser but still important extent, #nativeamerican, #tairp, and #mmiw—as a technical boundary spanner linking distinct issue groups. From a social scientific perspective, this finding indicates the discursive strength of the concept of Indigeneity insofar as it works through a sample of the Twitter digital sphere in this particular historical moment.

From 11 February to 31 March 2016, Native American advocates were more likely to tweet and retweet content with photos, indicating a demand for high-speed bandwidth in the context of Native American political uses of Twitter. A major motivation of this research was to obtain a realistic sample of uses of a commonly available social media platform—Twitter, in this case—that could be used to deduce characteristics of the size in bytes and content in file types that Native American advocates might rely on for distributing critical news and updates relevant to Indian Country.

Our approach to understanding bandwidth demand entailed mining our collected tweets for the presence of embedded and hyperlinked media. Of the 5,172 unique tweets we observed in the Native American advocates dataset, 1.7% contained embedded video content, 35.8% contained embedded photo content, and 62.5% did not contain any embedded content. Per Daft and Lengel's (1984) definition, we consider tweets with embedded media to be richer⁷ than those that lack embedded media. Moreover, we consider tweets with embedded videos or GIFs to be richer than tweets with embedded photos based on the fact that such media offers the “simultaneous transmission of multiple information cues” (Lengel and Daft 1984). Similarly, we consider tweets with embedded videos to be richer than tweets with embedded GIFs, as the audio component lends the expression of a greater “variety of languages” (Lengel and Daft 1984).

Critically, we examined the relationship between embedded media and content propagation. We based our comparisons on our collected tweets that

⁷ Containing more information via larger media files.

contained embedded content, and those that did not contain embedded content, using two-sample Kolmogorov-Smirnov tests.⁸ Overall, we observed that 66% of tweets with embedded media received at least one retweet while only 41% of tweets without embedded media were retweeted at least once. Additionally, we found that tweets with embedded media (photo or video) received higher levels of user engagement ($p < 2 \times 10^{-16}$); on average, tweets with embedded media reached 2.6 users and tweets without embedded media only reached 1.8 users. Similar to our analysis of hashtags present in the dataset, we also examined the prevalence of tweets with embedded media, where prevalence is the percentage of days between 11 February and 31 March 2016 in which the tweet appeared. When examining the prevalence of tweets containing embedded media, we found no significant difference between tweets with and without embedded media. However, we noted that 7 of the top 10 most prevalent tweets contained embedded media. As with the hashtags, we measured churn of specific tweets using the persistence metric at the scale of minutes, hours, days, and weeks. Most tweets did not exhibit persistence at any scale. We found that only 1.8% of all tweets were persistent on the scale of days (i.e., “recurrent”), and of these 66% contained embedded media (of which all but one were photos). Moreover, when analyzing the 0.4% of tweets that are persistent on a week-long scale, we found that 85% contained embedded media.

A pernicious lack of communications infrastructure in Indian Country prevents Native Americans in these communities from fully engaging with political discourse that increasingly takes place on media-rich platforms (Baldy 2016; Waitoa et al. 2015). Our results demonstrate that the content richest in media is the content that reaches the largest audiences and is the most enduring in Native American advocates’ political conversations on Twitter. In particular, our investigation into circulation with respect to tweets’ persistence and prevalence further highlights the value of embedded photos. Overall, our findings with respect to embedded media agree with Daft and Lengel’s (1984) assertion that some media are superior to others for communicating information (as measured by propagation and circulation metrics), but it also demonstrates that there are limits to the benefits of increasing media richness—namely, the cost of resources required to support richer media might make “less rich” media a more appropriate communication tool. For instance, only 1.1% of the most persistent tweets in the Native American advocates dataset contain video, whereas 65% of the most persistent tweets contain a photo. While Native American advocates may not consciously craft and propagate content with

⁸ The two-sample Kolmogorov-Smirnov test compares the statistical similarity between the distributions of two samples.

bandwidth requirements in mind, the fact that limitations of the underlying IP network may impact information diffusion across the relatively bandwidth-light Twitter platform is worth consideration, particularly if the desired audience for content is connecting from areas with limited ICT infrastructure (Tufekci 2014).

While the team was unable to discern precise geographic locations of types of content creation—such as, for example, mobile uploads in Chicago—this snapshot of the richness of the media types that Native American advocates circulate through Twitter can nevertheless be understood within the technical landscape of US reservations, and remote, rural, and urban communities in which Indigenous peoples reside. The implications of these findings suggest that without accessible bandwidth, social media platforms, devices, and social media savvy, Native American advocates may not have the capacity to distribute content about Native American and Indigenous issues in the midst of mass media focus on mainstream American agenda-setting and political campaigns.

Discussion: Demystifying Digital Affordances for Indigenous Goals

One of the most challenging aspects of activist research has to do with summarizing conceptually rich findings through a single evocative story that compels people—and especially policy-makers—to make the structural changes that will alleviate systemic social inequity. For Indigenous Internet researchers, weaving praxis into our research occurs in at least four ways. This particular study inspires renewed understanding of the field and practice of Indigenous Internet studies at the levels of experience, technique, policy and government, and at the level of ontology, or metaphysics.

1. At the level of experience

It is important to note that a major motivation for this research was the experience of researchers enduring marginalization not only in the academy but also as people advocating for Native American rights in everyday life. Combining doctoral-level research experience with a keen understanding of the technical aspects of social media specifications and uses, and grassroots organizing by and for Native and Indigenous peoples, introduces a level of nuance into both the accompanying research and activism. Erica Violet Lee (Nēhiyaw/Cree) writes about surviving “wastelands”—harsh environments wherein Indigenous peoples and lands become marginalized within the constraints of industrial infrastructure:

We deserve things written for us, and written by us. We deserve to know our medicines and our laws, but this place is not any utopia, so we grow our medicines from the cracks in concrete sidewalks or in between railroad tracks. We have to dig our laws out from underneath gravel logging roads and tend to our worlds in contaminated fields. (Lee 2016, n.p.)

Finding the data to conduct this research study required just such digging. Each member of the research team moved beyond the assumption that ‘everything can be found on the Internet’ and reached out to their personal networks. Those networks consisted of Native and Indigenous individuals who likewise have spent years cultivating personal relationships with other Native and Indigenous advocates, and who relate through a positive change-oriented mentality in spite of living in a ‘contaminated’ colonized life-world. Indeed a fourth research team member who later joined the team to assist with statistical and network analysis noted early on how without the ability to tap into personal networks it would be challenging to identify hashtags and user accounts that would yield the essential data.

Similarly, the construction of the political context and the literature framing the research questions very much required an inherently Indigenous interpretation of known relevant studies and historical explanations. In this sense, designing and conducting Indigenous Internet research is still very much tied to the experience of *being Indigenous while being digitally connected*. The investigation and interpretation of Native and Indigenous digital spheres and experiences becomes not about setting up false binaries between nature and machine, or spirituality and technology, but rather becomes about understanding how Native and Indigenous peoples move their political and social efforts through media that rely on digital infrastructure. The medicine in the work—and by medicine we refer to the physical, social, emotional, intellectual, and metaphysical means by which Indigenous peoples heal themselves, lands and waters, and others—is in the broader praxis-based impacts of the research findings.

2. *At the level of technique*

A decolonizing and/or Indigenous approach to Internet studies requires a technical understanding of what the Internet is made of, how digital systems work, and the discourses and methods characterizing the fields and sub-fields that shape computing and digital media. By its nature, Indigenous work requires that activist researchers contribute to Indigenous ways of life. This occurs

through conscientious methodological design, preparation and dissemination of findings, advocacy work, and other forms of creative expression.

On many different occasions the research team reflected on their own Internet-based practices, and renewed commitments to lines of inquiry, personal practices, and ethical commitments. After the conclusion of this study, one researcher began encouraging activists in her personal network to tag #indigenous and to attach photos as a way to spread messaging further within their various social media campaigns. In addition to her usual level of activism, another researcher began contributing more to her fashion blog, challenging stereotypes, and showing positive images of Native women. Two of the researchers have started planning projects to articulate these findings with regard to cybersecurity, information assurance, trust and privacy, and the technical requirements and digital literacy needed for citizen journalists, bloggers, students, educators, scholars, and writers to continue using social media platforms to disseminate critical updates in Indian Country. Due to the technical constraints shaping Indian Country, to advocate for Native and Indigenous rights through social media is to advocate for digital media communication, which leads to advocating for and learning techniques for the construction of stable and secure infrastructure.

3. For policy and governmental consideration

After the research team completed the final analysis, a number of events profoundly shaped Internet and telecommunications policy and research as well as activism in Indian Country. These included: 1) the November 2016 election of Donald Trump as the 45th President of the United States; 2) Russian hacking of multiple US data-sharing infrastructures—including social media platforms—for the purpose of destabilizing US electoral processes; and 3) the September–December 2016 militarized corporate and government attacks on Native American activists, journalists, and elders protesting the illegally constructed Dakota Access Pipeline.

Freedom of Information Act requests revealed that the Department of Homeland Security, the FBI, TigerSwan, and other associated government and security firms were actively surveilling NoDAPL activists and their allies via social media, and possibly through the use of cell tower-mimicking devices around the sovereign lands of the Standing Rock Sioux Tribe (Brown et al. 2017). Government surveillance of marginalized populations has long-term structural and social effects. On September 1, 2017, a Whatcom County Superior Court judge granted the Whatcom County Prosecutor and the Department of Justice a warrant to search a Bellingham NoDAPL Facebook group, which, due to the expected undefined amalgamation of an unknown

amount of personal data gleaned from the individual accounts associated with a Facebook group, is expected to affect the privacy rights and civil rights of the approximately 1,700 members of the group (Last Real Indians 2017; Relyea 2017). The outcome of the case may establish precedent for the courts to grant law enforcement searches of loosely affiliated groups of social media users allegedly engaged in acts of civil disobedience, and depending on the amalgamation and presentation of the data, may also grant law enforcement and attorneys with the capacity to collect ephemeral and potentially unreliable and unverifiable social media data in the construction of a case against potential defendants. As these examples, and indeed our own research demonstrates, with just a bit of technical data it is possible to identify associations between user accounts. But how will this data be used or abused? This study occurs in a historical moment when governments themselves use social media to advance policies, spread fear, and to characterize and define terror groups; when corporate social media giants apply consumer-friendly formulas to control—and in some cases block—the flow of user-generated information; and when massive data breaches challenge all levels of government, including tribal governments (Dreyfus 2016; Roberts 2016; Schwirtz and Goldstein 2017).

The social, political, and technological stakes for Indigenous Internet research are grounded within particular politico-historical moments. The quality and epistemic truth-value of the work lies in the capacity of researchers to discern the struggles, infrastructures, practices, and conditions of justice—social, relational, political, and juridical—shaping Indigeneity. Situating the work in a contemporary milieu, while *being Indigenous and being digitally connected*, imbues the work with a quality of credibility in speaking truth to power. In this case, the research team recognized both the relative vulnerability of Native American rights advocates of all backgrounds as well as the need to strengthen more robust technical Internet infrastructure and secure data environments for marginalized peoples. Because Internet infrastructures, social media platforms, and digital devices are complex, the solutions must be both through technical, as well as policy work and education.

4. For metaphysical consideration

Meanwhile, in Native and Indigenous studies, the combination of concepts of relationality and a poststructuralist approach to human and nonhuman relationships are allowing researchers to rethink ontological orderings of various Indigenous life-worlds. (Tallbear 2017; Watts 2013) At an ontological level, the utterance—in this case the tweet—is meaningful due to the actionable capacity—the potentiality—it co-creates among all beings that experience its existence, from machine-readable systems to civil rights attorneys.

From the perspective of social theory, it is surprising to see the work that a hashtag—#indigenous—is doing in binding together political issue groups through Twitter. But as Indigenous thinkers who, as Lee (2016) characterizes, “grow our medicines from the cracks,” the understanding that a hashtag affords responsive actionable communication between diverse land and water defenders points to a mutual experience—a shared language of the senses—cohering and emerging among diverse geographically widespread actively-decolonizing peoples. From a social scientific perspective, more studies are needed to trace the rhetoric and connective action of loosely affiliated converging and diverging Indigenous issue groups emerging by means of social media platforms. Yet with regard to praxis, what this means is that to construct decolonizing technologies, an Indigenous person must also deeply understand the relationality around them—the energetic and actionable qualities among animate and inanimate beings—and how that ecology co-constitutes humanity and belonging. Decolonizing technologies must likewise be co-created, and bring forth a particular pace and rhythm of life—in particular, one that restores dignity in spite of the absence of “architectures of listening” (Dreher et al. 2016). Of course, not all decolonizing technologies are necessarily digital. Many are pressed into clay, planted in the earth, or are enacted in private ceremonies. But they are all structures that Indigenous peoples can safely live by and through. What decolonizing technologies have in common is that they afford dimensions of human utterances, and those utterances define the justice of relationality in spite of the persistence of colonialism.

Conclusion

Though Indigenous Internet research is enacted through technological praxis, it is also grounded by distinct ontological orderings of Indigenous life-worlds, rooted as they are in the sacred homelands and waterways. Creating digital technologies *in situ* requires a keen understanding of the social, historical, and technical constraints shaping Indigenous demand for useful and effective digital systems. While the results of a 2016 assessment of Native American activist uses of Twitter provide data that can be used to improve user experience and enhance technical networks, a decolonial interpretation of the results, and of the study as a whole, reveals the levels of intellectual labour through which Indigenous digital praxis occurs. As a mode of resistance, Indigenous Internet research and praxis is in phases scientific, experiential, technical, governmental, political, and metaphysical. Above all, it is oriented toward an interrogation of

brutality, and aims to shape a healthier quality-of-life for Native American and global Indigenous peoples.

Works Cited

- Baldy, C. 2016. "The New Native Intellectualism: #ElizabethCook-Lynn, Social Media Movements and the Millennial Native American Studies Scholar." *Wicazo Sa Review* 31 (1): 90–110.
- Bennett, L. and Segerberg, W. 2013. *The Logic of Connective Action: Digital Media and the Personalization of Contentious Politics*. Cambridge: Cambridge University Press.
- Brown, A., Parrish, W., and Sperri, A. 2017. "Leaked Documents Reveal Counter-Terrorism Tactics Used at Standing Rock to 'Defeat Pipeline Insurgencies.'" *The Intercept*, 27 May. <https://theintercept.com/2017/05/27/leaked-documents-reveal-security-firms-counterterrorism-tactics-at-standing-rock-to-defeat-pipeline-insurgencies/>. Accessed 20 September 2017.
- Carlson, B., et al. 2017. "Trauma, Shared Recognition, and Indigenous Resistance on Social Media." *Australasian Journal of Information Systems* 21: 1–18. <http://journal.acs.org.au/index.php/ajis/article/view/1570/775>. Accessed 26 December 2017.
- Daft, R., and Lengel, R. 1984. "Information Richness: A New Approach to Manager Information Processing and Organisational Design." In *Research in Organizational Behavior* 6, ed. Cummings, L. & Staw, B. (pp. 191–233). Homewood, IL: JAI Press.
- Deschine Parkhurst, N. 2017. "Protecting Oak Flat: Narratives of Survivance as Observed through Digital Activism." *Australasian Journal of Information Systems* 21: 1–18. <http://journal.acs.org.au/index.php/ajis/article/view/1567/774>. Accessed 26 December 2017.
- Dreher, T., McCallum, K., and Waller, L. 2016. "Indigenous Voices and Mediatized Policy-making in the Digital Age." *Information, Communication, and Society* 19 (1): 23–39.
- Dreyfuss, E. 2016. "As Standing Rock Protestors Face Down Armored Trucks, the World Watches on Facebook." *Wired*, 27 October. <https://www.wired.com/2016/10/standing-rock-protesters-face-police-world-watches-facebook/> Accessed 16 December 2017.
- Duarte, M. 2017. "Connected Activism: Indigenous Uses of Social Media for Shaping Political Change." *Australasian Journal of Information Systems*

- 21: 1–12. <http://journal.acs.org.au/index.php/ajis/article/view/1525/769>. Accessed 26 December 2017.
- Fricker, M. 2007. *Epistemic Injustice: Ethics and the Power of Knowing*. Oxford: Oxford University Press.
- Gorzelak, M., Pickles, B., Asay, A., and Simard, S. 2015. “Inter-plant Communication Through Mycorrhizal Networks Mediates Complex Adaptive Behavior in Plant Communities.” *Annals of Botany Plants* 7: plv050.
- Latimore, J. et al. 2017. “Reassembling the Indigenous Public Sphere.” *Australasian Journal of Information Systems* 21: 1–15. <http://journal.acs.org.au/index.php/ajis/article/view/1529/773>. Accessed 26 December 2017.
- LaPensee, E. 2014. *Survivance: An Indigenous Social Impact Game*. PhD thesis. Simon Fraser University, Vancouver, Canada.
- Last Real Indians. 2017. “Warrant Granted Against NoDAPL Facebook Page is Anti-Indigenous.” *Last Real Indians*, 30 August. <http://lastrealindians.com/warrant-granted-against-nodapl-water-protector-facebook-page-is-anti-indigenous/>. Accessed 20 September 2017.
- Lee, E. 2016. “In Defence of the Wastelands: A Survival Guide,” *Guts Magazine* 7, <http://gutsmagazine.ca/wastelands/>.
- Lengel, R., and Daft, R. 1984. *An Exploratory Analysis of the Relationship Between Media Richness and Managerial Information Processing*. Organizations as Information Processing Systems. Technical Report, US Office of Naval Research. Department of Management, Texas A&M University, 1984.
- Medina, J. 2012. *The Epistemology of Resistance: Gender and Racial Oppression, Epistemic Injustice, and Resistant Imaginations*. Oxford: Oxford University Press.
- Relyea, K. 2017. “Judge Upholds Warrant to Search Bellingham #NoDAPL Facebook Page.” *The Bellingham Herald*, 31 August. <http://www.bellinghamherald.com/news/local/article170359632.html>. Accessed 20 September 2017.
- Roberts, S. 2016. “Commercial Content Moderation: Digital Laborer’s Dirty Work.” In *The Intersectional Internet: Race, Sex, Class, and Culture*

- Online*, ed. Noble, S.J. and Tynes, B. (pp. 146–160). New York: Peter Lang.
- Schwartz, M., and Goldstein, J. 2017. “Russian Espionage Piggybacks on a Cybercriminal’s Hacking.” *New York Times*, 12 March. <https://www.nytimes.com/2017/03/12/world/europe/russia-hacker-evgeniy-bogachev.html>. Accessed 20 September 2017.
- Tallbear, K. 2017. “Beyond the Life/Not Life Binary: A Feminist-Indigenous Reading of Cryopreservation, Interspecies Thinking and the New Materialisms.” In *Cryopolitics: Frozen Life in a Melting World*, eds. Joanna Radin and Emma Kowal. Cambridge, MA: MIT Press.
- Tufekci, Z. 2014. “Big Questions for Social Media Big Data: Representativeness, Validity and Other Methodological Pitfalls.” In *ICWSM '14: Proceedings of the 8th International AAAI Conference on Weblogs and Social Media*, May 2014, Ann Arbor, MI. <https://www.aaai.org/ocs/index.php/ICWSM/ICWSM14/paper/viewFile/8062/8151>.
- Vigil, M., Rantanen, M., and Belding, E. 2015. “A First Look at Tribal Web Traffic.” *Proceedings of the 24th International Conference on the World Wide Web 2015*, 18–22 May 2015, Florence, Italy. <http://dx.doi.org/10.1145/2736277.2741645>.
- Waitoa, J., Scheyvens, R., and Warren, T. 2015. “E-Whanaungatanga: The Role of Social Media in Maori Political Empowerment.” *AlterNative: An International Journal of Indigenous Peoples* 11 (1): 45–58.
- Watts, V. 2013. “Indigenous Place-Thought and Agency Amongst Humans and Non Humans (First Woman and Sky Woman Go On a European World Tour!),” *Decolonization: Indigeneity, Education and Society* 2 (1): 20–33.