Investigative Methods

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INVESTIGATIVE METHODS

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Investigative Methods: An Editorial Introduction

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In our role as editors, in this introduction we draw on and extend the work of the historian Carlo Ginzburg (esp. 1980, 1989, 2013) to set out what we see as some of the main characteristics of investigative methods as a distinctive if heterogeneous field of research practices in their own right and explore their relevance in, to and for the social sciences. With reference to the ten contributions that make up the collection, we identify five such characteristics. As we perceive them, investigative methods have:

1. *particularity, specificity or concreteness of focus;*
2. *the objects of investigation which provide that focus are typically unavailable to direct observation meaning investigations must take at least part of their lead from 'trace' data as a critical source of evidence that can be repurposed to access and reconstruct them indirectly;*
3. *that trace data acquires significance not on its own but by being linked to other data in bespoke evidentiary chains, catenaries or assemblages worked up as part of the investigation in question;*
4. *where the investigative targets are particularly complex, the process of data gathering, assessment and analysis is typically distributed and collaborative, something which demands its own methods; and*
5. *the ultimate aim is not just to know or understand the objects of investigation better, important as that is, but to intervene, whether by challenging an existing account or by opening up space for action on the issues the investigation has identified (something which itself can take many forms in relation to the contemporary politics of evidence).*

Based on this ideal-typical rendering of these practices, we argue the kinds of investigative methods detailed in our ten contributions can offer powerful contributions to contemporary research repertoires in the social sciences by offering a distinctive approach to knowledge making, increasingly through creative work with digital data and technologies that puts them to previously unanticipated ends.

Introduction

Investigative methods are at work all around us and in powerful ways. As a consequence, we do not need to look far to find examples of those methods in action. In 2018, for instance, the Russian political exile Sergei Skripal and his daughter Julia were the target of a botched assassination attempt in Salisbury, UK, involving a deadly Novichok nerve agent administered to the door of their home there. While the Skripals survived the assassination attempt, several other local people were also poisoned after coming into contact either with the Skripals or remnants of the discarded nerve agent. This included Dawn Sturgess who tragically subsequently died, leading to the launch of [a murder inquiry into the incident](). Security services around the world instigated searches for the perpetrators, but it was investigators at the agency Bellingcat, Radio Svoda and their Russian colleagues at *The Insider*, who were able to connect the suspects to Russian Military Intelligence using various unconnected photographs and videos posted on the internet. Leading a network of investigative journalists, Bellingcat has subsequently been able to link the chief suspects in the assassination to a range of other illegal activities across Europe, including the bombing of arms depots in Czechia and Bulgaria, again by [using public domain data sources to connect up the investigative dots](). Nor is this an isolated case. Alongside the Bellingcat investigation, 2021 has also seen a string of equally high-profile investigative revelations from the exposure of [the Pegasus spyware and its criminal uses](), the documenting of [possible war crimes]() in Ethiopia as part of the ongoing conflict in its Tigray region, through to the release of the fourth financial 'mega-leak' in seven years, [the Pandora Papers](), following the earlier release of the Offshore Leaks, Panama

Papers and Paradise Papers. In the case of each of these latter disclosures, networks of investigative journalists working collaboratively across the globe have used the leaked financial data to document how wealthy individuals and members of political elites systematically engage in tax avoidance and, in some cases, tax evasion as well as other illegal activities, including asset stripping and the expropriation of public goods. Billed as the "largest investigation in journalism history" due to the scale of the leak, 11.9 million documents constituting 2.9 terabytes of data, the journalists involved in analysing the Pandora Papers, under the umbrella of the International Consortium of Investigative Journalists (ICIJ), have sought to show how, in their own words, this leak "exposes a shadow financial system that benefits the world's most rich and powerful".

Investigative methods, however, feature in our lives in relation to more prosaic matters too. Whenever someone sets out to use public and commercial datasets to reconstruct a family tree (cf. Godfrey this volume), for instance, or establish the provenance and hence value of some item they or their family happens to have, they employ their own kinds of investigative methods to do so. In the UK, more refined versions of these are the subject of two long running and popular primetime television shows: the BBC's *Who Do You Think You Are*, which works with celebrities to reconstruct their family genealogies, and *Fake or Fortune*, which connects the owners of art they suspect to be masterworks with experts who help them determine whether that is the case or not. Finally, in terms of this all too brief and selective overview, when confronted with a rare illness or condition, doctors turn investigators (Ginzburg 1980, Rapezi, Ferrari and Branzi 2005), a form of investigative expertise shared by psychologists, psychotherapists, epidemiologists and also with vets, farmers, gardeners and foresters. Indeed, investigative methods in the field of health and medicine have become matters of global public concern since 2019 when we learned painful lessons about the need to establish effective track and trace procedures within and across national boundaries to follow both the spread of the COVID-19 pandemic and the evolution of new variants of the novel SARS-CoV-2 virus which cause it.

The contributions that make up this collection are situated within that broad and open-ended field of investigative practices and together we believe they work to highlight their relevance in, to and for the social sciences. Each of the papers in the collection presents a different investigative method or set of methods and, through case studies, attempts to demonstrate their value. All the contributions, in different ways and for different purposes, seek to reconstruct acts, events, practices, biographies and/or milieux which the researchers in question lack direct access to but which they nonetheless want to get at via the traces those phenomena leave behind, traces themselves often produced as part of the phenomena under investigation. In reconstructing those phenomena, they also seek to contextualise them differently – or challenge their original contextualisations – and in the process say something about those wider contexts from the critical vantage point their investigations have concretely provided.

This particular *Innovation Collection* was initiated after NCRM held a two-day *Innovation Forum* in 2019 called Social Science in the Open. That event brought investigators working in different domains, sectors and on different topics of interest into dialogue with one another around lines of methodological convergence and divergence in their work. This *Innovation Collection* emerges from that event, bringing together a contribution from the investigative journalists at Bellingcat on airstrikes in the conflict in Yemen (Waters), investigations of forest fires in the Amazon and tear gas abuse globally from Amnesty International's Digital Verification Corps at Cambridge University (Lyndon and Nyarko, Lyndon, Tse, Moore and May-Hobbs) and an overview of financial investigations of corporate holdings that has its grounds in a long-standing collaboration with CorporateWatch (Whyte), alongside work involving historians (Bocking-Welch, Godfrey, Huzzey, Miller), sociologists and criminologists (Holder, Elsey, Kolanoski and Mair, Watson et al.), an anthropologist working with a filmmaker turned epidemiologist (Kierans, Glaser), a political

studies scholar (Leston-Bandeira) and a data scientist (Brace) all focused on different phenomena and leveraging disparate forms of evidence in order to trace those phenomena in their contexts. Publishing these contributions as a collection allows us to preserve that breadth and diversity while offering an opportunity to examine the various methodological themes that link the contributions.

While the contributions centre on particular investigative methods, our task here as editors is a different one. Having had the privilege of working with the authors on their contributions, in the space we have, we want to draw out what we see as the links between them and provide grounds for treating investigative methods as a distinctive open-ended domain of research practices in their own right. This is a domain of research practices in which investigators make use, for example, of specific quantitative, qualitative, accounting, text analytic, case study, digital and computational techniques but which is not reducible to any of them. That domain of methods has been an enduring feature within the landscape of the social sciences though often without being particularly remarked as such. It was the historian Carlo Ginzburg (1980, 1989), whose analysis we take up in more detail in the section immediately below, who first began to explore the importance of investigative methods in several fields, arguing, among other things, that history as a discipline is defined by their use. For examples of investigative research in other fields, we would point, for instance, to the work of Diane Vaughan (1996) on the Challenger Shuttle Disaster, an historical study that led NASA to involve her in the inquiry into the causes of the 2003 Columbia Shuttle Disaster, an unusual role for a sociologist (Vaughan 2006). As this collection was being finalised, Matthew Fuller and Eyal Weizman, two of the figures at the head of the award-winning Forensic Architecture, a research centre based in Goldsmiths University which employs natural and social scientific expertise alongside architecture and art to reconstruct human rights violations, state violence and war crimes based on investigative studies, have also set out their approach to what they call "investigative aesthetics" (Fuller and Weizman 2021). Nonetheless, while we would recommend that interested readers consult Fuller and Weizman's work in particular, we take our cue from the work of Ginzburg – our focus next.

Investigative Methods and the Evidential Paradigm

In one of his most celebrated works, 'Freud, Morelli and Sherlock Holmes: Clues and Scientific Method' first translated into English in 1980, Ginzburg relays the following ancient tale:

"Three brothers … meet a man who has lost a camel … At once they describe it to him: it's white, and blind in one eye; under the saddle it carries two skins, one full of oil, the other of wine. They must have seen it? No, they haven't seen it. So they're accused of theft and brought to be judged. There follows the triumph of the brothers: they immediately show how from the barest traces they were able to reconstruct the appearance of an animal they'd never set eyes on." (1980: 13)

He draws the following lesson from this tale:

"The three brothers … are clearly carriers of … [a] kind of knowledge, … Its characteristic feature was that it permitted the leap from apparently insignificant facts, which could be observed, to a complex reality which – directly at least – could not. And these facts would be ordered by the observer in such a way as to provide a narrative sequence" (ibid)

This form of knowledge, Ginzburg tells us, is exhibited in the ability to "construct the appearance and movements of … [the] unseen" by continually working "to sniff [out], to observe, to give meaning and context to the slightest trace" (1980: 12). It is, in a later translation, "oriented towards the analysis of specific cases … reconstructed … through traces, symptoms, and clues … [and communicated through] not … collections of laws or ordinances but discussions of concrete

examples" (1989: 105). This form of knowledge, which he variously labels the evidential or conjectural paradigm, is on display in the investigative methods employed by hunters, diviners, detectives (fictional and real), clinicians, psychotherapists and – critically for Ginzburg as it is his field – historians, among others, representing an alternate, frequently "subterranean" epistemic tradition, running in contrary directions to the expanding frontiers of the generalising sciences in Europe from the 15th century onwards.

In those disciplines where the evidential paradigm has a particular centrality, Ginzburg notes, practitioners learn to identify telling details, often anomalies, as part of developing investigative trajectories which proceed through the accumulation and interweaving of such details to tell a story and reach conclusions. Details are thus key, and to lose them by abstracting away is to lose, to adapt Harold Garfinkel (2002: 96), the investigative phenomenon itself. The particular cannot therefore be sacrificed in the service of more general concerns without undermining the investigation as a whole, it must instead always be recoverable from it. Equally, however, the particular should not be taken for granted and those trained in such methods learn not just to look but look differently, critically, reflectively and bear in mind the limits of what it is possible to judiciously glean from what they have before them, testing the strength of the links in their chains of evidence as they go. Consequently, even though those who make use of investigative methods may find themselves unable to draw on the intellectual apparatus of generalisation to warrant their practices due to their commitment to the specific, the concrete and the particular, their work is not *un*principled but, rather, *differently* principled. Contemporary counterparts of the investigative methods Ginzburg discusses and the different ways of knowing they embody are the focus of the contributions which form this collection and, with reference to them, our aim in the rest of this editorial introduction is to say more about what those principles might be.

Characteristics of Investigative Methods

Ginzburg's speculative epistemic history is often more philosophical anthropology than evidenced account. What is more, as contemporary increases in digital record creation and storage and the concomitant possibilities for accessing and sharing digital data have opened up new horizons across research fields, investigative methods, like other methods, are changing as these possibilities are explored (Fuller and Weizman 2021). The field today thus looks different to that Ginzburg surveyed in a number of ways. Nonetheless, Ginzburg's account remains instructive in key respects and we want to extend and elaborate on it here. We do so by outlining what we regard as five shared characteristics of investigative methods, derived from Ginzburg's discussion and informed by reflection on the work presented in this collection, characteristics which connect investigative studies that are otherwise highly distinct in terms of topics, data, analytical frameworks and research aims. We will outline each in turn.

First, investigative methods have *a particularity, specificity* or *concreteness of focus*. This is sharply in view in our contributions. Bocking-Welch, Huzzey, Leston-Bandeira and Miller, for instance, investigate specific practices of petitioning, and indeed, specific petitions, in different historico-political contexts. Brace's investigation takes as its starting point the livestreaming of far-right violence via the internet message boards those livestreamed attacks were directed towards and claimed inspiration from. Glaser and Kierans' contribution starts with the emergence of a mysterious form of chronic kidney disease which affects the otherwise young and healthy at epidemic levels in many areas of Latin America and whose aetiology is unknown. Godfrey begins with the details recorded on individual lives at their points of contact with the criminal justice system in the UK between the late 18th and early 20th centuries as made available in the form of digitised data. Holder, Elsey, Kolanoski and Mair examine the small corpus of videos of military operations that have come into the public domain in the last twenty years and what they say about

military practice, particularly regarding attacks on civilians. Lyndon in her collaborations with Nyarko and with Tse, Moore and May-Hobbs sets out to investigate specific examples of the abuse of tear gas by a number of nation states and the online disinformation campaign that accompanied the forest fires in the Amazon in 2019, respectively. Waters' work with Bellingcat deals with the conflict in Yemen, focusing on air strikes against non-military targets and the provenance of the munitions used. Watson, Meehan, Lynch, Nave and Dennis work with how videos of police shootings are handled by courts and Whyte examines the accounting practices of corporations in relation to the Prestige oil spill off the Galician coast in 2002 and tax fraud in relation to the collapse of the UK department store BHS. Even where these concerns are couched initially in more general terms, as with Bocking-Welch, Huzzey, Leston-Bandeira and Miller, Godfrey, Watson, Meehan, Lynch, Nave and Dennis and Whyte, it is clear that the types of methods discussed have to be capable of preserving the details of individual cases while pursuing the analysis of collections of such cases just as Ginzburg stressed.

How researchers come to settle on these specific investigative targets in any given case is often a process with a particular trajectory of its own. In the case of Glaser and Kierans, for instance, Chronic Kidney Disease of unknown or non-traditional origin (CKDu/nt) as it has been labelled was something they encountered in the course of work initially oriented to other issues, 'traditional' CKD in Kierans' case and a filmmaking project on labour exploitation in sugar cane plantations in Glaser's case, and which forced itself on their attention as an unexplained public health crisis displacing their original research concerns. For Holder, Elsey, Kolanoski and Mair and Watson, Meehan, Lynch, Nave and Dennis the process was more quotidian; like others around the world they too had followed the release of shocking videos of military and police violence and the heated debates they had sparked, deciding to investigate these controversial artefacts in their social, cultural, political and organisational contexts and the sense being made of them there. Lyndon and Nyarko, and Lyndon, Tse, Moore and May-Hobbs along with Brace, Waters and Whyte have even clearer investigative rationales. That is, they all set out to cast light on real-world events: the political response to Amazonian forest fires, growing abuses of tear gas in the policing of protests internationally; the mutually supportive links between perpetrators of far-right killings and their social media milieux; the use of arms supplied by the UK, US and other NATO allies in the targeting of non-military targets as part of the Saudi-led Coalition campaign of airstrikes in Yemen; and the use of corporate accounting practices to disguise corporate accountability and wrongdoing in the case of such things as environmental damage and fraud. Bocking-Welch, Huzzey, Leston-Bandeira and Miller, and Godfrey's contributions work slightly differently, examining respectively, as discussed, the processing and fate of individuals via their official points of contact with the British criminal justice system and the practices of petitioning over time. However, as with the other studies, recorded contacts with the system and specific petitions provide a concrete investigative focus. Thus, our contributors work contributes to the construction of knowledge around their investigative objects – and many of our contributors seek to contest claims made with respect to them – and that process involves arriving at new understandings of, for instance, CKDnt, the use of force in armed conflict, far right violence, the lives of convicts, petitioning or fraud.

Second, the objects which provide investigations with their initial *point of focus* are typically unavailable to direct observation meaning investigations must take at least part of their lead from 'trace' data as a critical source of evidence that can be repurposed to access and reconstruct those objects indirectly. That is, although the conclusions of investigations may well be present or future-oriented, the substance of investigations have a retrospective rather than prospective character. All of the contributions here are historical in the sense that they deal with and attempt to make sense of things that have already happened: the petitions have been submitted, the convicts processed, the attacks launched, the fires lit, the crimes committed and the deaths logged. As they have already

happened and so are no longer there to be studied directly, investigators have to devise other ways to study them. It is here, we believe, that the real distinctiveness of investigative methods starts to come to the fore. Instead of constructing indices or relying on interviews after-the-fact, investigative methods make use of the myriad traces events leave behind, increasingly in digital form, to reconstruct them. In many cases the resources used in these reconstructions are official records: parliamentary lists of petitions submitted, coroner's and cause of death reports, court records, photographs and video routinely produced in operational settings, published accounts, government briefings and more. At the same time, and because they are often highly contested, events leave traces outside official records too: in newspapers, prominently for the past few centuries at least, but also in books as well as more transient media, including letters in the past and text, images, video, and more posted on social media platforms today. In contemporary investigative research, much of this trace data is recovered from digital public domain repositories, repositories in which the sources are themselves traceable or 'open'. As a consequence, they are often referred to as 'open source investigations' as a way of flagging the provenance of the trace data they work with (and see the Lyndon and Nyarko and Waters' contributions specifically in this connection).

Traces derived from these sources are not merely data, however, they are typically produced as part of the very thing being investigated. For this reason, trace data has itself to be problematised and accounted for and not simply taken at face value. As Whyte points out, for instance, the very accounting practices by which the activities of corporations are made public are at the same time the practices by which much of their activities are rendered invisible and unaccountable. Similarly, cause of death reporting around CKDnt in Glaser and Kierans' work is not the reporting of fact but an acknowledgement of an inability to specify causes, a problem as related to social, political and economic issues as blindspots within the biomedical field of vision. Indeed, both are related in contexts where diagnostic clarity would have serious political consequences, opening up difficult questions about labour relations and global commodity production under conditions where those in the poorest communities are being worked to death. Godfrey's investigation of court and police records up to the early 20th century offers another variation on this theme. In this case the issue was not just what the records revealed about individuals but about the interest the criminal justice system and wider British state took in them. Insofar as that investigation could arrive at accounts of lives, therefore, it was of individuals within a very particular kind of society which sought to shape those individuals in highly specific ways. Similarly, for Brace, comments posted on far-right discussion boards were both a resource for understanding the activities of the far right and one expression of them (see also Lyndon, Tse, Moore and May-Hobbs). Finally, and perhaps most bluntly, the work of Holder, Elsey, Kolanoski and Mair, Lyndon and Nyarko, and Waters uses official records as trace data but puts those official accounts to the test of public domain evidence to see whether they stand up. In these investigations, official claims about what the evidence shows thus typically appear as a critical foil. Looking differently and reading the evidence "against the grain" (cf. Benjamin 1940) in these ways is not easy since trace data has to be used in ways those who created it did not anticipate, would not have expected, or actively sought to anticipate and block. Nonetheless, it is a mainstay even hallmark of investigative research; an imaginative capacity practitioners must learn to exercise. Exactly that capacity is on display in another of Ginzburg's famous works, *The Cheese and the Worms* (2013), where he used inquisition trial transcripts to trace collision points between elite ecclesiastical knowledge projects and popular culture in the 16th century, reading against the grain of those records to make them speak to their social, cultural and political context in ways their creators did not intend and could not have foreseen – an approach most closely echoed here in the work of Watson, Meehan, Lynch, Nave and Dennis.

Three, this trace data acquires significance not on its own but by being linked to other data in bespoke *evidentiary chains*, *catenaries* or *assemblages* worked up as part of the investigation in question.

In the tale relayed by Ginzburg, for instance, the three brothers work from the patterned character of the tracks the animal left behind along with other trace data they uncover at the scene. Similarly, within contemporary investigative studies singular pieces of evidence or even single kinds of evidence are usually of limited import unless and until they can be linked methodically to other pieces and kinds of evidence. This is not a matter of triangulation as such, although elements of that can be in play (and in the original geographical sense too as Waters discusses in relation to Bellingcat's work). Rather, it is a matter of methodically following particular kinds of investigative lead as far as possible and then making inferential leaps to other kinds of trace data that could take an investigation further still. By building up these evidentiary chains, the goal is to trace or allow the tracing of chains of associations, leveraged from what is available, in order to develop a progressively sharper picture of the object of investigation. As this is a matter of piecing together such chains, investigations can be judged on the probity, security and strength of the linkages the investigator is seeking to make and investigators take great pains to ensure they can withstand critical scrutiny. While Godfrey's work is at the more formalised end of these practices of data linkage, we see them at work in all the contributions. To take another example from the collection, in Waters' report on Bellingcat's Yemen Project, a critical form of trace data was supplied by all those in Yemen who had filmed or taken pictures of airstrikes as they happened and then uploaded them to the internet. Using satellite maps and other cartographic data, it was possible to pinpoint and thus identify the targets of those strikes from those images and videos and check whether they corresponded with the accounts given by the Saudi-led Coalition of the targets they had sought to strike. Alongside geolocation, however, it was also possible to analyse shadows captured from video stills, via online tools that determine shadow length on different dates and times, to derive further insights into individual airstrikes, including the time attacks were launched and the flight path of munitions, all from images read differently in a creative exercise of investigative lateral thinking (and cf. Fujimura and Chou (1994) for a discussion of this composite approach to knowledge making in the context of epidemiology). Even when the results are impressive, however, those who make use of investigative methods have to remain alive to the limits of what it is possible to say based upon them, a theme Brace, Watson, Meehan, Lynch, Nave and Dennis and Whyte also take up in their contributions. A return to Waters' Bellingcat example is itself telling in this regard: despite the clear evidential chains they were able to construct through their investigations, their legal force in court cases against British arms manufacturers and the UK government in relation to the sale of arms to Saudi Arabia remains by no means a certainty.

Four, where the investigative targets are particularly complex, as is so often the case in contemporary investigative studies, the process of data gathering, assessment and analysis is *distributed* and *collaborative*, something which demands its own systems and methodical approaches. Complexity can be produced deliberately, as in Whyte's case of corporate structures or in Brace's case of anonymous social media accounts. Complexity may also emerge because of the kinds of data that have to be leveraged relative to the object. Examples here include having to handle a surfeit of videos, images and social media posts in Lyndon and Nyarko's investigation into tear gas abuse, i.e., the *scale* of the available data, or the poor resolution of video captured by police body-worn cameras in Watson, Meehan, Lynch, Nave and Dennis's investigation, i.e., the *quality* of the available data – with both issues often present together, as in for example Waters' contribution. Many of the contributions describe multidisciplinary teams with various methodological and domain-substantive expertise as a result. In processes of data collection, various kinds of evidentiary expertise are needed; for instance, the capacity to navigate diverse forms of official records and archives, or the capacity to find and download social media content often in several different languages. Furthermore, with regards to data, detection is often concerned with mitigating ephemerality: clues decay. Physical and digital evidence thus needs to be preserved and archived, often in ways specific to the investigation, and made available to different members of the investigative team and potentially others thereafter in a secure way. In the contributions to this

collection, that process frequently takes the form of digitised processes. For example, Waters' account of an attempt to bring together a diverse group of experts to concretise an evidence base in relation to the Saudi-led Coalition's campaign of airstrikes – in the form of a hackathon – demonstrates the importance of details in the setting up of reporting system to help keep track of particular developments across a wide range of events. Analytic processes also require multiple kinds of expertise. Bocking-Welch, Huzzey, Leston-Bandeira and Miller highlight the importance of understanding various aspects of phenomena, in their case, the political, historical and archival dimensions of petitioning. Through processes aimed at verifying evidence, Lyndon and Nyarko and Waters' investigations draw on local experiential knowledge as well as various online tools for chronolocation and geolocation alongside expertise in the deployment of weapons and tactics by military and security forces and expertise in assessing their damage. However, communication and digital tools like internet teleconferencing and file sharing, mean that analysts themselves need not be co-located. Thus, many of the investigations find ways gather, store and interpret disparate forms data across a geographically and methodologically distributed investigative team. In all these ways, investigative methods emerge as the work of many hands.

Finally, five: the ultimate aim is not just to know or understand the objects of investigation better, important as that is, but *to intervene*, whether by overturning an existing account or by opening up space for action on the issues the investigation has identified, something which itself can take many forms in relation to the contemporary politics of evidence. Brace, for instance, situates his work as an attempt to better understand the links between far-right discourse and far-right violence for the purposes of preventing the latter. Glaser and Kierans, Holder, Elsey, Kolanoski and Mair, Lyndon and Nyarko, Lyndon, Tse, Moore and May-Hobbs, Waters, Watson, Meehan, Lynch, Nave and Dennis and Whyte, by contrast, all advocate for greater forms of political accountability with respect to the direct harms to people and the environment caused by the forms of state and corporate malpractice their work identifies. Bocking-Welch, Huzzey, Leston-Bandeira and Miller. and Godfrey advance a politics of evidence that is different again. For Bocking-Welch, Huzzey, Leston-Bandeira and Miller, foregrounding the important but contested role of petitioning in democratic societies serves as a warning not to reduce politics to its parliamentary expressions. For Godfrey, and the Digital Panopticon Project more broadly, one of the reasons for undertaking this kind of research is to make the information upon which it was based public domain and to knock down the paywalls which had surrounded it in the past. In this way knowledge and action can be seen as intimately connected elements of the investigative approach.

Conclusion

Taking the five points together, we suggest that investigative methods are oriented to narrative *reconstructions* of biographies, acts, events, practices and networks. Investigations often privilege one form. For instance, Lyndon and Nyarko's work on tear gas reconstructs events: the points at which tear gas is deployed in ways that, when the evidence is assembled, appear to contravene international law; Godfrey's Digital Panopticon project reconstructs biographies of convicts, told through the machineries of state law and punishment; Holder, Elsey, Kolanoski and Mair use video and inquiry testimony to reconstruct the legal use of force in armed conflict, with Watson, Meehan, Lynch, Nave and Dennis reconstructing such reconstructions by courts in relation to the use of lethal force by the police; by contrast, Brace, Whyte, and Lyndon and Nyarko all focus primarily on reconstructing networks, as evidenced through traces on social media or through the practices of corporate accounting. We recognise, of course, that there may be many other ways to divide and discuss these methods, including the different forms of data involved, their subject domain, their politics and so on, but as we see it reconstruction constitutes a particularly useful way to conceptualise their orientations to the phenomena on which they focus, something we again draw

out from Ginzburg's important initial work and see as having a broader relevance within the social sciences.

In this introduction, we have tried to balance a discussion of the methodological characteristics we believe link different kinds of investigative research with an overview of the contributions that make up this *Innovation Collection*. We felt a conceptual and methodological guide that would enable readers to see the connections between the contributions might be a useful introduction to them and we've therefore tried to provide that guide here. Our treatment of investigative methods has been ideal-typical and more or less deliberately so. We have tried to draw distinctions and offer criteria that bring this domain of research practices more sharply into view even though we know things are blurrier in practice. We have done so because we believe the kinds of investigative methods detailed in our ten contributions are indeed distinctive, representing powerful contributions to contemporary research repertoires by offering an alternative approach to knowledge making, and thus sought to paint our outline in bold. We are keenly aware, however, that we have only scratched the surface of the latter in particular, so it is up to readers to decide how well we have done. Happily, however, the contributions stand independently and can be judged on the basis of their own significant merits, something we would urge readers to do for themselves.

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1. Digital Verification and its Discontents: Investigating Tear Gas Abuse in a Digital Age

Rebekah Lyndon and Michael Gyan Nyarko (Amnesty International Digital Verification Corps, Cambridge University)

In this contribution, Lyndon and Nyarko highlight the processes involved in verifying relevant material in open source investigations. Focusing on the worldwide abuse of tear gas – used by authorities as a so-called "less-lethal" weapon – the authors also outline some of the pitfalls and ethical concerns faced by researchers. Beyond the promising approaches offered by digital verification techniques, Lyndon and Nyarko advise that we recognise and carefully negotiate the tensions involved in order to attain a higher standard of digital ethics.

Introduction

Amidst selfies and memes, social media hosts content that serves different purposes: recent years have seen a proliferation of recordings by eyewitnesses of human rights violations. This user-generated content (UGC) includes evidence of human rights violations, a source that human rights researchers increasingly look to for evidence of human rights violations (Aronson 2018). Offering critical documentation to a digital public, these witnesses expose how law enforcement bodies' use of weapons can amount to punitive rather than safe, legal, necessary, and proportional deployment. Their uploads are reshaping the nature of human rights investigations. One of our recent projects addressed the worldwide abuse of tear gas as recorded by eyewitnesses – a substance whose status as a so-called "less-lethal" weapon allows it to be used by police forces against crowds of peaceful civilian protestors. In this paper, we highlight the processes involved in verifying relevant material and some of the pitfalls and ethical concerns faced by researchers in open source investigation.

An Evolving Context: Human Rights Violations, Online Documentation, and OSINT

Human rights practitioners have increasingly turned to social media and other open-source content as part of their pursuits of accountability, whether raising public awareness or as evidence in legal contexts (Minogue and Makumbe 2019). This provides a complement to interviews of witnesses that have historically often been framed according to the priorities of a distanced interviewer rather than the interviewee's experiences, and that can risk re-traumatisation. Trauma may affect memory, and images and videos can draw attention to the survivor or witness' perspective, while often adding context on spatial and group dynamics.

Amnesty International's Digital Verification Corps (DVC) – trained volunteer groups currently based at human rights centres at seven universities globally: Pretoria, Iberoamericana, Hong Kong, Essex, Berkeley, Toronto, and Cambridge – work alongside its full-time Crisis Response Team, primarily by assessing the validity of visual evidence of possible human rights abuses from the crises that it tackles. In 2018, we began identifying cases of tear gas abuse, culminating in an interactive online incident map released in 2020 (Amnesty International 2020c).

To reach this stage, verification was a fundamental step; accuracy is critical when the normalisation of misinformation and disinformation – and, just as importantly, our wary expectations of these – has made it easy for people in power to detract or distract from legitimate issues. Rather than presuming that online eyewitness accounts are not trustworthy, the verification process seeks to ensure that this kind of advocacy is impervious to attempts by governments or other powerful figures to dismiss people's valid claims by crying "fake news." This has allowed previous DVC

work to challenge Hong Kong police's denial of abuses against protestors and to obtain acknowledgment on the part of the US-led coalition of some of the indiscriminate damage it inflicted through airstrikes on civilian areas in Raqqa, Syria (Amnesty International 2019a, 2019b). Nonetheless, experience in verification work only serves to highlight that the process is far more complex and patchwork than the straightforward true-false binary that the term implies.

In short, open source investigations involve collecting information from publicly available sources and analysing it to draw meaningful conclusions. Our focus lay in applying a mixture of digital tools and human analysis specifically to content publicly uploaded online. These methods reflect not only the growing range of digital investigative options available to human rights researchers but also a divergence from some of the traditional ends of open-source investigations. The term OSINT – open-source *intelligence*, the findings gleaned from investigations with open source *information* – originally emerged in US defence sectors, indicating information that was not classified, or that did not involve covert or clandestine collection (Stottlemyre 2015; Williams and Blum 2018). Its usage in military contexts continues into modern times, but today we also see growing interest in OSINT from the private sector. This often relies on broad automated tracking, including problematic sentiment analysis, to gauge industry trends rather than the close human assessment of specific individual instances needed to contextualise possible human rights abuses. Human rights practitioners find themselves uncomfortable outliers in fields dominated by the private and public sectors, including murky areas of military surveillance, while simultaneously relying on – and seeking to reshape – tools defined and developed by those sectors.

Human rights activists face a range of challenges online, from internet shutdowns to the increasing threat of "deepfakes" which will potentially make verification even more challenging in the future (Witness Media Lab 2019). Yet the ever-growing swathes of online data alone present multiple obstacles to human rights researchers. At a practical level it is hard to keep track of, sift through, and make sense of all the relevant information uploaded online. Perhaps more dangerous is the resulting false sense of security that this prevalence can foster regarding the documentation of abuses – at worst, the assumption that if not provable, or not online, something must be untrue. As human rights investigators increasingly turn to online content for evidence, we must neither allow this to undermine the value placed on verbally-shared testimonies nor relent in sensitive campaigning against abuses that are perhaps harder to document on social media: in less public spaces (McAvoy 2021); where stigma may be a greater factor; where people face political or legal intimidation for publicly "slandering" those in power; where recording would be life-threatening.

The Digital Verification Process

Identifying any possible relevant cases requires practical steps to navigate the reams of online material, and often involves a reliance on applications' own advanced search functions, Boolean search terms, and third-party filtering applications like TweetDeck. We began research with text searches for terms related to tear gas in various languages. Twitter and YouTube generally offer the best starting points for locating evidence of human rights abuses; well-known and widely used, they not only host significant levels of content, but eyewitnesses are well-aware of possible broad audiences when seeking acknowledgment of the abuses they have documented. Importantly, these are sites commonly used for the public sharing of content and understood as such, whereas other sites may seem hazier in terms of privacy settings or patterns of usage, raising ethical questions around scrutinising and sharing content. The research also mutually supported some of our concurrent projects, such as investigations into police violence against those protesting for economic justice in Chile or for Black Lives Matter in the USA, where tear gas abuse was one among many forms of violence (Amnesty International 2020a, 2020b).

As we collated social media posts relevant to tear gas misuse, we created lists of buzzwords and hashtags, with careful attention to language and avoidance of automated translation. Delegation to a team member with relevant linguistic knowledge or consulting the expertise of a native speaker can ensure that details are not overlooked – for instance, including "cra." as an alternative to "carrera" in noting references to Bolivian and Colombian roads, or recognising different vocabulary for key infrastructure even across countries that share languages, such as police stations in Sudan and Syria. This critical mentality has been equally crucial when handling English-language material; regardless of language many crises involve evolving political references and slang. Collating evidence on the misuse of tear gas against Nigerian protestors in October 2020 required careful attention to alternative spellings of key hashtags – #EndSARS, #EndSarsNow, #EndPoliceBrutalityinNigeria, etc. – and terms most commonly used alongside them. In most projects, initial vocabulary lists garnered from online content in turn fed further searches, as did any key terms mentioned verbally within footage and any significant locations or timeframes we were able to identify through the verification process. Per post, we would carefully analyse any accompanying text and comments and the uploader's profile to better understand questions of provenance, social networks and related posts; to seek any indication of location or date; and to rule out obvious malicious bot involvement. Additional footage that can be identified as from the same event as another might be included, regardless of whether it depicted the specific abuse in question, as consideration from multiple angles can be extremely helpful – for instance, one might include close-up detail of an injury, while another shows no abuse but more of the environs, aiding geolocation. This understanding of the environment is a crucial stage, not only allowing confirmation of where an event took place but also an assessment of any enclosed or limited spaces where citizens would be unable to escape tear gas – despite its explicit purpose for crowd dispersal – and where its usage may arguably constitute torture. Across the globe, eyewitness footage indicates that security forces knowingly deployed tear gas in illegitimate contexts including indoors public spaces, on bridges and bottlenecks, in dead-ends, and where civilians' paths were otherwise obstructed by fixed objects.

Potential evidence should be preserved as soon as possible. The novelty of digital landscapes makes it seem incongruous to approach online material as historical evidence, but like any form of documentation, it risks damage and degradation or editing. Managing storage is crucial, as both hardware and software can rapidly become redundant (Ng 2020). Within open source investigations for human rights, a plethora of reasons complicate the longevity of online content and necessitate thoughtful archiving (Piracés 2018). A depiction of violence might be deemed as violating a platform's terms of service by an unclear algorithm or human content moderator, themselves facing infringements of their labour rights (Crider 2020). In other cases, direct political censorship is involved. Some websites experience link rot. Countless tools are available for different media, from Archive.org's WaybackMachine website preservation tool to the independent, open-source Youtube-dl software for downloading audio-visual content, accessible on GitHub. Physical drive-based storage often provides better security, while cloud-based options are easier for collaboration. Ultimately investigators must find a structured approach to research while still disallowing complete routinisation. This is due to a need for space to query rather than accept ethical issues around the non-neutrality of data, digital tools, and the online infrastructure itself, as well as to adapt to changing technologies and patterns of internet usage.

Often, content needs scrutinising multiple times, focusing on different elements separately before verification. Carefully ascertaining what is happening with the gas is essential to determine whether it is being abused; identifying key individual officers can allow investigation of the broader chain of command beyond the event; noting any close-up detail of canisters can facilitate further analysis of shipments, trade, and manufacturing. Local identifiers can help with geolocation – these can include anything from the style of road signage and vehicle registration plate formats to dialects

spoken. Typically relying on web searches, researching details like these is the simplest and most intuitive part of the process, yet still requires discerning and conscious use of search engines. Options include setting up a fresh browser profile cleared of history and location, to mitigate skewing results to a personalised footprint, and using Boolean search terms to render more appropriate results. Countless tools and databases exist to help with identification of details, preservation, image analysis, search organisation, analysis of public data, and geolocation, but websites like OSINT Essentials and the Digital Methods Initiative supply excellent collations to start with, while Amnesty's Citizen Evidence Lab offers blog-style guides for open source research.

When developing methodologies, there is often an attraction towards complexity, perhaps especially when operating in collaboration with academic spaces where constant pressure is placed on proving research relevance. Yet human rights investigators must be wary of tools that may appear more compelling merely due to novelty, impressiveness, or exclusive training required; rather, simplicity and replicability are crucial to ensuring that this work remains accessible not only in its basis in open source information but in terms of the tools and methodologies used. Many open source researchers archive content with programmes that require a basic knowledge of the command-line or python, but tools that require no coding knowledge are often as effective and these questions should not distract from the fundamentals of secure storage and good organisation – preservation is undermined if it is difficult to locate a piece of evidence. It can be challenging to estimate how time-consuming footage may be to geolocate but also to determine where additional experts may need consulting in terms of weapons used, for instance, but organisation and communication over these issues need not be overly complicated. While we sometimes use tools like the valuable platform Truly Media to systematise our verification, a well-organised shared spreadsheet works just as well for our purposes. At a minimum, categories should focus on confirming time and location of a recorded incident – the crux of verification work – as well as media type, links to the original upload and preservation details, description of the action, and progress with investigation. Though seemingly obvious, the importance of consistent, agreed-upon labelling cannot be overstated, including communication on delegation and steps taken thus far with a given video – especially when working with broad teams across different locations. More broadly, when navigating the evolving meaning of "open source," researchers might take into consideration the role of privatisation and paywalls, the surrender of personal data, and user accessibility globally and in terms of neurodivergence; these questions should certainly inform research methods.

After consolidating our initial evidence base, we would start conducting reverse image searches. With videos, this involved taking screenshots of the clearest frames with the most potential for recognisable content – perhaps a unique building or identifiable landmark. Image search engines like TinEye, Google, Yandex, and Bing are particularly effective at revealing where an identical image has previously surfaced online, in anything from journalism or stock image databases, allowing us to rule out occasional cases of misinformation or instances where persons have paired their image-less descriptions of recent events with older content as a form of illustration. InVid is a particularly useful tool offering the functionality to auto-screenshot images from videos and complete reverse image searches. Yet using multiple sites, flipping an image, and changing resolution is best as each software emphasises different aspects of an image. Where content is original, pixelating out persons to emphasise background can sometimes hone results in attempting to find similar images for geolocation, but ultimately the key search engines are skewed towards content from the global North and overwhelmingly provide unhelpful suggestions. Search engines are obscure about their automated processes and never failsafe.

Human assessment of the physical built environment in any media depicting tear gas abuse was triply significant: for geolocation, chronolocation, and assessments of abuse. As such, we were

meticulous in our observation of imagery, paying as close attention as possible to the surroundings of events – often having to train ourselves to counterintuitively ignore the incident in question in favour of its background – and meticulously take note of buildings, structures, and street layouts. This was primarily central to our geolocation process. Yet once we could pinpoint a video on the map, this also facilitated our chronolocation by allowing us to identify any discrepancies or parallels with recent changes visible in any other sources, such as ongoing construction or a shop's new paint job. Thirdly, we could take this more intimate analysis of the physical spaces, enhanced with satellite imagery and other online content, to confirm any enclosed spaces preventing crowd dispersal, as outlined above.

The need for attention to layered aspects of footage – geography, language, climate, movement, weaponry, and more, often in individual freeze-frames – raises the likelihood of repeated exposure to violent imagery. Research indicates that intimacy with this kind of material has cumulative, subconscious psychological effects on viewers that can culminate in vicarious trauma (Dubberley and Grant 2017). Alongside personal and cultural appreciation of mental health, practical measures include fostering a healthy, structured work environment. Content labels are not only helpful for maintaining digital hygiene and communication while pursuing multiple tangents simultaneously, but also for mental preparation. Deliberate scheduling and a clear division in closing all digital workspaces before personal use is crucial, particularly in remote and work-from-home contexts where investigators may not be as readily surrounded by support. Though it is tempting for investigators to downplay these measures and the effects of footage, particularly in comparison to the undeniably more manifest results of the depicted actions, desensitisation is not resilience, and is not sustainable. Indeed, in order to continue appropriately recognising the weight of the content at hand and to avoid a cynicism that downplays effects of footage – initially on oneself but ultimately of the content itself on eyewitnesses and survivors – investigators must recognise that psychological resilience and self-care are central components of effective verification.

Social media posts with no description or context still provide some starting points for confirming the date of an incident; a time-stamp is default, though unreliable. When visual content is uploaded to one of the main social media sites, it is stripped of its metadata (embedded information including time taken and device and settings used). This leaves any observer reliant on the platform's time stamp, though this indicates upload time only – in the viewer or the uploader's time-zone, depending on the site – rather than reflecting the content creation. Any number of reasons may distance the timing of an online upload from the incident it purports to depict, from the physical threat when faced with armed personnel to simply waiting to reconnect to Wi-Fi.

Yet material is often uploaded soon after an incident, and it makes sense to work backwards from the time of posting, querying whether anything disallows the possibility of something having been filmed within a given timeframe. For instance, if a clip vastly contradicts the historical weather record for a given location, either the chrono- or geo-location is likely flawed. Meanwhile, daylight and shadow length can be assessed with the help of tools like SunCalc, which allows an exploration of the position of the sun in the sky relative to any point on the earth's surface on any date since 1900. Originally designed to assist photographers in making decisions about lighting, it reflects how much of this work involves an evolving toolkit of repurposed software.

Geolocation typically constitutes the most time-consuming and arguably most fundamental stage of verification. As aforementioned, local identifiers, like language or officers' uniforms, narrowed down the respective countries, and physical features within the recordings were invaluable: station signage led us to cycle through Hong Kong subway stops; deciphering the name of a supermarket meant we could identify its chains within Guayaquil. Usually clues were more subtle and entailed hours of systematically scouring satellite imagery to identify where the physical landscape lined up

with the imagery. With tear gas typically used against protests taking place on city streets, Google Street View was a rewarding tool, as well as the map function and more collaborative projects like OpenStreetMap. However, the efficacy of Street View is often hampered by its limited coverage of some neighbourhoods or countries. Well-developed countries with high internet penetration experience easily accessible and up-to-date Street View functionality, while underserviced areas may attract limited to no coverage. Geolocation is often facilitated if a team member has previous knowledge of the environment depicted in the material. For instance, Nigerian team members, familiar with specific buildings and streets depicted in some videos, helped the Pretoria team to geolocate material to Abuja far more rapidly than they would otherwise. Local knowledge remains the most useful resource for verification, and prioritising it can help reduce any problematic sense of distance between analysts and witnesses.

Google Earth Pro, the free desktop version of the software, offers advantages over the website, particularly in terms of historical imagery and annotation options. By including sliders that toggle between current and previous satellite imagery of a given area, changes in the physical environment can confirm that a recording took place subsequent to a given date. Where there is no significant change, even slightly different angles in the aerial view can provide additional insight helpful to confirming the location of an event, especially where Street View is unavailable. Meanwhile, options to create, save, and share annotations and measurements of distances – whether the width of a crowd's exit route or the approximation of a building's shadow to help gauge time of day – facilitate collaborative work and clear documentation.

Yet this reliance on satellite imagery brings us back to questions of how human rights researchers relate to other investigative motivations. It is important to recognise continuities even within fast-evolving methods, and to reflect upon how they may affect both the tools we use and the way we frame and conceptualise issues. While we cannot take responsibility for the purposes to which others use the same tools, it is worth reflecting on what they were initially designed for. For instance, Google Earth owes its main functions to Keyhole EarthViewer, a mapping software backed by the CIA's venture capital fund In-Q-Tel before Google acquired Keyhole, Inc., in 2004 (Garfield 2015; Levine 2018). More broadly, much of Silicon Valley's prowess is rooted in the federally-funded development of technologies for electronics and communications for defence purposes during the Cold War and Second World War (O'Mara 2019). StreetView faces significant criticism for privacy violations (Zuboff 2019). It is incumbent upon researchers to pursue awareness about technological power and global positionality, raising questions about the reasons for the quality and frequency of imagery in certain areas and not others. Researchers should be wary that the novelty of digital techniques does not displace reliance on invaluable local knowledge. The techniques that human rights practitioners rely on in the digital age are not always as new as we might first assume; nonetheless, perhaps what can be innovative are the ways that we question and diversify their dominant usages.

Final Reflections and Ongoing Dilemmas

Amassing this much evidence exposed disturbing patterns about the use of tear gas worldwide. Above and beyond a single country or police force, tear gas is regularly used in ways that it never should be – with few repercussions. Though billed as a safer alternative to other weapons used by security forces, these eyewitness recordings together indicate that instances of its violent or disproportionate use against crowds are by no means unique to a single force, but rather that a lack of training is widespread and that tear gas is systemically used in illegitimate ways.

On a broader level, this also is a testament to the immense courage of civilians in seeking accountability through their documentation of those abusing their power. The video clips

spotlighted on Amnesty's website reflect how social media can be employed as a valuable repository of eyewitness content. Though social media platforms are plagued with fundamental problems in their management of issues ranging from content moderation to advertising and data privacy, our discussion of these issues should not exclude a recognition of the different purposes to which users may post and of the significance of public expression for users who may be disempowered by other means and in different contexts; those who experience human rights violations are not passive victims but have stories to tell.

After taking hundreds of individual videos through these processes, a selection of those with confirmed locations, dates, and content were visualised within a map, an online public resource to raise the visibility of human rights violations in a digital age. Amnesty's Webby award-winning wider multimedia site helps to make expert knowledge transparent and accessible, including interactive diagrams, videos, and text about the health consequences of tear gas exposure, the chemical components involved, current legislation, and the role of unregulated manufacturing. Altogether the site seeks to help users instantly comprehend the geographical spread and make sense of information they otherwise may not come across, or may assume involved an isolated occurrence. Yet, perhaps inevitably, preparing this involves something akin to an editorial vision; not only is selective filtering of data required to conduct an investigation, but any public presentation of conclusions involves parsing people's stories through a particular lens. At the very least, investigators can set a precedent of transparency by explicitly offering their motivations – in this case, to campaign for the regulation of the manufacture, trade, and use of tear gas as well as to increase visibility of some of the ways that it is misused and the experiences of those at the receiving end. Original sources should be acknowledged and linked, to allow recognition of the authors as well as to avoid decontextualisation. Yet seeking consent of actors involved is more challenging; in particular, in these high-pressure and rapidly-escalating environments, the individual recording an abuse does not have time to consult those depicted, and often does not know them. In what ways can investigators ensure informed consent, and preserve the anonymity of civilian participants while maintaining the integrity of civilian footage? Meanwhile, where content is public and open source, is it unethical to keep any meaningful collation of it private?

Difficult issues around value-judgements must not be avoided, in our own and similar projects. Sometimes we encountered clips with no identifiable geographic context, or context that multiple investigators working for hours were unable to locate. Sometimes clips depicted harrowing distress, violence, or pain inflicted that did not constitute illegal police activity and as such did not meet Amnesty's criteria for inclusion. Researchers must be wary of broader assumptions; though the capacity to record abuses of authority is often portrayed as empowering and democratising, vast imbalances in terms of bandwidth, latency, and digital literacy complicate any characterisation of possession of a smartphone as inherently equalising (Mawere and Van Stam 2020). Undertaking verification work not only requires making difficult calls but itself involves implicit understandings about authority and veracity, and often follows political and media narratives that assume an understanding of truth based on proof, and particular to parts of the global North. Does holding the powerful to account necessitate the uncomfortable tension of shaping advocacy according to the investigators' perspectives rather than those of people experiencing disempowerment? What alternatives can investigators offer? It is hard to avoid these questions in digital verification work – and this is its key strength. Beyond the promising approaches that these techniques offer for investigative practice, recognition of the tensions involved and careful, inclusive negotiation of them may just help to push others – and, crucially, ourselves – to a higher standard of digital ethics.

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2. Bellingcat's Yemen Project

Nick Waters (Bellingcat)

In this contribution, Waters outlines Bellingcat's use of Open Source Investigations to lift the veil on the abuse of power in the conflict in Yemen. Bellingcat's Yemen Project aimed not only to unearth evidence of incidents, but also to increase the quantity and quality of verifiable data being recorded in connection with the conflict. Waters delineates how this information was used in an effort to hold UK arms companies to account for the sale of weapons to Saudi Arabia for use in the conflict, as well as in a conceptual legal setting to test the admissibility of this kind of information as evidence in the courts of England and Wales.

Introduction

Six years into the conflict in Yemen and reliable information concerning violent incidents is scant. With the exception of several reputable NGOs, reporting on the Saudi-led military campaign in the country is often inaccurate or inaccessible. Lack of access to the scenes of attacks has undermined local and international reporting, shielding both state and non-state actors from accountability and allowing them to nurture an environment of misinformation by exercising airtight control on the conflict's narrative.

For reasons that will be discussed in this paper, Open Source Investigation (OSI)[1] is an untapped resource and a viable solution to many of the problems facing investigators in the context of conflicts such as Yemen's, where information is widely available online but is most useful when augmented with specific local knowledge.

Over the last seven years, Bellingcat has become adept at finding and using this kind of information to investigate events around the world. Initially focusing on the question of who shot down Malaysian Airlines flight MH17 over Ukraine in 2014, Bellingcat has used OSI to lift the veil on the abuse of power around the world. Perhaps most well-known for its work revealing the existence of a Russian state-sponsored assassination program, Bellingcat's work has included tracking police violence in the USA, examining environmental issues and revealing violence perpetrated against migrants and refugees on the border of the European Union.

With its emphasis on holding power to account, Bellingcat decided that the application of its techniques might prove useful in seeking accountability for events in Yemen. Bellingcat's Yemen Project, therefore, aimed to unearth not just evidence of the incidents, but also to increase the quantity and quality of verifiable data that is accessible to an online investigator. This information was then used in an effort to hold UK arms companies to account for the sale of weapons to Saudi Arabia for use in the conflict, as well as in a conceptual legal setting to test the admissibility of this kind of information as evidence in the courts of England and Wales.

The Yemen Project

The Yemen Project was an attempt to provide meaning to an otherwise unmanageable mass of open source information related to the conflict in Yemen. Open source information obtained from social media, local media and NGO reports provided an untapped reserve of information about the Saudi-led Coalition (SLC) air campaign. The project aimed to combine this information with local knowledge and assessments from both formally-qualified and informal subject matter experts in order to produce a series of reports examining the air campaign.

It has become commonplace for people to pull out their mobile phones and film noteworthy events as they encounter them. In the face of even extreme events, like an airstrike, some people's immediate reaction will be to record and then disseminate it amongst their personal networks, whether over social media or messaging apps. The drive to do this appears to be incredibly strong, with many risking their lives in order to capture these kinds of events on film. This isn't generally a voyeuristic action, rather it is a conscious decision to witness, and to inform others of the event and its consequences (Reading 2009).

This behaviour has manifested itself in the most extreme events and conflicts across the world, perhaps most notably in Syria, where the length of footage of the war exceeds the length of the war itself. Time and time again people subjected to the most terrible violence have recorded their experiences in a desperate attempt to show the world what is happening. This content has then been observed and further amplified by many organisations in an attempt to respond to these kinds of events.

In the context of the conflicts across the contemporary Middle East, notably Iraq and Syria, OSI has been instrumental in investigating targeted Russian airstrikes against hospitals, the civilian death toll from the Coalition air campaign and the chemical weapons campaign of the Syria government against its own people. The Yemen Project was intended as a way to formalise for the first time the collection, processing and amplification of this open source content through OSI related to the conflict in Yemen, which could then be used in advocating for justice and accountability efforts, particularly in the context of legal cases.

The Yemen Project initially began as a concept which was then put into practice in the form of a hackathon in London, followed by the writing of a series of reports examining airstrikes in Yemen. Alongside the advocacy element of these reports, which were designed to highlight issues of justice and accountability for airstrikes, they were also submitted to the UK Parliament as evidence, and formed the basis for a mock hearing to test their admissibility in court. In this case study, we will examine each of these elements of the project in turn, noting what succeeded and what did not.

Laying the Conceptual Basis for the Hackathon, Project 'Arim

In 2018, Rawan Shaif returned from Yemen frustrated at seeing first-hand the effects of the Saudi-led Coalition bombardment. She attended a workshop hosted by the Global Legal Action Network (GLAN) and realised that OSI could provide evidence in support of legal cases to prevent the sale of weapons to Saudi Arabia.

Along with Dearbhla Minogue at GLAN and Tara Vassefi, a human rights lawyer, Rawan Shaif at Bellingcat settled on the idea of a hackathon at which a large number of researchers would come together to use OSI to investigate SLC airstrikes.

GLAN surveyed the legal practices and principles relevant to determining the weight and admissibility of evidence and consulted with international and domestic legal practitioners. They then identified a set of basic standards which would address the core evidentiary priorities of demonstrating impartiality, chain-of-custody, record-keeping and the pursuit of all reasonable lines of inquiry. All of these factors serve to address potential legal concerns around the quality and provenance of evidence.

Drawing on GLAN's work in preparation for this event, we created a replicable operational methodology that was written according to evidentiary standards for potential use in impact-oriented investigative journalism, academia, and legal endeavours. We drew upon the knowledge

of multiple open source investigators, as well as the expertise of specialists in archiving, journalism and the law. With this methodology we aimed to establish a benchmark for the practicalities and efficacy of conducting remote open source investigations and publish a series of high-quality assessments.

These standards were specifically designed to be "light touch": that is, to be feasible for investigators to adhere to without unduly slowing down their progress. This was the first stage in an on-going process through which this ground-breaking methodology will be constantly refined. The methodology focused on four aspects: searching, preservation, verification and analysis. Each part of this methodology was geared to increase the likely value of this kind of open source information as evidence in court. Simple steps, such as recording search terms used, clearly outlining verification steps taken and the use of analytic language in written reports were key to this. Perhaps the most significant part of the methodology was the forensic preservation of content. Within the project, this function was carried out by the Yemeni Archive, part of Mnemonic (whose work is discussed further below). Unfortunately, as well as being the most significant step in the methodology, it is also the most difficult for external investigators to replicate, as it requires a partnership with an organisation which has the ability to forensically preserve digital media.

The exercise took its name from the 'Arim Dam in Marib, Yemen. Archaeologists suggest construction started around 2000 BC. An engineering marvel of the ancient world, it is the world's oldest known dam. The Sabaeans built the dam to store the periodic monsoon rains that fell on the nearby mountains, allowing the collected water to be redirected into an irrigation system that nurtured the kingdom's vast gardens and made agriculture possible. Despite several breaches over its long history, including an airstrike during the conflict, parts of the dam still stand today. In naming this exercise after the dam, we sought to signal our hope that the framework we sought to devise would have some degree of longevity and durability.

Phase 1: Project 'Arim – The Hackathon

In late January 2019, for four days, Bellingcat and GLAN brought together over 40 open-source intelligence (OSINT)-trained investigative journalists, technologists, and lawyers to combine their expertise and investigative capacity to discover, verify, analyse and preserve a dataset of 100 aerial bombardments allegedly carried out by the Saudi-led Coalition occurring in Yemen between the 25th of March 2015 – 31st of December 2018.

Hackathon attendees included formally qualified subject matter experts, such as ammunition specialists, linguists, and legal experts, but also subject matter experts without any formal qualifications who were recognised to be experts in their field. This included attendees who specialised in geolocation, chronolocation, or had other unusual but relevant skills or knowledge and who were recognised as experts within their peer group. The plan also included Yemeni journalists joining via video link, however, technological problems meant this was not possible. As such local contextual knowledge, which was recognised as being an important part of the investigative process, was limited for the hackathon itself.

The first day consisted of training in open source techniques, the methodology, as well as an introduction to the teams and subject matter. The remaining three days were spent investigating alleged airstrikes. Each team was assigned a number of incidents related to different categories derived from restrictions within International Humanitarian Law (IHL), the body of rules which sets out legal limits to the use of force in armed conflict:

1. Attacks on Objects Indispensable to the Survival of the Civilian Population
2. Attacks Causing Grave Civilian Harm
3. Attacks on Objects with Specific Protected Status
4. Destruction of Civilian Property
5. Attacks on Government Buildings Which Are Not Military Objectives

The attendees conducted open source investigation on incidents which appeared to fall under these categories, while subject matter experts provided expert opinion on matters such as geolocation or munition identification. Data points from these investigations, such as the time of day, the munition used and the target were collected and input into a data sheet.

The result was a huge collection of data gathered from social media, local news outlets, blogs and other online sources of information, comprising images, videos and texts regarding the incidents of interest. Some of this was structured, such as specific data points added to the data sheet, some was semi-structured in draft reports, and some was unstructured and listed as links within those draft reports. Initially the intent had been to complete full reports of all 100 strikes during this hackathon, however it was clear that this was not feasible due to time constraints and a lack of consistent reporting style across the large number of investigators.

A core purpose of the hackathon was the collection of open source information. Two of the major constraints on this were the need to archive open source information gathered as part of the exercise and the requirement to verify that each piece of information was actually related to the incident in question, which are discussed below. This not only formed the basis for assessing and linking the content, triangulating multiple pieces of data across each incident, but also allowed us to be confident about the individual data that was collected, and establish the provenance of the content, potentially an important question if the content was to be used in a legal context.

Archiving

One of the major issues which affects open source investigations is the availability and longevity of relevant information. Although content relating to airstrikes may be posted online, there is no guarantee that it will remain there. For a variety of reasons, content relating to extreme and violent events is often removed from platforms. The content may be identified by an automated algorithm as breaching the rules of the platform upon which it is hosted; it may be reported by bad-faith actors who disagree with the content; it may have hostile and fraudulent copyright claims made against it, or indeed the user themselves may choose to remove it from the platform (Banchik 2020).

To reduce the impact of this, the Yemen Project developed a protocol for preservation which covered both the content itself, and the method by which it was discovered. In order to preserve the content, we partnered with the [Yemeni Archive](#), part of Mnemonic, a non-profit which specialises in the preservation of online content depicting conflict. The URL of any content investigators wished to preserve could be entered into a spreadsheet which would be subsequently preserved and digitally hashed to ensure its integrity.

However, the Yemeni Archive cannot itself track an investigator's journey. As such, a tool called "Hunchly" was used to do this, noting which websites were visited and what media was viewed, as well as creating a PDF of the page itself and a hash, a kind of digital fingerprint, of that visit (Roussev 2009).

The combination of Hunchly and archiving by the Yemeni Archive mitigated the majority of the issues resulting from the removal of content, as well as the chain of custody of this content, however gaps still remained. A minority of websites were not compatible with either Hunchly or the Yemeni Archive, resulting in either partial capture or no capture at all. Human error was also present, particularly at the hackathon stage, where some were not familiar with the software, or forgot to use it as directed. Considering human nature, as well as the multitude of differing formats websites take, these factors will continue to exist and must be recognised in order to mitigate it effectively.

Verification

The issue of erroneous images or videos being used to support news reports is one that is already well known. This kind of erroneous information most commonly tends to be content from a completely different incident being relabelled as being from the incident in question. Occasionally [footage from films or video games may be passed off as real footage](#). It may even be possible for a malicious actor to try and create an entire video from scratch and claim it is from a particular incident, although such an attempt would be very complex and is certainly not common. Indeed, it has been argued that [repeated claims of footage being manipulated may in fact be more damaging than the risk of these kinds of manipulated videos](#).

The vast majority of erroneous images or videos can be identified by the act of verification using geolocation and chronolocation: placing the content in time and space. If done correctly, these simple actions, although sometimes extremely complex in practice, will systematically remove the vast majority of erroneous content.

Additionally, contextual verification can help assess if a piece of content is genuine. For example, an airstrike in the middle of a city will result in a large number of people taking images and videos of the event. If a single Twitter user claimed that there was an airstrike, but no other users did, then it's unlikely to be a genuine claim. Similarly, inconsistencies in weapon effects, for instance, seen in content can act as an indicator that content may not be genuine.

For example, after the 2020 Beirut explosion, multiple videos appeared which purported to show missiles hitting the warehouse, causing the blast, but the size and nature of the explosion was inconsistent with any conventional weapon system. This immediately indicated that the videos had been altered to add the missiles. Once the footage was examined frame by frame it became clear [the "missile" was in fact simply clip-art added to genuine footage](#).

This type of verification was carried out on every piece of content used in analysis by the Yemen Project. This not only added a layer of verification which systematically excluded erroneous information from analysis, but also produced accurate data about each incident. In multiple instances airstrikes had been reported as being in a slightly inaccurate location or time, even when investigated by teams on the ground. Through the verification process this could be identified and corrected, resulting in more accurate data.

Though there remains the possibility of actual digital manipulation of the footage itself, this is rare. It would require a digital forensic specialist to reach certainty about a single, isolated video, but steps can still be taken to reduce the risk. If multiple videos depict a single incident, then those videos can be cross referenced for inconsistencies. Additionally, if videos have been live streamed, or posted a short time after an incident, this either removes or significantly reduces the possibility of digital manipulation. Even with these mitigating steps, the opinion of a digital forensic specialist would be useful, especially with content that lacks corroboration.

Case Study – SLC Strike on the Office of the Presidency

On May 7th 2018 the SLC carried out a strike targeting the first and second ranking members of the Houthi leadership. Multiple news outlets reported that the Presidential Palace in Sana'a had been struck, yet satellite imagery revealed no new damage to the palace and no residents of Sana'a posted reports of that specific area being bombed.

However, multiple people reported on social media that another location had been struck. By examining photos and images of the airstrike posted by Sana'a residents and cross referencing multiple related images, it was possible to establish, using the process of geolocation, exactly which building was struck.

Example social media post claiming an airstrike had taken place.

In the example below, we selected buildings visible in the photo which could be identified in satellite imagery. We could then align those buildings in the image and then on the satellite imagery to establish the precise line along which the airstrike had taken place.

One of the images of this strike that has been geolocated.

Once we had this line, we could then identify the exact location, confirming it by matching features seen in images and videos with satellite imagery.

Establishing a time can be achieved either by identifying the earliest social media post mentioning an airstrike at this location, or by examining indicators within images and videos, such as the length or angle of shadows. In the still below, we see a man standing on a road with his shadow clearly visible.

The proportional length of his shadow allows us to establish the angle of the sun in the sky and so therefore the time. This can be achieved quite easily simply by entering his height as one meter and his shadow length as 0.43 meters into SunCalc, an online tool that simulates shadows at particular times and dates.
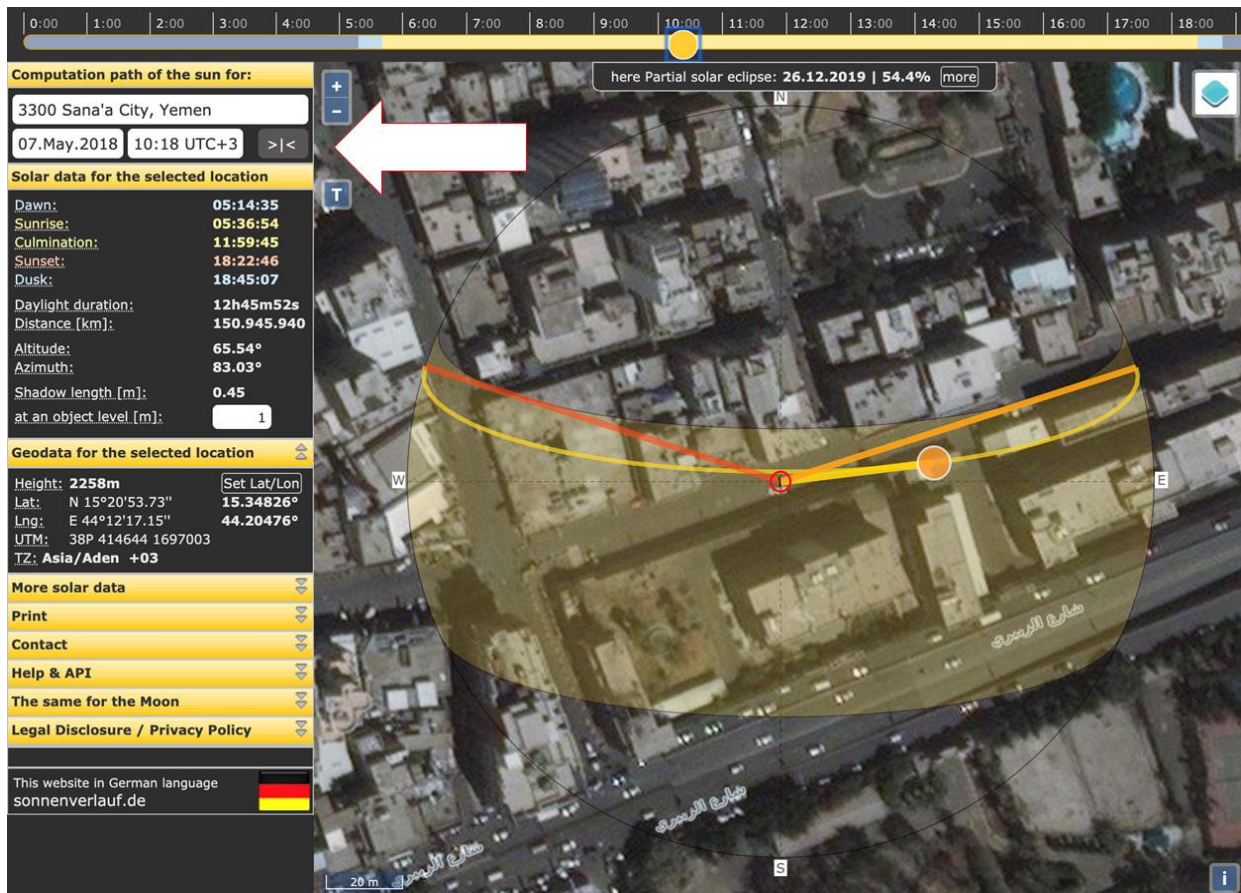
An examination of a crowd-source mapping service, Wikimapia, showed that the building which had been bombed had been tagged as being associated with the office of the presidency or presidential administration since before the start of the conflict.

This example shows the power of these verification and investigative techniques. Despite widespread reporting that the "Presidential Palace" had been bombed, it was possible to establish using social media posts and mapping services that it was in fact an administrative building in a completely different location that had been bombed.

The content obtained as part of this investigation also served to highlight how much OSI can add to an analysis of International Humanitarian Law compliance. Finding the exact location on satellite imagery allowed legal assessors to appreciate how densely populated with civilian life this area was – and how obvious that fact would have been to the attacking party. User-generated content showing civilians attempting to rescue a young casualty as a second airstrike landed could help with a legal assessment of whether the attacker knew they were targeting a civilian area and could corroborate other evidence that civilians were harmed by the attack. The extent of the destruction seen in the online footage could aid a legal assessment of whether the SLC complied with the proportionality principle. Finally, analysis by investigators suggested that the purported military targets of the attack were later seen alive.

Phase 2: Report Writing

It quickly became evident that the length and level of detail in each draft report created as part of the hackathon varied significantly. As such a considerable amount of time was spent editing and further researching these reports in order to produce output which could then be published.

To create reports in a consistent format, a report template was created with headers for specific types of information, such as date, location, nature of weapon used and so on. This made the process of laying out the findings of an investigation easier, and made it easier to fill out the data sheet directly from a report. However, this template did mean the reports were written in a particular style which did not lend itself to storytelling.

In parallel with the creation of an incident template, a process flow was created which ensured that after the hackathon each report went through identical steps, ensuring that all content relevant to the report was archived, and that all relevant data was input into the data sheet in a uniform format.

During the hackathon many incidents had been investigated, creating reports with varying amounts of links to content, analysis, and verification steps. After the hackathon, a report would then be assigned to a first author, usually part-time or freelance staff, who would structure that information and perform additional analysis and verification as required. A second author, usually a staff member with more experience, would then examine the report, check its conclusions and edit it for style. At this point the report was then published on yemen.bellingcat.com. Finally, all the links would be archived, if they had not been already, and the data from the report was input into a data sheet. The progression of each report was tracked through a matrix on a spreadsheet as due to the complexity of tracking up to 20 reports being worked on at any one time.

Phase 3: Outputs

The primary output of this project was 21 in-depth open source reports on various airstrikes in Yemen. Although information about further incidents was collected as part of the hackathon, various factors, both operational and financial, meant that no further reports were published after January 2020. A major lesson from this project was that the collection, analysis and report writing of these kinds of events is a process which requires considerable investment of time. This becomes even more significant when the reports are being investigated and written to such a specific framework given the strict standards embedded within it.

Six of these reports formed the basis for a submission to the parliament of the United Kingdom to demonstrate the risk of British weapons being used in breaches of International Humanitarian Law (IHL). Despite this, and many other submissions, the UK government decided in July 2020 to continue the sale of weapons to Saudi Arabia. Although the government acknowledged that there were "credible incidents of concern" where breaches of IHL may have occurred, they ruled that these were "isolated incidents" and as such there was "not a clear risk" that UK arms might be used in breaches of IHL.

In February 2021 a mock hearing was organised by GLAN with Swansea University School of Law in which one of these reports was used as the basis for expert testimony. Undertaken with experienced QC's for both the prosecution and defence, with Judge Joanna Korner presiding over proceedings, the purpose of the hearing was to establish if this kind of open source information could be accepted as evidence by an English court.

The mock hearing was based on a fictionalised court case in which Bellingcat had submitted a video as evidence. Bellingcat investigator Nick Waters, acting as the independent and fictionalised witness "Frank Palmer," had produced a verification report on this video. The video and the expert report were scrutinised during this mock hearing to establish whether they could be accepted as evidence.

Judge Korner deliberated and ultimately [decided to accept this kind of information as evidence](#), although she noted several caveats and aspects that stood against her decision. The most significant of these was the need for a digital forensic assessment of whether an image or video had been manipulated. Although an OSI analyst may be able to identify a poorly manipulated example, it is difficult to reach complete confidence without the opinion of a digital forensic investigator. She also accepted that "Frank Palmer" could indeed be an expert witness. This ruling, although made as part of a mock hearing, is potentially significant. Although it cannot be cited in court, it is a useful indicator of how an actual court in England of Wales may react to this kind of information being presented as evidence.

Conclusion

From its inception in 2018, the idea behind the Yemen Project was ambitious in both scope and intended outcome. Its aim was to plug the evidentiary holes that currently prevent justice and accountability areas of conflict around the world. In order to do this the project used the most up-to-date open source techniques available, collecting, verifying and preserving images and videos of SLC airstrikes across Yemen.

It was not, however, without its problems, and similar projects could certainly improve on it. The project was fantastically successful at bringing together a diverse group of people for the hackathon, producing a huge amount of data related to incidents in question. However, due to technical difficulties at the time, it was not possible to communicate with the Yemeni journalists, who should have been central to the event, and who were due to join. The scale of the information collected, and the detailed nature of the incident reports, meant that the ambitious scope of the project was never fully realised. The project did not achieve its target to publish 100 reports, managing only 21. It quickly became apparent that the level of resources required for these kinds of reports was significantly higher than was available at the time. Despite this, 21 high quality reports detailing strikes which caused gross civilian harm were published. Seven of these 21 reports formed the basis for a submission as evidence to the UK Parliament's Committees on Arms Export Controls. In summary, then, the novelty of this effort also meant that much of what was done was breaking new ground, sometimes effectively, sometimes less so.

In other respects, the project was certainly successful. It resulted in the production of a light-touch and easily replicable methodology for investigating the kinds of events that are most likely to feature on the open-source record. It resulted in the reports that were produced by this methodology being submitted and accepted as evidence by the Parliament of the United Kingdom, and it led to a mock hearing accepting the kind of information collected and verified in this way as evidence. Now that this information has been deployed in efforts to hold arms suppliers to account, only time will tell whether it will prove useful in a real prosecution.

These lessons have formed a basis of knowledge which will be applied to further iterations of this project. Ultimately, we hope that the successes and failures of this project so far can inform others who wish to carry out similar projects, and further the potential for the use of open source information as evidence to hold the powerful to account.

Notes

[1] The author uses the terms open source investigation (OSI) and open source intelligence (OSINT). These processes often make use of similar open source digital data are distinguishable mainly by output, where OSINT produces analyses that can be used for decision-making, particularly in security contexts, and OSI does not produce analyses for such purposes.

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3. Investigating the Use of Force in Contemporary Conflict: Researching Military Operations with Audio, Video and Transcript Data

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Using public domain video and/or audio-recordings, transcripts, internal reports and inquiries as data, the authors investigate specific and often highly controversial incidents in which Western militaries employ the use of force. Analysing the interactional organisation of such incidents as they unfold "ethnographically" (incorporating fieldnotes, interviews, biographical accounts and other relevant resources), their collaborative research examines the assessment of threats, the identification of combatants and the distinction between lawful and unlawful military action as interrelated and co-established features of that work. Of interest to social researchers but also military personnel, lawyers and campaigners, among others, this case study outline how they methodically investigate the use of force with reference to a particular case, the Uruzgan incident, using available interactional data and related resources while remaining alive to their very real limits.

Introduction

When it comes to investigations of real-world incidents and events, the tendency to hold to pre-established views on what must have been involved without first understanding the contexts and practices any given investigation might take up represents a significant initial misstep. Take critical incidents of various kinds – consequential errors, breakdowns, accidents and so on – within the complex worksites and workplace practices entailed in contemporary surgical procedures, supply chains or military operations. Making sense of what happens within complex settings of this kind requires that the researcher get as close as possible to the real-time activities and actions which constitute the domains involved. A key part of investigative work in such domains is, therefore, gaining an understanding of the structure of social practices so as to understand the specific ways in which critical incidents unfold from within them. Attention to incidents in these terms is one of the hallmarks of the sociological traditions of Ethnomethodology and Conversation Analysis (EMCA), the approach we adopt in our work. For the purposes of the current paper, in order to outline our ethnomethodological approach to investigative research we focus on military air-war practices as a window into how war is conducted as real-time work. Given the extreme levels of secrecy regarding the operational details of military activities across the world, a considerable part of the challenge faced by investigators in describing this work resides in a scarcity of available data. This is particularly limiting as EMCA's investigations often rest on ethnographic/observational research methods, as well as audio/video-recordings of interactions. Maurice Nevile's (2004, 2005a, 2005b, 2006) excellent study analysing civil aviation flights from pre-take off all the way to landing at the destinations is a useful comparison in terms of access.

There are ways in, however. Over the last 20 years a number of high-profile military controversies have led to a wide variety of different data sources being leaked to the public to expose the "mistakes" of military actors, and on rare occasions governments have themselves elected to release information concerning their own activities. One thing both the "leaks" and more controlled releases demonstrate is that modern militaries produce huge amounts of information about each and every airborne mission they undertake, with documentation including video recordings from cockpits and audio-recording of communications between personnel in the air

and troops on the ground. However, from an investigative perspective, often of equal analytic significance to these records is the documentation which surrounds such critical and often highly controversial incidents: internal investigations or formal legal proceedings provide vital information regarding the contextual details of the incidents as well as the ways in which militaries respond to them. While we have access to more of these cases and the substantial records which accompany them, however, the number remains small and they are challenging to work through. In terms of our work to date, we have collaborated on analyses of the following cases, records of which are all available in the public domain:

Feature of incident	190th Fighter Squadron/Blues and Royals Fratricide	Baghdad Airstrike, aka "Collateral Murder"	Kunduz Airstrike	Uruzgan Incident
Year	2003	2007	2009	2010
When/how made public	2007 Leak to The Sun newspaper.	2010 WikiLeaks	2009 First report about civilian deaths by the Washington Post.	2011 FOIA requests by the Los Angeles Times and American Civil Liberties Union.
Location	Ad Dayr, Iraq	Baghdad, Iraq	Kunduz, Afghanistan	Uruzgan, Afghanistan
Forces involved	US Air Force 2x US A10s; Convoy of 4 British armoured reconnaissance vehicles.	US Air Force, US Army. 2x US Apache helicopter, US ground forces in area.	International Security Assistance Force (ISAF) inc. German Ground Command and 2x US F15Es.	US Air Force, US Army.
Casualties	Death of a British soldier, 4 injured, 2 vehicles destroyed.	11 civilian casualties (inc. 2 Reuters journalists), 2 children seriously injured.	Estimates suggest anywhere between 30 and 179 civilian deaths.	15-23 civilian deaths. Serious injury to women and children.
Data available	Leaked video; coroner's inquest report; UK and US military inquiry's; newspaper stories (inc. verbatim transcripts).	Leaked video (full and edited versions); WikiLeaks micro-website (inc. videos still images and transcript); US military inquiry; news media.	US military transcript; video (without sound). Reports from the German parliamentary inquiry inc. transcripts of testimony; Judicial	Transcripts of talk from Predator crew cockpit & Kiowa helicopter cockpit. Interviews with individuals involved. Various other documents

			decisions; news media.	associated with the incident.
Publications	(Mair et al. 2012; Mair et al. 2013; Elsey et al. 2016; Mair et al. 2018)	(Mair et al. 2016; Elsey et al. 2018)	(Kolanoski 2015, 2017, 2018, 2019)	(Holder et al. 2018; Holder 2020)

Table 1 – Summary of military incidents analysed by research team.

These collaborations have resulted in a collection of studies of single instances of "violence as work" (Elsey et al. 2018) which provide descriptive accounts of what that work looks like and how it can be made sense of. As outlined in Table 1 above, what clearly unites these separate incidents are the tragic consequences of the missions. The loss of "innocent" lives (e.g., friendly troops, women, children, journalists) at the hands of destructive (Western) military forces shocks the public's confidence in so-called "surgical" and sophisticated weaponry and the "intelligence" that is meant to inform these airstrikes (McHoul 2007). In investigating the details of military operations, then, we are equally concerned with investigating "mistakes at work" in these specific professional contexts.

The cases outlined above constitute a unified collection of cases in many respects, each providing insights into:

- Targeting and the use of force in airborne military operations.
- Cases of target misidentification, i.e., resulting in either friendly fire or civilian harm.
- Controversial practices which resulted in public controversy.
- Multi-party interactions amongst military personnel in different roles and locations.

These emerge from:

- Unprecedentedly detailed accounts of military practices and procedures.
- Well-contextualised insights into the military machinery set up for purposes of self-investigation.

Rather than taking a stance from the outset, our ("indifferent" or "unmotivated" in ethnomethodological parlance) reconstructions of the incidents allow us to address the matter of misidentification in relevant new ways. We argue that the distinction between lawful and unlawful targeting, for instance, can be found in the practical details of the targeting process, the crucial aspect being *how* (as opposed to simply *if*) certainty in terms of target identification, alongside military readiness, of which certainty is just a part, is specifically achieved – something that can be clearly detailed only by attention to the details of the individual cases we have access to when handled in a non-judgemental way. Proceeding sequentially, step-by-step, our aim has been to investigate the use of force as a senseful, professional, practical enterprise. With a growing corpus of studied cases, we have become more and more able to determine general structural features, to decide between regular and irregular activities, and differentiate between different types of mistakes. Our investigative practices are not, however, specialised. Rather we try to explicate what took place during these incidents by drawing on ordinary competencies in our work so members

of wider publics can find they are in a position to assess them too based on the work we do. This is one way in which the use of force can, therefore, be rendered more accountable, both politically but also epistemically.

Transcription Matters

As an approach to investigations, the ethnomethodological emphasis on sequences and the real-time temporal order of practical activities ensures that the investigator focuses on the unfolding action rather than starting from the "mistake" and reading backwards – a problematic variant of "final frame" analysis (cf. Noble and Alpert 2020). A major methodological strength of ethnomethodology and conversation analysis in undertaking such analyses is the development of detailed transcripts that pay attention to the sequential aspects of talk (e.g., pauses, overlapping speech) and the production of talk (e.g., speed, volume, sound stretches, etc.) (Jefferson 2004). A foundational feature of conversation analysis in particular is an orientation to the turn-taking system that helps speakers structure and orient their talk to one another in any context (Sacks et al. 1978). When talking of sequences of action and interaction in particular cases, then, a major resource in identifying them lies in the in situ linking of turns at talk within them. In addition to identifying turns at talk, a critical task in transcription is identifying who is making any given utterance (as far as possible) not just that it has been made. From there it becomes possible to identify who is talking to who (when making any particular utterance) and also who can hear who – both particularly crucial issues when it comes to making sense of courses of action as they are being undertaken and matters of command in military settings. In two of the four incidents we studied we could work with the original audio material and we were able to apply these ways of working through transcription as part of the investigative process to existing transcripts (produced by the military for inquiry purposes or journalists covering the cases). As we discuss more fully elsewhere, this opened up a range of analytical avenues over-looked by others (Elsey et al. 2016).

Yet, in the other cases, as in the Uruzgan incident presented below, the lack of audio or video recordings of the incidents posed a potential barrier to reconstructing the incident. In the Kunduz case, for instance, where no audio track was available just a silent video, our investigations were reliant on the redacted transcript produced by the US military for the purposes of the incident inquiry. This prevents researchers from "correcting" any mis-hearings and any utterances wrongly attributed. However, using a combination of research into the organisational division-of-labour involved in employing aircraft in combat situations, the communication channels available in the various worksites, and sense-making practices rooted in turn-taking (e.g., question-answer, instruction-receipt and command-execution of command) it has been possible to strongly reconstruct sequences of interaction as they took place between different parties at critical moments in the trajectories of these incidents.

Case Study – "Uruzgan Incident"

As an example of what our ethnomethodological approach to investigations can yield, following Schegloff (1987) we want to outline a "single instance" analysis here which draws on our prior ethnomethodological and conversation analytical studies to explore and make sense of what is now known as the "Uruzgan incident." This case represents the *only* publicly available example of the work of a militarised drone crew during a real-time operation and therefore warrants fine-grained analysis.

The Uruzgan incident took place on the 21st of February 2010. It began as a US Special Forces mission to investigate a suspected improvised explosive device (IED) factory in an area notorious for insurgent activity. Upon the arrival of the Special Forces team in the area, they discovered the

suspected site of the IED factory to be deserted and intercepted communications revealed that Taliban insurgents nearby were plotting an attack on the team. At the same time, three vehicles were spotted driving a few kilometres from the village by a US Air Force AC-130 Gunship. Upon being informed of the vehicle's presence, the Special Forces team's ground force commander (GFC) announced his intention to destroy the vehicles, but the attack was delayed as the gunship failed to establish concrete evidence that vehicles constituted a hostile force. Subsequently, an MQ-1 Predator drone crew were called to the scene to train a more powerful lens on the vehicles, though by this time the vehicles had begun to travel away from the US Special Forces team.

For four hours, the Predator crew watched the vehicles travel west, seeking to "positively identify" (PID) the weapons that they were certain the passengers must be carrying. By morning, three rifles had been identified, all of the passengers had been confirmed to be "military aged males" ("MAMs"), and the vehicles' movements had been identified as a tactical manoeuvre seeking to flank the Special Forces team. At 08:46am all three vehicles were engaged and destroyed by a Kiowa helicopter team that had been awaiting summons for the airstrike by the Special Forces Commander at a nearby airbase.

At the time of the strike the vehicles were 21km away from the Special Forces team. The passengers of the vehicles were not Taliban insurgents. They were civilians travelling to a nearby town under cover of darkness to seek safety from the Taliban who were in the area and their proximity to the Special Forces team was wholly incidental. When the vehicles were destroyed, the passengers immediately surrendered and following the identification of women and children at the scene a possible civilian casualty incident was declared. In the months that followed, two separate investigations (Department of the Air Force 2010) would subsequently be conducted into the incident, one of which was directed specifically towards the conduct of the drone operators.

Though each of these investigations was critical of much of what they found, it was concluded that no one involved in the incident had violated the Law of Armed Conflict (LOAC). The LOAC (known alternately as International Humanitarian Law) is the body of law which regulates the conduct of hostilities during periods of armed conflict. It is constituted primarily by treaties, such as the 1949 Geneva Conventions and their subsequent Additional Protocols or the 2007 Anti-Personnel Mine Ban Convention, and by "custom," which is described as "the general practice of states which is accepted and observed as law" (Meron 1989, 3). Notably, there is little reference to the LOAC in the documents surrounding the Uruzgan incident. Instead, reference is more commonly made to the rules of engagement (ROEs), which are directives established by militaries themselves in order to ensure LOAC compliance whilst attending to a broader set of context-specific political and military imperatives (Corn 2016). The following short excerpt documents the moments leading up to the attack of the three vehicles being surveilled and opens up a window into what was involved.

No.	Speaker	Talk
01	JAG25	Did you contact [the MQ-1 Predator crew] and do you
02		concur that those vehicles are the same as the ones they
03		have been observing over the last couple of hours
04	BAMBAM41	Affirm just spoke to [the MQ-1 Predator crew] and confirm
05		that these are the same vehicles.
06	JAG25	Good copy just one last thing I want to make sure that we
07		do in fact have weapons PID and we have not lost contact
08		with the vehicles as well.

09	BAMBAM41	[the MQ-1 Predator crew] confirms that they had PID'd at
10		a minimum 3 weapons, 21 MAMs and they have not lost
11		PID they are continuing to observe these vehicles as well.
12	JAG25	Roger good copy and GFC intent is to destroy those
13		vehicles.
14	BAMBAM41	Understand that GFC intent is to destroy the vehicles based
15		on imminent threat to ground forces, PID of weapons and
16		[CLASSIFIED] with tactical maneuver BREAK
17		Understand we are clear to engage.
18	JAG25	Roger you are cleared to engage 1 by Hilux, 2 by SUV, 21
19		MAMs and PID weapons.
20	BAMBAM41	We will be turning in to engage we will be calling back with
21		a [battle damage assessment].

In this short passage the talk of two individuals is presented, namely that of BAMBAM41, who is responsible for flying one of the Kiowa helicopters and is responsible for its communications, and JAG25, who is the forward deployed co-ordinator of all aerial assets in the area on behalf of the Ground Force Commander in the chain of command. JAG25 is located on the ground as part of the Special Forces team and BAMBAM41 is on route to the location of the three vehicles in preparation for the imminent strike. This short exchange between the two immediately precedes the attack and constitutes the final clearance for the use of force which is provided by the GFC and communicated by the JTAC. That clearance is given at line 18, and what occurs before constitutes a perspicuous insight into the work of military personnel seeking certainty that they are about to engage the right people in a legitimate fashion.

Though the exchange is brief, it is loaded with legal and procedural consequence. First, the Kiowa and the JTAC need to confirm that the vehicles the Kiowa's "have eyes on" are the vehicles the Predator crew have been surveilling. This may seem innocuous, but the number of accidents which emerge from multiple parties talking about distinct objects as though they were the same object are surprisingly common. Indeed, it was a mistake of precisely this kind which caused the fratricidal or "friendly fire" incident in Iraq in 2003 we previously studied (and see the discussion in the next section for further detail). As it happens, in this case the Kiowa team had already confirmed this with the Predator crew, and the information needed only to be passed to the JTAC and the GFC. With this confirmation out of the way, the pair turn to the legal status of the strike. For the matter at hand, this is a conversation that could be effectively reduced to confirmation of three basic facts by the GFC, neatly summarised after-the-fact by the JTAC in an interview conducted as part of the investigations into the incident: "The three things that must exist is MAMs, tactical maneuvering, and PID of weapons. If you have those three things the engagement is within the ROE then we engage" (US Central Command 2010, 1493).

With this piece of information it is clear that lines 06-18 constitute a mutual orientation to these three requirements for a legitimate strike by both BAMBAM41 and JAG25. In the first instance, at lines 06-08 JAG25 seeks confirmation that there has definitely been PID of weapons, which BAMBAM41 confirms and further offers the information that the Predator crew has identified 21 confirmed MAMs onboard the vehicles. JAG25 then confirms that the GFC's intent is to destroy the vehicles (line 12), which BAMBAM acknowledges at line 14 and further seeks to establish whether that statement constitutes an explicit clearance to engage (line 17). As part of this request for clarity, BAMBAM41 once again provides the grounds upon which the strike would be legitimate, referring to the tactical manoeuvring, the PID of weapons and, this time, the intercepted communications which informed the Special Forces team of the suspected attack in the first place (line 16). The reference to "imminent threat" at line 15 is a more directly legalistic reference to the

legitimate use of force as self-defence. JAG25 responds to this request in the affirmative, stating plainly that the Kiowa's are "cleared to engage" (line 18) and repeats for a final time that the justification for the strike resides in the presence of MAMs and the PID of weapons (lines 18-19). The final confirmation that the Kiowa helicopter team are going to engage the vehicles occurs at line 20.

From this analysis it should be clear that both JAG25 and BAMBAM41 were explicitly oriented towards ensuring that they were engaging the right target, and that they were engaging that target in the right way, i.e., in compliance with the laws of war. Now, as we know, this strike would result in at least 15 civilian deaths and many injuries, so it cannot be said that they engaged the right target. In that light, what is truly consequential in the context of the whole incident is the way in which this interaction is set up so as to absolve both the JTAC and BAMBAM41 in the event that the vehicles proved to be the wrong target. In this sense, the talk captured in this transcript displays an overt and explicit expression of due diligence such that, in the event of an incident, the JTAC and BAMBAM41 can clearly establish that they correctly performed that tasks that they were given. In the case of the Kiowa helicopter team, that task was to carry out the GFC's intentions by eliminating a target, which had been identified for them by the Predator crew, and they did precisely that. In the investigations that followed the Uruzgan strike, the Kiowa helicopter team would be one of the few parties to the incident who would be almost entirely absolved of criticism. The same cannot be said of the Predator crew, the GFC, and JAG25, however, where specific aspects of their conduct in the build-up to the strike were criticised by US military investigators (e.g., Department of the Air Force 2010; US Central Command 2010, 21).

Nonetheless, and crucially, these criticisms do not amount to an accusation that the strike was not compliant with the LOAC. Determinations regarding the legality of the strike are of a different order to determinations of whether the strike was militarily successful, and one does not necessarily follow the other. In this regard, it is noteworthy that in cases where mistakes have occurred, and accusations can be made regarding inadequate conduct, the competent achievement of compliance comes to serve as a protective mechanism for those involved. Whatever else, the strike had been deemed compliant with the LOAC and, for that reason alone, those involved would be spared the most serious consequences of their actions. Significantly – legally, politically and in regard to research – this illustrates the power of the procedures by which military personnel ensure the compliance of their actions.

The Value of this Kind of Investigation: Detailing Military Practices / Dealing with Controversies

Inevitably, there is an expectation that there are certain kinds of "never events" that the military *should* be able to avoid during combat, principally the killing of innocent people (Hughes 1951; Omar et al. 2021). In all of our cases the mistake results from target misidentification in which the "diagnosis" or assessment of the scene and the people within it (as working together, carrying visible weapons, motivated to attack "friendly" troops on the ground) turned out to be wrong. "Never events" in the battlefield very quickly become legal and moral questions with the question shifting from "what went wrong?" to "who was to blame?" Our studies offer new insight into understanding "what went wrong" based on a thorough exploration of how things actually work. In consequence, our investigations often provide results that suggest rethinking the matter of blame as public and accountable matters.

Our cases show common "structural" features that emerge in the "overall organisation" of targeting: a target is settled on, clearance is sought and received (or given and taken), preparations are made, and the attack initiated. These are not simply phases of the action but internal aspects

of the use of force that military personnel are themselves oriented to, use and base their assessments of situations and conduct upon, both in the moment and after the fact. Given this, when we start to investigate these structures of action and interaction, we learn how the military achieves certainty about their targets and how the epistemic work proceeds as part of their activities. In each of our cases, at the *moment of attack* the military had achieved certainty and proceeds to engage legitimate targets – targets for which compliance with the legal regulations had been formally (accountably) achieved. From an ex-post perspective the engagements thereby appear "designed to absolve" the involved military personnel. In each of our studies we turned to the process of achieving readiness, to show just how the objects and individuals had been identified *beyond doubt* for practical military and military-legal purposes.

Beyond the collaborative achievement of legality in airstrikes as part of the work of arriving at targets properly at all, we also learn how military personnel look at a scene and how they treat it as a part of their respective projects. We learn that what they see is framed by the mission-accompanying rubrics but, just as importantly, the evolving and co-produced understandings built up through joint work with others. As we can see, individuals on the ground are read in connection to what happened before (in the soldier's view) and what will happen next, in terms of what the military understands about hostile intentions and in terms of their own intentions. When there is a strong wish to strike we may therefore speak of "purposed seeing" as the sense-making practices involved are tied to and elaborated in terms of a given military mission and the specific objectives it is resolved into.

We learn, further, about how military personnel work with preliminary targets – or possible targets – and turn possible targets into actual and definite targets. The data shows what can cause doubt within these processes – and what could therefore potentially stop a targeting process – and, in each of our cases, we learn how doubts are collaboratively suspended. This sometimes includes the silencing of critical voices.

This in turn casts light on the crucial connection between the "moment of detection" and the "moment of attack," a connection established through collaborative work. With the exception of the fratricide case, the incidents we studied were carried out in the context of an "imminent threat" – rightly or wrongly declared – and the individuals and objectives targeted were thus treated as "potential threats." In a situation of (supposed) "imminent threat," military personnel, at some point, have to make a decision to either engage or withdraw from what may eventually pose a threat for troops on the ground. The mission category "imminent threat" therefore suggests a particular type of relation between the moment of detection and the moment of attack, in which the process is not open and equally weighted, but in which there is a practical preference to engage (though the personnel involved may be more or less committed to such courses of action depending on the circumstances). A misuse of that mission category can therefore hardly be over-emphasised as a conditional factor.

In light of these investigative findings, it thus becomes possible to distinguish between *general* and *case-specific* features of targeting, a distinction which makes it possible to be more precise about the *types of mistakes* that were foundational in each of the incidents. While all of the incidents involved misidentification, the practical groundings of these misidentifications were distinct, and while we do not want to draw legal judgements ourselves, they expose questions of wrong-doing and fault in interesting and important ways. Our case studies, in other words, identify the relevance of different factors in the accomplishment of military readiness. Such studies make it possible to better specify what might be a conditional part of the mistake – what might be sloppy, faulty or illegal behaviour – and what constitutes and flows from normal military work.

There are incidents in which misidentification is part of normal military work. In the "Collateral Murder" case the soldiers mistook cameras for weapons in the midst of ongoing, armed conflict. Here, civilians (journalists) intentionally entered the scene (with the purpose to report) and were in the company of armed men. The military personnel involved had no (substantial) doubts about the combatant status of the men. The case-study indicates the abnormal risk for civilians in "normal" scenes of conflict.

In the case of the 190th Fighter Squadron / Blues and Royals fratricide, misidentification happened in the context of miscommunication: the personnel believed they were talking about the same target but, as our investigations revealed, the constitutive connection between "what they talked about" and "what they aimed at" had broken down as the parties pursued their collaborative work across disconnected radio channels. Our results thus highlight the extremely complex technological set-up and pressured collaborative environment in which lethal decisions are jointly established. The study illustrates the difficulties associated with continually maintaining successful communications even among specially trained and adjusted professionals.

In the Kunduz case, a misleading declaration of a Troops-in-Contact situation by the ground command initiated a targeting process in which the executing pilots were not involved in the Commander's actual plan and were thereby constrained in their capability to properly assess the legality of their activities. While legal authorities in Germany decided that the violation of procedural rules was irrelevant for the application of the international laws of armed conflict, our analysis allows that matter to be readdressed by carving out the practical relevance of the rule violations involved within the collaborative work of targeting. Within the actual course of target development, the wrongful declaration of a Troops-in-Contact situation was a *conditio sine qua non* for the misidentification to evolve and persist. The aircrew was hesitant and in doubt but had no resources to question the information they had been supplied with by the ground. When issued with a direct command to strike the target claimed to be a group of "all insurgents," they thus launched an attack that would kill more than 100 civilians including women and children.

Finally, our work on the Uruzgan incident shows a process where involved personnel worked collaboratively to dismiss legally relevant doubts about the target, working under the rubric of "purposeful seeing" connected to a pre-made decision to strike. The fate of the individuals in the vehicles was settled early, insofar as the drone was set to work on establishing legal grounds for an attack, the attack carried out by the Kiowas under the provision of the conditions outlined above. The situated accomplishment of legality is perhaps clearest in this case due to the length of the operation and the explicit direction given to the personnel involved.

Instances of wrongs done under conditions of war, particularly the killing of allies and innocents, provoke political, legal and moral condemnation of the military personnel involved. Take, for example, the UK Coroner's inquest finally conducted by Andrew Walker into the death of L/Cpl. Hull in March 2007 as a result of the 190th Fighter Squadron/Blues and Royals fratricide (Crown 2007). Unlike the separate US and UK military incident inquiries, Mr Walker concluded that L/Cpl. Hull's death was: (a) the result of not only systematic failures in military procedures, but also (b) an "unlawful killing" as it was an "entirely avoidable tragedy." In the inquest, the pilots were described as being "on a frolic of their own" during which they violated both the LOAC and their specific rules of engagement (ROE) as they had not received permission to engage (Pauline McCool, personal correspondence). To the Coroner, given the absence of a legal warrant for the attack, the pilots had acted criminally, not merely "mistakenly" or "inadvertently." These findings and the leaked cockpit video (including the two pilots' audio-feed) resulted in the controversy being widely covered in the UK media. The two US A-10 pilots were described as "cowboys" who "broke all the rules" who communicated in a "casual" and cavalier manner that shocked the public

and hurt the family of the deceased (Dunn 2007a, 2007b; Gillan 2007). It is a measure of the rightful public alarm such incidents cause that this case has recently been reinvestigated by a BBC 5 Live team with the result made available via the podcast, On the Ground (2020), an investigation we contributed to based on our examination of the details of the transcript and analysis of the subsequent military inquiries. However, despite the pronounced public interest in investigations of such cases which seek to make them accountable in their details, incidents whose occurrence we would suggest ought to be treated as "routine," expectable and structurally embedded rather than extraordinary and exogenous, two problems remain. On the one hand, publics across the world lack regular access to the records militaries generate of their own real-time, real-world practices, leaving them problematically hidden from view from a democratic perspective. On the other, when such information does come into the public domain, non-specialists frequently find they lack sufficient understandings of military practice to properly engage with and assess the materials. Insofar as our investigations show it is perfectly possible for civilian auditors after-the-fact, i.e., us among others, to arrive at clear accounts of what took place, who was involved and how far anyone's activities stood-alone or were tied into collaborations with others by interrogating real-time records, we feel those investigations also establish a strong case for demanding governments release information related to what their militaries do which enables such scrutiny. Incidents of wrongs done in war emerge from and are bound up with the ways in which war is practiced. If there is to be accountability then, in the political and epistemic senses outlined above, we need the information that will enable us to examine those practices for ourselves.

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4. Disinformation in Brazil: The 2019 Amazon Fires on Social Media

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In this paper, Lyndon, Tse, Moore, and May-Hobbs examine the online spread of disinformation about the Amazon fires in Brazil in 2019. They outline the tactics used by supporters of Jair Bolsonaro to spread a disinformation narrative across social media platforms about the causes of the Amazon fires. This is used as a case study into the various tactics that actors use to spread disinformation online and the methodologies researchers can utilise to track the spread of disinformation. The authors discuss the methods used to analyse disinformation techniques, emphasising the importance of qualitative research in addition to the use of digital tools, and set out how the process of identification can be used in future studies into the spread of disinformation online.

Introduction

In 2019 the Amazon was on fire (Hughes 2019; Mufson and Freedman 2019). Estimates by the Brazilian National Institute for Space Research (INPE) showed deforestation in the Amazon basin had increased 67 percent from January to May 2019 (Reuters in Brasília 2019), leading wildlife specialists and activists to call upon the Brazilian government to address higher levels of deforestation as a potential cause for the fires (Schipani 2019). The Bolsonaro administration, however, rolled back protections on logging and mining in the Amazon (Boadle and Paraguassu 2019; Gortázar 2019; Human Rights Watch 2020), and instead began a campaign of disinformation, blaming NGOs for the fires. In August 2019, as fires reached their peak, the Bolsonaro administration and its supporters set about cultivating and perpetuating an online narrative in contrast to global media coverage of the fires, reigniting existing anti-Globalist anti-NGO sentiments in Brazil.

This paper examines the spread of disinformation online about the Amazon fires in Brazil in 2019, using it as a case study into the various tactics that actors use to spread disinformation online and the methodologies researchers can utilise to track the spread of disinformation. We begin by identifying the research methods utilised in this case to track disinformation, including a variety of open-source intelligence (OSINT) approaches, such as Twitter data scraping, hashtag tracing, and network analysis. It outlines the tactics used by Bolsonaro supporters to spread a disinformation narrative across social media platforms about the causes of the Amazon fires, which relied on the repurposing of existing networks of conservative social media actors. It discusses the methods used to analyse these techniques, emphasising the importance of qualitative research in addition to the use of artificial intelligence (AI) tools, and sets out how the process of identification can be used in future studies into the spread of disinformation online. It concludes by highlighting the limitations of studies into the spread of disinformation and challenges for future researchers.

Methodology

As this paper looks to understand the spread of disinformation in the case of the Amazon, it is pertinent to understand what disinformation means, and how it is distinct from misinformation. Misinformation is information that, while often untrue or taken out of context, is typically believed by its spreaders. Disinformation, on the other hand, is information that is known by the spreader to be false (Wardle and Derakhshan 2018). Disinformation can be outright false or contain unsubstantiated claims, but it can also involve "creating a false connection between two facts"

(Recuero et al. 2020) for the purposes of creating a misleading narrative and passing it off as truth, which we saw in the case of the fires in the Brazilian Amazon.

Given the apparent spread of disinformation in Brazil by the Bolsonaro government our team of undergraduate and postgraduate researchers at the University of Cambridge branch of Amnesty International's Digital Verification Corps (DVC) looked to tackle a fundamental question in investigative research in the current age of disinformation: can researchers trace the spread of disinformation online? What tools or research methods can investigators draw upon in order to map these complex networks of information spread?

In previous investigative research projects, we made use of an extensive toolkit of open source investigative tools to document, verify, and monitor human rights abuses globally. In order to trace disinformation narratives, however, we had to re-evaluate these tools to address the questions of how a narrative can spread and how a narrative connects to political discourse. We began, as is usual in our projects, with the process of information gathering and verification. By gathering Twitter data, journal articles, newspaper entries, government statements and speeches, and social media posts, our team was able to analyse and verify the disinformation narrative that was being spread by the Bolsonaro administration and its supporters about the fires in the Amazon. At the same time, we gained a qualitative closeness to the data itself, allowing for a better understanding of the historical development of anti-Globalist anti-NGO narratives within Brazilian politics, and an identification of the key ways in which discourse was utilised by the administration and its supporters to perpetuate its narrative.

After conducting this general data collection, we utilised several Twitter-related tools, such as the advanced search function on Twitter itself, TweetDeck, TweetBeaver, and foller.me[1] in order to search for key terms and phrases we had identified through our general data collection as well as relevant hashtags related to the fires in the Amazon. This allowed us to parse out key influencers involved in the spread of disinformation, and to create a broader understanding of the different networks of social media actors involved in spreading disinformation about the cause of the Amazon fires. In addition to these free tools, we employed the use of Dataminr and Crimson Hexagon[2] to analyse and draw connections between large data sets on Twitter. With these paid tools, our investigative research team was able to access the Twitter Firehose[3] and quantitative and qualitative metrics about Tweets and Twitter users. We used these tools to track the historical use of hashtags across time, as well as to gain insight into closely related Twitter accounts and the shared media or hashtag use within Tweets, giving a quantitative value of number of shares or uses of specific hashtags which we could later analyse to draw conclusions about reach.

Throughout our Twitter research, there was a clear indication that the disinformation being spread was not randomised, but in fact appeared highly coordinated. We expanded our social media search to include other sites, such as Facebook, Instagram, YouTube, Reddit, WhatsApp, and a pro-Bolsonaro website, Zap Bolsonaro, that brought together both users and pro-Bolsonaro content, including content that linked the fires in the Amazon and the narrative surrounding them to anti-Globalist anti-NGO sentiments, some of which we had already seen widely circulating on social media. We then utilised Gephi, a free data visualization tool, to analyse the networks between and audience interconnectedness for YouTube users whose videos were prevalent in shared media on other sites, such as Zap Bolsonaro, as a way of tracing the spreaders of disinformation.

The nature of our research methods were qualitative and emergent as we tracked the spread of pieces of disinformation online. The following sections outline the use of these tools and methods in practice, and suggest ways in which disinformation might be traced in other contexts using the same tools we used in the case of the Amazon fires.

From Political Statements to Coordinated Tweeting

By the time we began our research, several Brazilian and international media outlets had highlighted anti-NGO comments in relation to the Amazon fires. Yet any relationship between the administration's attitudes and rampant disinformation across social media seemed vaguely asserted, and so we sought to more precisely explore its nature.

Brazilian President Jair Bolsonaro regularly gives press briefings outside his residence, often broadcast live through the President's official Facebook page. On 21 August 2019, he insinuated without evidence that NGOs were responsible for the Amazon fires, allegedly representing foreign interests in a bid to access wealth in the region (Bolsonaro 2019a, 2019b). Using tools including Twitter's Advanced Search and TweetDeck, we searched for Portuguese terms related to the Amazon, adjusting parameters to hone in on the week of Bolsonaro's statements as well as exploring broader time frames. Systematically reading through content allowed us to build lists of hashtags directly referring to the Amazon or used in posts discussing it, as well as develop our understanding of online manifestations of older controversies about NGOs and the Amazon highlighted by our previous political and historical research. We then input each hashtag into the private software Dataminr and exported .csv files for the past daily usage statistics it could render given its access to the Twitter Firehose. The software also lists hashtags most often used in Twitter posts alongside the individually-input hashtag, confirming and expanding our lists. We then brought together the separate exported data for each hashtag and created various spreadsheets and graphs allowing comparison over time and between hashtags, like the graph pictured below.
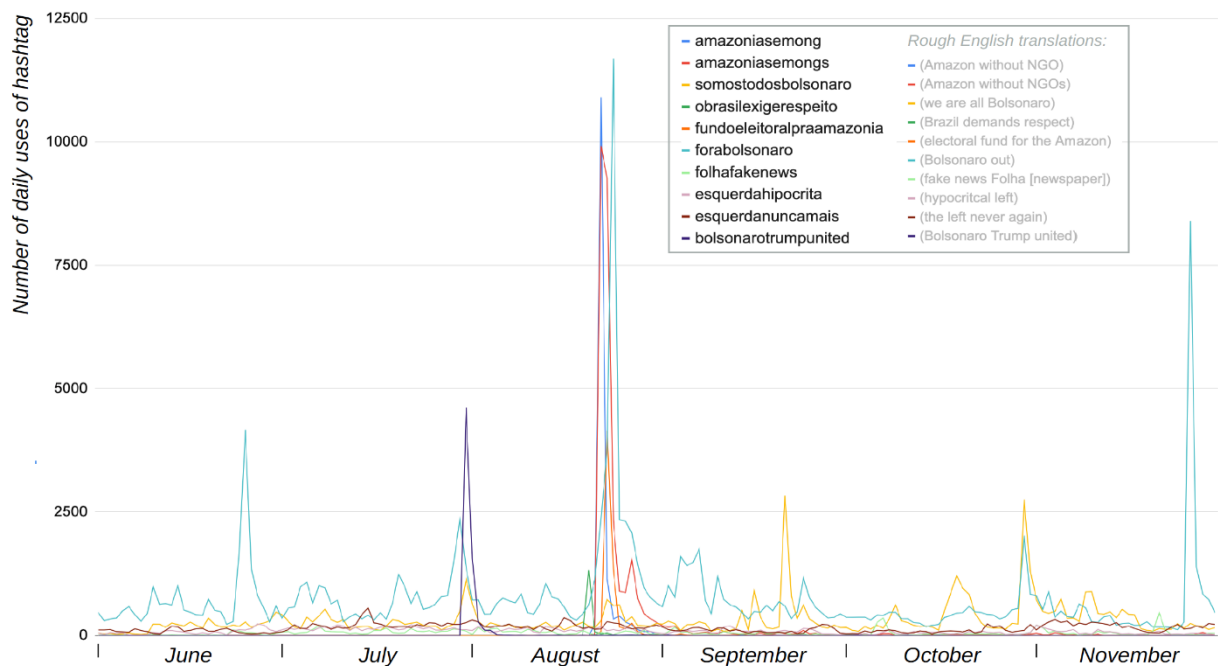
This historical view was crucial to our understanding of how usage developed on a day-by-day basis – showing a clear correlation between Bolsonaro's anti-NGO rhetoric and the rise of certain hashtags. Some hashtags rose from no or minimal use to high popularity, many of which expressed nationalistic attitudes towards the Amazon or related political stances. We also saw some anti-Bolsonaro messaging and the resurgence of election-era hashtags (see Lyndon et al., forthcoming).

We then returned to our search tools to identify patterns in online behaviour behind the spread of hashtags that promoted an anti-NGO narrative about the Amazon. Not all usage is equal: some merely tweeted the tags; others paired them with exhortations for usage to followers and other users, along the lines of "use this tag." We found the most effective uses not to be standalone, but in reply to more prominent users with high follower counts, thus gaining more attention for the tweet. Mapping out the central figures and hierarchies within the Bolsonaro administration and then meticulously reading through their public online posts in August 2019 was also crucial. While most politicians did not use hashtags, the comments sections on their posts – specifically those discussing the Amazon in nationalistic terms or criticism of NGO – were tactical spaces for the promotion of key hashtags, associated disinformation, and memes.

All the above indicated that even low-tech, free tools and methods can deliver interesting insights about the coordinated efforts of social media users in raising the profile of specific hashtags and, in turn, perpetuating disinformation narratives and political commentary. We also deduced several techniques used by the Brazilian political right to expand their online networks. On Twitter, these included: the retweeting of lists of self-described conservative and pro-Bolsonaro users; explicit series of instructions for sharing posts to build a chain of right-followers; and the use of hashtags like #direitaseguedireita ("right follows right"), #direitaunida ("the united right"), and #SDV (segue de volta, similar to "follow for follow"). Many of these and related methods existed before the Amazon fires, and tend to be used in tandem with more topical hashtags depending on the partisan issues at hand in a given political moment.

Tracing Connections Across Social Media Channels

Cognizant of the ways that disinformation spreads across interconnected platforms – and the difficulties of measuring this – we next considered how disinformation moved between different sites and what this could tell us, if anything, about coordination behind its spread. While the privacy of the messaging application WhatsApp gave us pause – both ethically and practically – in terms of researching its usage, the explicitly right-wing website Zap Bolsonaro offers some indication as to how elements of Bolsonaro's support base engage with it. Zap Bolsonaro's pages include instructions for joining large centrally-managed WhatsApp subgroups, as well as Google Drive links to hyper-partisan clips and memes for download and forwarding on WhatsApp and elsewhere (Zap Bolsonaro 2020). Amongst other topics, these included decontextualised and false content related to the Amazon (Zap Bolsonaro 2019a, 2019b).

YouTube, meanwhile, presents a rich and accessible source on the spread of mis- and disinformation. Frequently, popular tweets attributing the fires to NGOs, or entirely denying their spread, would point readers towards the same pool of YouTube videos and channels for further explanation, often along partisan or conspiratorial lines. By gathering these videos and visualising the networks of their interrelation – and relation to other major channels – it is possible to identify pathways and actors involved in the transmission of disinformation. In turn, this helps explain the evolution of disinformation from fringe commentators to mainstream political narratives.

The data for our network visualisation was harnessed using the Digital Methods Initiative's "Video Network Module" tool, which uses YouTube's open access "relatedToVideoId" API to map the channels and videos most likely to be recommended to viewers of a given video. By entering the video IDs of aforementioned key videos (primarily identified through Twitter and Reddit) as seeds input to the tool, network files were extracted showing the closest recommendation relations for one or more videos. These networks were then visualised as maps using Gephi. These network maps depict the strength of connection between influencers, news channels, and political figures on YouTube. In short, by visually plotting the channels propagating disinformation surrounding

the Amazon fires – according to the likelihood of their videos being recommended to viewers of specific other channels – we get a glimpse of the mechanisms which drive traffic to these sources. Even with access to the publicly available data used to make these graphs, little of use could be gleaned without visualising the connections between channels, since it is the weight of thousands of connections which highlights statistically significant relations amidst the innumerable less relevant data points and connections. Gephi allows us to see not only the most closely related channels but also chains of shared viewership which might explain the spread of topics and ideas between channels which, at first glance, are less closely connected. In the graph below, dots (or nodes) denote channels – with notable actors highlighted in a larger typeface – while the lines (or edges) between them indicate connections, the strength of which is visualised as the line thickness. The layout of the graph reflects clusters of YouTube channels with common interests or political allegiances. The upper-right cluster around "Leda Nagle" is, for instance, composed of channels primarily producing content related to climate change and skepticism.

The graph above shows the degree of direct audience interplay between channels that construct misinformative narratives (about NGO involvement in the fires and international environmentalist conspiracy) and those of major politicians: the channels of Jair, Carlos, and Eduardo Bolsonaro, and an interview with Ricardo Felicio (uploaded by Leda Nagle) figure prominently. The channels that uploaded videos we had identified as sources of disinformative narratives surrounding the fires have numerous and strong connections (indicated by line thickness and denoting large numbers of shared viewers) to the audience of these politicians on YouTube, and – according to YouTube's API – are highly likely to have their videos recommended to those who watch videos uploaded by the Bolsonaros or Felicio. The related video metric allows "noise" – the swathes of

unrelated or low-impact data – to be trimmed from the eventual graph, increasing legibility of large data sets. Meanwhile, visualising "weight" (the relative likelihood of a video being suggested on another) as line thickness between channels highlights probable pathways for audience migration and can identify other important channels and videos within the same media ecosystem. Tracing links between popular and influential political figures and smaller channels that propagate disinformation narratives not only indicates that official and apparently fringe political commentators are mutually supportive in spreading disinformation to large numbers of viewers, but also suggests ways in which YouTube's own mechanisms drive traffic from mainstream political audiences towards these less popular channels and disinformative content.

The Future of Disinformation Research

Disinformation is information that actively seeks to disinform the public by masking falsehoods, including false connections, as truths. As evidenced here, a variety of investigative research methods can be used to trace the tactics utilised by malicious actors who spread disinformation online. However, these methods are not without limits. In practical terms, open source investigative research requires sifting through large amounts of data. Especially without the use of paid tools that allow access to Twitter's Firehose or use AI for large data crunching, investigative researchers can only collate and analyse a fraction of the available data, which is compounded by the nature of disinformation, which is to mask the information as true. These tools allow for larger data to be processed, but researchers may lose a qualitative closeness to the data, which allowed us in this case to determine which pieces of information were truly disinformation, which actors were particularly influential, and to qualitatively deduce instances where users had sourced content from other online platforms while obscuring the digital footprints that otherwise would allow AI tools to log this connection. Additionally, the tools such as Dataminr often lack transparency about the algorithms behind their platforms, leading to questions about how certain trends or relations between data points were calculated, for example.

In ethical terms, open source intelligence gathering can often be perceived as a form of surveillance, as researchers dive deep into the activities and posts of ordinary citizens, however publicly visible these are. As such, while joining private WhatsApp groups may have allowed this research and that of disinformation research in general to draw better conclusions about the nature of the coordination and networking of individuals spreading disinformation, it would fundamentally change the nature of the research, bringing to light questions of ethics in investigative research. Accordingly, this research did not make use of such methods, as it was deemed inappropriate to falsely portray researchers as pro-Bolsonaro supporters in order to access these private social media spaces.

As disinformation continues to spread online, these considerations will continue to impact future research into disinformation. However, fundamentally, the task of disinformation narratives is to reach as many individuals as possible and to spread the disinformation such that it may become a popularly-believed truth. For that reason, the methodologies outlined in this paper remain salient for future research into the public dissemination of disinformation narratives. By identifying the tactics that disinformation spreaders utilise and the research methods investigative researchers can draw upon to trace and create network maps of individual actors, future researchers may be able not only to track the spread of disinformation, but identify these networks early and stem their spread.

Notes

[1] The Advanced Search function, within Twitter, includes and excludes media from results using Boolean logic (where user queries are mathematically true or false, using AND/OR/NOT operators to allow more specific and complex queries – for instance, searches for posts on Twitter that contain both the word "Amazônia" and "Bolsonaro" but not "Eduardo"). Thoughtful use of this function can allow for fruitful specific searches based on keywords as well as factors including accounts involved, time frame, and number of replies or likes. TweetDeck is an application, independently developed but now acquired by Twitter, that functions on a similar basis but has further options, such as for including and excluding various media types, and allowing for multiple simultaneous searches in a column-view format. Third party sites like foller.me and TweetBeaver can be useful in forming more specific assessments of individual accounts and relationships between them.

[2] Dataminr and Crimson Hexagon rely on AI to navigate far greater volumes of data than free tools or individuals are able, and offer more chronologically significant and more complex searches functions. Both require a fee and we are grateful to Amnesty International for sharing their access. However, these resources ultimately reminded us of the added value of close analysis and limitations of reliance on software alone. When inputting a given hashtag, Dataminr, for instance, provides the option to display which other hashtags were used alongside it most regularly in a specified period – proving beneficial for our understanding of usage patterns and the relative weighting of these different buzzwords. We initially experimented with Crimson Hexagon's influencer and image analysis features in an attempt to identify memes relevant to our research; however, while the programme is not transparent about its criteria for these processes, it is clear that its basis lies in market research. It failed to identify politically significant content (notably, from the Global South in a language other than English, in this case) and we found our own filtering techniques more fruitful. With both tools we held deep concerns around data ethics, and a particular growing wariness about parent companies' collaboration with law enforcement agencies and use of facial recognition technology led us to step back from using the tools. For a more in-depth assessment of these issues and the privatisation of data and data-processing resources, please see Lyndon et al., forthcoming.

[3] The key issues here are in terms of volume and sorting historical data. The aforementioned search functions use Twitter's free-access Search API, while Twitter charges for access to its Firehose API (Application Programming Interface, something most online applications have to allow communication with different apps, servers, and devices). Essentially, the former limits the maximum number of results to 3200, whereas the latter has no such limit and tracks all tweets made since Twitter's 2006 inception. While the former is excellent for close qualitative analysis and specific searches, it lacks options for downloading or aggregating quantitative data – tools that have paid access to the Firehose and allow for the handling of large data sets offer advantages for wider analysis.

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5. Investigating the Far-Right Online: Using Text Data to Understand Online Subcultures

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This contribution provides an introduction for social science researchers on the use of computational methods within investigative research for analysing large text corpora to develop an understanding of online communities and subcultures. It offers a case study of the MineChans project, which utilised such methods in investigating the relationship between the online discussions on a collection of anonymous image-board forums, including 4chan and 8chan, and real-world, offline, attacks by right-wing extremists, making these forums a radicalising milieu. While these analytical techniques are new, they are actually fairly easy for social researchers to implement due to the nature of contemporary high-level programming languages such as Python.

Introduction

It has long since been established within the social sciences that subcultures have their own distinct norms, values, traditions, and even languages that differentiate them from the dominant culture, and that membership of a subculture can influence an individual's behaviour as they adapt their beliefs and attitudes to better match that of a given subculture (Herbert 1998; Haenfler 2013). The exponential increase in both the development and use of the internet and digital technologies during the last 20 years has enabled the emergence of a range of distinctive online subcultures tailored to specific interests. Communication technologies also allow members of such subcultures to communicate anonymously, thus granting them opportunities to engage in behaviours and share subcultural knowledge without the threat of either rejection or detection (Blevins and Holt 2009; Holt and Copes 2010). An online subculture that has made use of these aspects of digital technologies is the contemporary far-right (Baele et al. 2020b), and this has not only resulted in changes to the online-offline interplay of ideas and actions, with Europol noting that "online spaces have been observed to strengthen international links among right-wing extremists" (2020, 68), but has also allowed for the rapid growth and diversification of digital platforms by which these notions can spread; with transnational relationships between content producers (Davey and Ebner 2017) and the livestreaming of attacks by right-wing extremists (RWE) on "grey" chatrooms (Evans 2019b; Baele et al. 2020a, 2020b, 2021; Brace 2021) being just two examples.

Our lack of understanding of the relationship between the behaviour of the far-right online and RWE attacks underlines the importance of developing investigative studies exploring the behavioural dynamics of online subcultures. However, this requires researchers to conduct large-scale, systematic analysis of different aspects of online communities, particularly the nature of their discussions, in order to ascertain how these online interactions can give rise to an online radicalising milieu. The aim of this paper is to show how social researchers can use methods from computer science to analyse large text corpora as part of investigations of that kind. While a number of social researchers already use such methods, this paper aims to demonstrate to those who are unfamiliar with these methods how developing even a basic understanding of a high-level interpretative programming language, specifically Python, can enable them to carry out complex, often cutting-edge, analysis of large text corpora with relative ease. This is a particularly timely consideration, as researchers adapt to deal with "big data," which in the context of social science, often refers to large textual datasets; data that has been extracted from Twitter or YouTube comments, for example. This discussion will be embedded within a case study concerning far-right online extremism, and will demonstrate how social researchers can utilise Python to conduct the kind of research into online communities and subcultures which previously would have been incredibly time consuming and fraught with challenges.

Background

At 13:28 (NZDT) on 15th March 2019, a user posted a message to the 8chan/pol board stating "Well lads, it's time to stop shitposting and time to make a real life effort post" before going on to declare that "I will carry out and [*sic*] attack against the invaders." Moments later, Brenton Tarrant began his attack on two mosques in Christchurch, New Zealand, which resulted in the deaths of 51 people. It is known that Tarrant was the one who made this post to 8chan/pol because it included links to his manifesto and a Facebook live stream of his attack. Tarrant's manifesto itself contained extensive references to the 8chan/pol subculture and its associated in-group/out-group terms and "in-jokes," a clear sign that he had been an active participant on the forum and engaged with its subcultural practices (Evans 2019b; Baele et al. 2020a). Unfortunately, this *modus operandi* of posting a message to 8chan/pol announcing an individual's intentions to carry out an imminent attack and their justification for doing so would be repeated by other individuals responsible for right-wing extremist (RWE) acts of violence. These include the Poway Synagogue (27/04/2019) and El Paso Walmart (03/08/2019) shooters.

There are three aspects of the Christchurch case that demonstrate the way in which digital platforms, such as 8chan/pol, are no longer places of "harmless" and "edgy" online conversations, but instead constitute a radicalising milieu through their subcultural dynamics. First, Tarrant's terrorist activity was inspired by discussions on such platforms. Second, he used this online forum to advertise his ideas and actions. Third, he has subsequently become known as a "hero" or "saint" on these forums and has seemingly inspired others to adopt his *modus operandi* (Baele et al. 2020a).

It was within this context that 8chan acquired notoriety in the public domain and came to the attention of security and law enforcement practitioners. The site itself was one of a family of sites that also include 4chan, 8kun (8chan's direct successor once it was shut down), 16chan, Endchan, Neinchan, etc. These are colloquially referred to as "the chans," and are an ever-changing and expanding group of sites, all of which are anonymous image-boards with a near identical visual layout (Baele et al. 2021). The anonymous aspect of the chans stems from the fact that users of these sites do not have usernames, and any posts they make are therefore anonymous. This is a trait of the forums that users take very seriously, with the hacktivist group known as "Anonymous," which originated on 4chan, drawing its name from it. The image-board aspect of the chans then refers to the way in which the posts made to these sites often contain both text and images, and sometimes only images.

Each chan iteration is made up of multiple boards dedicated to different topics, including video games, movies, cooking, pornography, etc. In the context of RWE, the boards that are of most interest to security and law enforcement practitioners are the /pol (for "politically incorrect") boards. Nearly all chan iterations have their own version of the /pol board, which are ostensibly online forums where users can discuss matters pertaining to society and politics in an environment that they claim is "free from political correctness," but this is little more than a euphemism for racist, misogynistic, and anti-Semitic discussions (Baele et al. 2021; Brace 2021).

The 8chan/pol iteration of these boards grew in popularity following the "#gamergate" controversy when 4chan moderators decided to ban conversations on the subject. This triggered a migration of 4chan users to 8chan, with the latter marketing itself as a "no holds barred" equivalent to the former. This lack of moderation and anonymity on 8chan quickly resulted in its /pol board becoming a hub for RWE (Conway et al. 2019). The 8chan iteration was shut down on 5th August 2019, two days after the El Paso Walmart shooting. However, this was accompanied

by an increase and diversification in the number of new chan iterations coming online, all of which had boards containing RWE content.

The MineChans Project

Some useful insights into the nature of the chan /pol boards and their subculture were gained from both early academic work using qualitative analyses of a small fragment of the boards' content (Trammell 2014; Massanari 2017; Nagle 2017; Ludemann 2018; Merrin 2019) and from investigative research using various open-source intelligence techniques, one example being the specialised news outlet Bellingcat (Evans 2019a, 2019b, 2019c). However, the lack of a large-scale, systematic analysis of the content of these forums left a number of unanswered academic questions that would be of interest to those researching the online far-right; such as what narratives and themes are present in the content of these boards and what is the nature of the relationship between online discussions, the discursive and potentially radicalising milieu that emerges from them, and real-world, offline, attacks?

The MineChans project[1] sought to investigate such questions with the dual aim of advancing our academic understanding of the nature of the online far-right and developing both general theories of radicalisation (Horgan 2014; McCauley and Moskalenko 2017; Kruglanski et al. 2019) and online radicalisation in particular (Conway 2016; Fernandez et al. 2018; Reeve 2019). There was also the intention to use methods that would allow law enforcement and security practitioners to fine-tune their analysis of these forums and tailor their interventions more effectively, in terms of measures such as implementing counter-narratives and shutting down specific sites.

The MineChans team used several computer-assisted analysis techniques to analyse the full text corpus of different chan /pol board iterations. This first involved extracting the full text and image data from 4chan/pol, 8chan/pol, 8kun/pol, 16chan/pol, Infinitychan/bestpol, Endchan/pol, and Neinchan/pol. These specific iterations were selected because, at the time, they had been identified as the most important sites by a range of government and law enforcement units[2] and due to them being the most active in terms of average number of daily posts at the time of data collection.

This data collection process generated a large amount of text data that needed to be analysed if the MineChans team were to understand the posting behaviours and the underlying subculture of these forums. Having to analyse large amounts of text data such as this is a problem that social scientists are increasingly being faced with when investigating online communities, and even more so in the age of "big data"; a term that for those investigating online social phenomena often refers to large amounts of text data obtained from sources such as Twitter. Indeed, the ever-increasing prominence of the internet and digital platforms in our everyday lives offers new possibilities and avenues of research for exploring many contemporary societal issues. While human analysts are able to read such text data and interpret it within specific socio-cultural contexts, the vast amount of data generated by our online behaviours means that social investigators now require new computational methods to analyse such textual data and unearth patterns at the aggregate level (Nguyen et al. 2020). This need has resulted in a boom in the adoption of methods from computer science by social scientists in recent years (O'Connor et al. 2011; Zhang et al. 2020). While it is worth mentioning that small differences between social scientists and computer scientists exist in regards to differences in perspective, these differences do not constitute a disciplinary divide (DiMaggio 2015), and the adoption of these methods by the social sciences has been incredibly successful in terms of productive research, as well as giving rise to the sub-discipline of Computational Social Science (CSS) (Edelmann et al. 2020; Lazer et al. 2020; Nguyen et al. 2020; Zhang et al. 2020).

However, while these advances in CSS have been impressive, there will inevitably be some social scientists who wish to investigate phenomenon such as online subcultures, but who do not (yet) possess the relevant skills to do so. While specialised software exists that allows for analysis of text data, i.e. NVivo and Atlas.ti, most of these options are closed-source, meaning you have to pay for them, and these options often lack the ability and computational power to implement many cutting-edge analytical techniques. In contrast, there are a number of high-level programming languages which have specialised modules that allow for large-scale textual analysis *and* are open-source; meaning they are free to use. Currently, the most popular high-level programming language amongst data scientists and academic researchers is Python, which gets its name from Monty Python's Flying Circus. Python's popularity is due to a number of its features, with the one most pertinent to our discussions here being an emphasis on importing modules. Modules are specific pieces of code that have been developed by users with a specific task in mind. This means that users can often import a module into their code that allows them to carry out specialised operations instead of having to code everything "from the bottom up." An example of a module is the tweepy module, which allows users to quickly develop a web scraper that interacts with the Twitter API[3] to collect Tweets and Twitter user data.

Using Python to Analyse 8chan/pol

Using Python, the MineChans team developed a custom web-scraper that was used to collect visual and textual data from posts, along with each of the posts' metadata (time and date of post, etc.). This custom built scraper used a mixture of Python modules, specifically the [request module](#) and the [BeautifulSoup module](#). Any reader who is interested in seeing how simple it is to construct a web scraper in Python using these modules can download a copy of the scraper used in the work discussed here from the [author's GitHub](#).

This scraper was used to extract the entirety of the 8chan/pol text corpus, from the time that this iteration first came online on 19th April 2017 until it was shut down on 5th August 2019. Data was collected for all original posts and reply posts, resulting in 435,697 total posts being collected, including all the corresponding metadata for each post (key information such as its date and time, etc.).

This 8chan/pol data was then analysed to allow the researchers to construct a "birds-eye view" of the entire text corpus, develop an understanding of the /pol subculture, and to then examine the impact of the Christchurch shooting on the forums' content and pace. What follows is intended to serve as a demonstration of how textual data analysis can aid social researchers in developing an understanding of an online subculture by exploring a forum's content and the dynamics of its online community, and how this can be done with relative ease using computational methods implemented in a high-level programming language such as Python. The interested reader can find the full analysis of this forum in Baele et al. (2020a).

In measuring the popularity of the forum, the number of original posts made per day was used as a proxy measure for how "busy" the forum was. This was done using the metadata of posts, with timestamps being harmonised into the UTC time zone (as this is the time zone used by the forum itself). The researchers then plotted the number of posts across time to show variation during the whole lifespan of the website. Although, the anonymous nature of the forum could mean that a single or small number of individuals making numerous posts per day could have made the forum look more popular than it was, this is the best that could be done given the anonymity of the userbase. However, this simple piece of analysis proved sufficient in allowing the researchers to begin assessing general questions on posting dynamics.

Indeed, as Figure 1 shows, this part of the analysis demonstrated that it took a couple of months for the board to gain traction and start receiving a steady number of posts per day during the summer of 2017, with the pace of the forum increasing to around 30 new original posts per day (not counting replies) after that. The graph shows a significant surge in activity lasting for a couple of days beginning on 27th May 2018, which corresponds to the first major discussion of the far-right "QAnon" conspiracy theory. This is the belief that the world is controlled by a global cabal that is anti-Trump and which operate an international child sex-trafficking ring. While Donald Trump was president, the theory stated that he was planning to dismantle the cabal through a series of simultaneous arrests that QAnon followers refer to as "the storm." This conspiracy theory has been undergoing a transformation since Trump's defeat in the presidential election in November 2020, with the end point of this transformation still to be determined. The two other substantial increases in pace then occur on 15th March 2019, the day of the Christchurch shooting, and a more gradual increase from mid-June to mid-July 2019. This is followed by a drop in original posts shortly before the El Paso Walmart attack in August 2019.

This simple piece of data manipulation and visualisation enabled the MineChans team to demonstrate that not all attacks had the same impact on the forum's pace and dynamics. Indeed, only the Christchurch attack had a clear impact in this regard. It also demonstrated that 8chan/pol's popularity was not significantly affected by the shootings (Baele et al. 2020a).
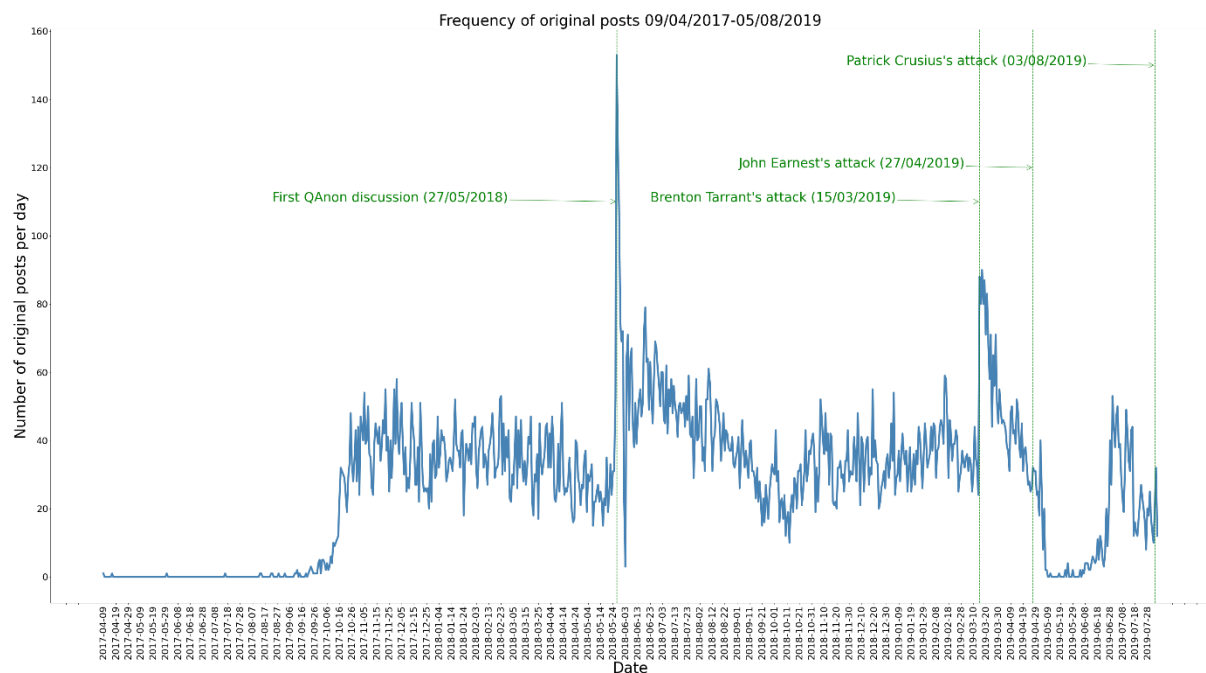

Figure 1: Daily number of original posts made on 8ch.net/pol between 09 April 2017 and 05 August 2019. The green vertical lines indicate dates on which the first QAnon discussion took place and when the RWE attacks that were announced on 8chan/pol occurred, along with the names of the perpetrators. The interested reader can find a full discussion of the behaviour seen here in Baele et al. (2020a).

While Figure 1 provides a measure of the forum's activity, it does not provide an understanding of its content. When working with a large textual data set, such as the one used here, it is useful to develop an overview of the online subculture's ideology, norms, and practices. Fortunately, Python's focus on importable modules makes the implementation of cutting-edge computational analysis techniques, which can help develop such an understanding, easily accessible to researchers.

One such analysis method are the Word2Vec models, as originally formulated by Mikolov et al. (2013). These models are trained on a whole text corpus and produce an *N*-dimensional vector space, whereby each unique word from the text corpus is assigned a distinct vector within this space. The relative positions of these vectors are a product of the contexts in which their corresponding words are used. To put it another way, words that are used in similar contexts are closer together within the vector space than those words that share different contexts of usage. As an example, in a hypothetical corpus and resulting vector space, the vectors for the words "car" and "truck" would be closer together than the vectors for "car" and "apple."

Word2Vec models use artificial neural networks (ANNs), which have gained public attention in recent years due to their use in various projects such as Google Brain and in everyday appliances, such as Amazon's Alexa devices. Essentially, ANNs are intended to mimic the biological process of neurons signalling to one another within a brain.

As Figure 2 depicts, ANNs are made up of nodes, intended to simulate neurons, organised into different layers; the input layer, the hidden layer(s), and output layer. The number of nodes in each layer is largely dictated by the application the ANN is being used for. Each node is connected to other nodes in the "downstream layer," i.e. nodes in the input layer are connected to nodes in the hidden layer. Each node also has a specified threshold value, which is set by the researcher and again has a value that depends on the nature of the project. If the output of a specific node is above its threshold value, it is then activated and sends data to the next layer of the network. If it is not activated, it does not pass on any data. Nodes also have weights assigned to them, which determine how important their signals are, with those that have larger weights contributing more significantly to the output than others. The Word2Vec model uses a shallow network, which are ANNs that have only one or two hidden layers of neurons, like that depicted in Figure 2. In contrast to deep networks, which have many hidden layers. Indeed, this is where the term "deep learning" comes from, with deep learning tasks being those that use deep ANNs.
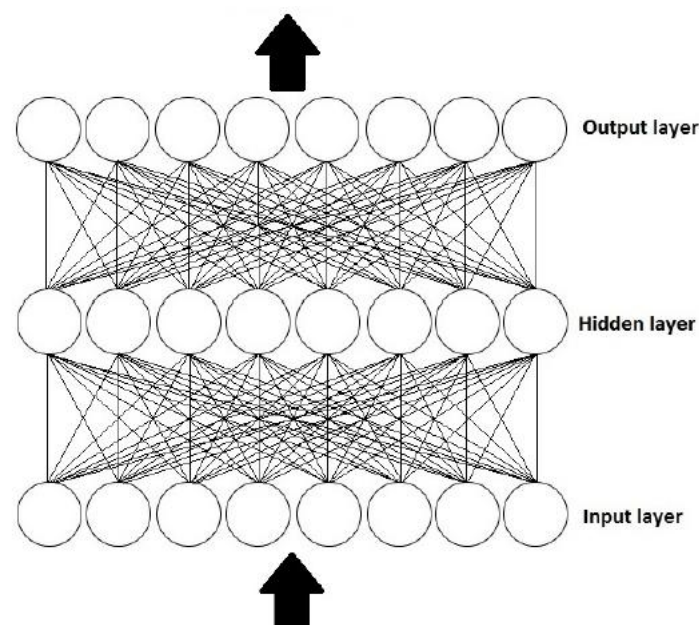
Figure 2: An example of a basic three-layer neural network, where each layer consists of 8 nodes.

Before an ANN is used for whatever application a research project intends, it must first be trained using training data. This involves feeding data into the network, the data being fed through each layer in the network, and the output from the output layer being compared to the initial input data.

The network then uses some form of learning algorithm, the most popular being back propagation (see Rumelhart et al. 1986), to "tune" the nodes in the input weights until the difference between the ANN's output and the initial input data is minimal.

Through such training, ANNs are able to derive patterns and observations from complex data that humans may not be able to, either due to the information within the data appearing to be unrelated or due to the large scale of the data. In the case of textual analysis of online subcultures, the issue is the latter, due to the vast amount of textual data gained from scraping all the posts on sites such as 8chan/pol.

In short, Word2Vec models involve training a shallow neural network on the text corpus, which acts as input training data. However, instead of using the trained network for a specific task, we instead extract the weights from the network's single hidden layer. These extracted weights then constitute the vectors in our N-dimensional space. In other words, these extracted weights are used to determine which words are used in similar contexts based on the text data that the network was trained on.

During training, the MineChan's Word2Vec model[4] was seeded with the most commonly occurring words as dictated by a frequency analysis. The team then asked the model to output the 30 words that were closest in the vector space to each of these seed words. As discussed in Baele et al. (2020a), certain words such as "people," "time," "year," and "thing" were not fed into the model. Such words were not included for one of two reasons. First, because they strongly co-occurred with one of the other, more analytically interesting, terms that were fed in. For example, the words "president" and "trump," which in this case, resulted in the word "trump" being included and "president" excluded. Second, a word was not included if it was a term such as "year" because such terms appeared frequently in the corpus but offer little in terms of analytical value.

While Word2Vec is a powerful analytical tool for working with text data, its multi-dimensional nature provides obvious difficulties in using it to visualise data on a 2D plane, which was its intended usage in Baele et al. (2020a). To ameliorate this, the team utilised the dimensionality reduction technique known as t-Distributed Stochastic Neighbour Embedding (t-SNE), which was originally proposed by van der Maaten and Hinton (2008). In short, this dimensionality reduction method converts high-dimensional data, such as the weights from the hidden layer of our network, into map points for a 2D scatterplot. More specifically, this dimensionality reduction method converts high-dimensional data, $X = \{x_1, x_2 \dots x_n\}$, such as the weights from the hidden layer of our network, into $Y = \{y_1, y_2 \dots y_n\}$, where y_i are map points for a 2D scatterplot. Unlike more traditional, linear, dimensionality reduction techniques that social researchers might be familiar with, such as Principle Components Analysis (PCA), t-SNE utilises a non-linear approach that aims to preserve as much of the high-dimensional data as possible in the resulting low-dimensional map. To achieve this, the algorithm first calculates the corresponding probability of the similarity of the data points in both the high-dimensional and low-dimensional space. This is done by calculating the probability that two points would be neighbours if neighbours were selected in relation to the proportion to their probability density under a Gaussian distribution. The algorithm then tries to minimise the difference between these similarities in higher and lower-dimensional space so as to create an accurate representation in lower-dimensional space.

The output of this whole procedure can be seen in Figure 3, which displays the results of a Word2Vec model implementation of the whole 8chan/pol forum. The output shows thematic clusters that clearly reveal six major components of 8chan/pol's ideology, locating it within the broader "far right" discourse. For example, an orange cluster on the right depicts the predominance of anti-Semitism ("kike," "judaism," "shabbat," "jew," "rothschild," "zionist," etc.).

This cluster is important as "jew" was the third most frequently occurring term of the whole corpus and "jewish" the eleventh. We can also see that the blue cluster consists of terms pertaining to race, with the central grey cluster revealing the importance of discussions revolving around race-oriented movements and action ("identitarian," "organization," "militant," "antifa," "violent," "atomwaffen," etc.), and so on.
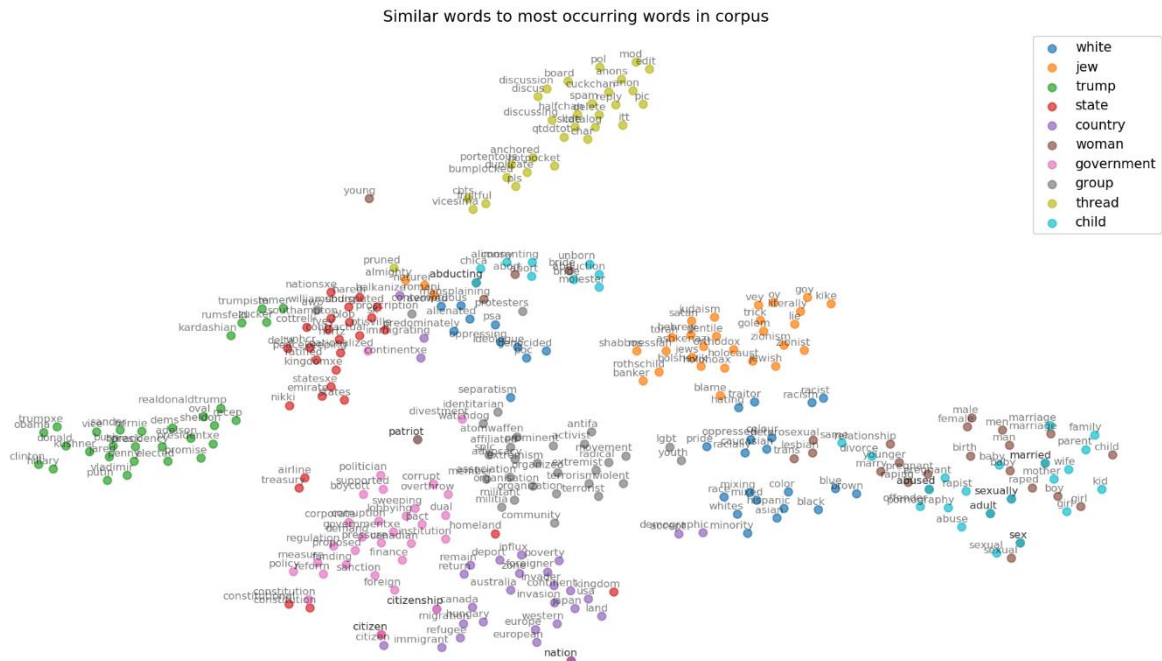

Figure 3: Visualisation of word vectors from the trained Word2Vec model. The legend shows the 10 most frequently occurring words in the 8chan/pol text corpus. The nodes on the graph that match the colour of the words in the legend are then the 30 words that most are most frequently used in the same context as that word.

When studying an online subculture, it is incredibly useful to develop such a "birds-eye view" of the subculture's discussions and ideology as this then enables a more systematic study of specific aspects of the community's online behaviour within the wider context of its overarching ideology. As we have seen, this often entails analysing a large text corpus, which is not realistically possible to do in a systematic manner with traditional social science research methods. However, methods developed in the field of computer science, such Word2Vec models, can be incredibly useful in summarising and visualising a large text corpus in a manner that is easy for a reader to understand. As such, these methods have a clear benefit to investigative social researchers who need to both understand and summarise the themes of a large text corpus.

While the above process may sound quite complex and time consuming to implement, cutting edge computer-assisted analysis techniques, such as Word2Vec models, are easily implemented using a high-level programming language with community developed importable modules. Indeed, Word2Vec models themselves can be easily implemented in Python using either its GenSim or Tensorflow modules, and this is one of the main points that this paper hopes to communicate. The reason why such complex models are easy to implement in Python is twofold. First, packages such as GenSim can be imported into your coding script and contain pre-built implementations of the models that are ready to have data fed into them, in order to train them to produce sensible outputs. All the researcher needs to do is some basic text pre-processing and alter some initial parameters. Second, there is an active online community userbase which enables a researcher to find incredibly helpful tutorials that can take them through the implementation process step-by-

step, and which often includes working code examples. In this way, a researcher can utilise such methods without having to have a prior in-depth knowledge of ANNs or coding.

Summary

As society becomes increasingly digital, social scientists are going to have to utilise new data collection and analysis methodologies that allow for large-scale and systematic analysis of online communities and subcultures. Textual data analysis of the discussions that make up such online subcultures allow for this. As we have seen, computer-assisted methods, such as Word2Vec models, enable researchers to develop an overarching view of a community's discussions, which allow for a macro-level understanding of its ideology, norms, and values. The MineChans team often coupled this macro-level understanding with an in-depth qualitative analysis of a stratified sample of threads so as to develop an understanding of the various claims, concepts, ideas, and narratives seen across discussions within the wider context of the over-arching ideology of the subculture.

This combination of methods has not only allowed the researchers to explore the chans online subculture, but to also develop an understanding of the broader far-right online ecosystem; a term that refers to the far-right's presence on all digital platforms, including traditional websites, online forums, and dedicated communication platforms such as Telegram (see Baele et al. 2020; Brace 2021). This has resulted in the work done for the MineChans project being expanded into the ExID project, an international and multi-institutional project that utilises artificial intelligence methods in order to study the broader far-right online ecosystem. This form of analysis has also allowed members of the research team to provide unique insights into the nature of various extremist online communities to numerous law enforcement, security, and legal practitioners. These included highlighting how this online subculture provided clear in-group/out-group and crisis-solution narratives, both of which are present in almost all extremist ideologies (Berger 2018a, 2018b).

The key point that this paper has sought to make, however, is that these computational methods offer social scientists a lot in terms of new analytical capabilities, particularly in the digital age, and that they are therefore worth exploring. This is especially true for researchers looking at online communities. Furthermore, the nature of high-level programming languages, such as Python and its accompanying importable modules, mean that the implementation of these methods is now much easier for researchers with relatively limited knowledge of computer coding than they once were.

Funding

Useful Resources

Social researchers are likely to benefit from the fact that Python is currently one of the most popular languages used by social data scientists. This means that there is a vast collection of free, open-source, tutorials available to those wanting to learn Python. Two examples of this are the "30 Days of Python" course by the GitHub user Asabeneh and the Python materials available here, maintained by the Q-Step Centre at the University of Exeter, UK. An incredibly useful

tutorial on how to implement a Word2Vec model using Python's GenSim package can also be found here.

Notes

[1] For more information on the MineChans project go to this web page.
[2] Unfortunately, the source of this information cannot be disclosed.
[3] Details about the Twitter API can be found here.
[4] There are different "flavours" of Word2Vec models, with the MineChans project using the skip-gram version. Unfortunately, there is not space here to discuss the subtle differences in these family of models. The interested reader is advise to visit this link, which gives a good overview of the different implementations.

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6. The Digital Panopticon: Contemporary Investigative Methods in Historical Research

Barry Godfrey (University of Liverpool)

In this contribution, Godfrey highlights the importance of the digital revolution in expanding access to historical documents. Through projects such as the Digital Panopticon, digitisation has not only aided academic research but also enabled citizen investigation. Using a number of life history examples, the author illustrates the value of data democratisation, but also warns of issues that arise when autobiographies contradict official records. Godfrey ends by noting that, whilst invaluable – particularly given the closure of physical archives during the pandemic – digital archives should be an addition, not a substitute, for archival study.

The archiving of records is an essential part of a liberal democracy but the part it plays is changing with digitisation, as this paper will show, a development which opens up room for historical investigations of many different kinds and alters the investigator's relationship with the archive as well as the methods we can use to interrogate archival materials. Making the records of the institutions that are funded through taxation publicly available (including those institutions through which government is achieved and maintained) facilitates processes of accountability. As new documents are released after a period of closure, there are often media and academic articles revealing what had previously been recorded purely for the purposes of the original compilers. However, few members of the public in the past were able to negotiate access to the records. Public knowledge deriving from historic records has hitherto been heavily mediated and reproduced through an academic lens. Citizen investigation has been limited. However, the twenty-first century has seen a revolution in digital humanities, with the digitisation of large collections of data previously available only in hard copy to people who visited local or national repositories and archives in person. No doubt the original intention of digitisers was to serve a limited group of people – bringing the archive to academics, researchers, and undergraduates so that they would not consume space and the archivist's time with their enquiries. However, the digital revolution has produced data which is now accessible to a new audience. People who would never have previously secured access (not always easy even with the right credentials) to local and national archives – genealogists, family historians, school students, people for whom the archives are not physically accessible, people from non-academic backgrounds, and so on – can now pursue their own investigations. The knowledge they piece together into stories or personal studies will not end up in university libraries, and most likely will not be published at all, but is instead relayed to friends, family, and local studies groups, providing a wealth of information that is personal and important to thousands of people who would not normally access academic research. The democratisation of data, it can readily be argued, is a continuation of the "History from Below" movement, with feedback loops linking the work of academics and wider bodies and publics, each providing materials for the others to make use of in their investigations and vice versa.

In terms of that movement, the publication of Albion's Fatal Tree in 1975, inspired by Thompson's magisterial Making of the English Working Class published ten years previously, marked the start of a huge growth in the number of historians exploring the impact of legal changes on the lives of the working classes. This school of history saw the law as being the tool whereby countryside agricultural labourers and then, later, the industrial proletariat, were forced into new work disciplines and wage-slavery. They drew upon archived legal and criminal records in order to prove their theories, but the focus on archived bureaucracy was accelerated by Foucault's Discipline and Punish: The Origin of the Prison, published in the same year as Albion's Fatal Tree. Foucault focuses on the technologies of power that allowed groups to temporarily control new disciplines within penal institutional forms; technologies that were not subject to the control of

the traditional elites in society, but were instead utilised by the middle classes, the bureaucrats, and the civil servants. Although Foucault was notably light on archival study himself, he did direct the attention of future crime historians to criminal justice records (Godfrey and Lawrence 2014; Emsley 2018).

Without doubt, the latest generation of crime historians have benefited from the digital revolution. A large amount of data on criminals, prisoners, paupers, workhouse inhabitants, and victims of crime, resides behind genealogical companies' paywalls. In 2014, Ancestry had over sixteen billion historical records available to their two million customers worldwide. Historical prison registers, court documents and police records are added on an almost monthly basis. There is a concentration of data generated in the nineteenth century. Early modern data is fragmentary and slight, a lot of twentieth century data cannot yet be accessed because of archival guidelines (the 100-year closure rule), but the nineteenth century is rich. The period which experienced the Victorian compulsion to document, to record, to catalogue, and to bureaucratise also saw a vast expansion in the institutions of criminal justice. Together this created a record of criminal justice, the people who experienced it, and details of regimes and practices, which is expansive. This data extends not just to the UK, but, due to standardised practices which extended across the British Empire, results in a global basis for studying histories of crime and punishment – there are, for example, significant digital records for the Australian convict system – although the case for "completeness" should not be overstated. The online collections are largely un-curated and there are gaps (driven by the pursuit of collections that are name-rich datasets for the genealogical market); and there is still an over-representation of the "Global North."

In an attempt to further democratise data and to pull back data from beyond the paywalls, the Research Councils have funded major digital humanities projects. Constructed in 2000, the Old Bailey Online contains details of nearly two hundred thousand criminal trials carried out at London's Central Criminal Court between 1674 and 1913. Over a million defendants, victims, and witnesses can be found online, and searches can be carried out to identify specific offences, or particular punishments. From 2017, the Old Bailey data has been connected to a raft of civil and criminal datasets (some existing and some newly digitised) in the [Digital Panopticon](#), which brings together biographical and court-generated data on over 90,000 people prosecuted at the Old Bailey. Data in the Digital Panopticon includes the offending record, including types of punishment imposed, and for many people the convict transportation and prison registers record much which went beyond mere "offence" and "sentence" information. For example, prison inmate documents record biometric and personal details, including "height," "weight," "hair" and "eye" colour, "distinguishing markings" and "education levels." Other records include a kaleidoscope of detailed personal information, from name and address details of victims and next of kin to copies of letters and, after the 1850s, photographs of the prisoner. These data have been juxtaposed with the nineteenth century census records, and also the registers of births, marriages and deaths. Together they provide cradle to grave data for many thousands of normal people caught up in the criminal justice system.

The datasets are linked at nominal level, so that, when a person's name is entered in the site's search engine, an algorithm brings forth data on all people with that name. The viewer can then choose which of the possible options is the person they are looking for (usually this is arrived at by looking at the dates of birth, date of the procedure in court, place of birth and so on) and the data on the selected person is then displayed in chronological sequence, for example, below is an extract of Edward Vidler's life history:

Before digitalisation projects like Old Bailey Online and Digital Panopticon, assembling data with this detail would have been a pain-staking business requiring many hours sifting through archival documents, hoping that every required document ordered was in physically good enough state to be allowed for public use, or otherwise being resolved to scrolling through microfiche and rolls of microfilms. Digitisation has made the search for a convict ancestor much quicker and easier, and additionally the Digital Panopticon has organised the data in a way which makes it relatively simple to storify the chronological data and to produce impressionistic vignettes. Edward Vidler's life was given as an example on the website (below is an extract):

"Edward Vidler was born on 30th August 1820 close to Newgate Prison, an institution that would one day be his temporary home. Edward's parents, John and Rachel Mary Vidler, were coal merchants in London and Edward acted as clerk for their business activities. In the prison records he is described as being able to read and write well, and as 'very intelligent', suggesting he enjoyed some level of formal education. In his early 20s, Edward moved out of home and into the city mile of London. He prospered, until he fell foul of business practices, and found himself prosecuted for fraud in 1848. Edward's Old Bailey trial transcript is brief. However, because Edward was convicted of a substantial fraud, forging a document ordering £350 of goods, this ensured a hefty sentence. He was sentenced to penal servitude for ten years in June 1848. He was deposited in the hulk, Defence, moored in the River Thames. Like many others sentenced in the 1850s, although sentenced to be transported to Australia, he never actually embarked on the journey. He served his sentence entirely on the hulks, until released on one of the first tickets-of-leaves issued in the United Kingdom in 1853. Edward had almost half of his sentence remitted, nearly five years, with the condition that he did not consort with thieves and prostitutes, and, of course, did not commit any further offences. However, Edward did not stay out of trouble for long. Within six months of his release he committed a similar offence to his 1848 conviction. On 12th June 1854 he was again indicted at the Old Bailey and convicted of forging a cheque purporting to have been legitimately signed by Lieutenant Colonel Jebb of the Royal Engineers. He received another decade of penal

servitude as punishment, as well as being liable to finish serving his original sentence. It appears that Edward wanted to be transported to Van Diemen's Land. He pleaded with the magistrate who committed him to the Old Bailey from Mansion House Sessions House that, this time, he should be sent their [*sic*] straight away rather than spending more time on the hulks, stating 'I wish you would commit me at once for trial. I wish to go abroad as soon as possible'. Edward Vidler never did make it to Australia. He did not even make it to a hulk. He died very shortly after being sentenced, aged 34, and was buried in Westminster in the autumn of 1854. We do not know why he died, although his 1848 prison records say he was already then suffering from a 'debility'. It is possible he was already prone to illness, and that five years on the hulks, and imprisonment, saw him further deteriorate."

Edward Vidler endured his penal servitude on British soil but could easily have become one of the 168,000 who were transported to Australia. Mark Jeffrey was one such man, whose life history is also recorded in the Digital Panopticon.

Photograph of Mark Jeffrey, from the Digital Panopticon website:
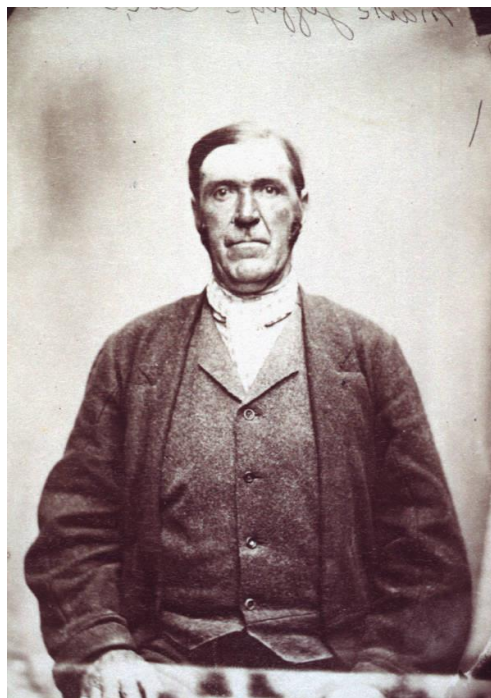
Mark was born in 1825 in Newmarket and grew up with a violent and drunken father. Mark and his brother ran away from home aged fifteen and worked at fairs around Cambridgeshire. He became a relatively successful prize-fighter and put his fighting skills to good use in several altercations with his mother's new partner before fleeing to join a group of burglars operating in and around London. Mark was convicted of burglary and sentenced to convict transportation. Mark, his brother and co-defendants, were all sent to Millbank prison to await an available ship. Whilst at Millbank Mark contracted cholera, which barred him from joining the same ship to Australia that his brother sailed on. Awaiting another ship on the "Warrior" hulk at Woolwich, Mark complained constantly about the amount and quality of the food he was given. He fought constantly with other inmates and when he became enraged at the poor rations, he hit the guard who was doling out the rations with a piece of wood. He was charged with wounding and conveyed to Newgate prison (assaulting two more guards en route) to await trial at the Old Bailey. There he was sentenced to fifteen years transportation, sailing on the Eliza in 1849.

On Norfolk Island he was first employed as a gardener, then a police constable, until his misdemeanours reduced him to labouring on work parties until the Norfolk Island facility was closed and he was transferred to Port Arthur, the prison for repeat offenders in Van Diemen's Land (now Tasmania).

Mark was subsequently released on a ticket-of-leave (a form of conditional release) but not for long. In 1856 as he was returning home after a night's drinking, and after a series of rows with local people, he "playfully" slapped a police magistrate. His ticket-of-leave was revoked, and he was returned to Port Arthur. The Governor of Port Arthur considered that Mark's time would be best spent helping constables in the northern part of Port Arthur territory. For a time, Mark got on well, selling snared kangaroos to locals in partnership with the constables. He was again conditionally released. Over the next decades, although the convict era had come to an end, Mark was found guilty of assaults throughout Tasmania and returned to gaol many times. In 1871 he fought a man in a pub who had insulted him, culminating in the man's death, and Mark's conviction for manslaughter. He was sentenced to life in prison and returned for a third time to Port Arthur.

In order to keep him away from other prisoners, Mark was sent to work as the gravedigger on Port Arthur's "Island of the Dead" where dead convicts were laid to rest. On the Island, Mark claimed to suffer from nightmares, and his health, both mental and physical, was poor. As a result, he was released into the care of Launceston Invalid Station. Rather surprisingly he was a popular patient, and in the 1890s he became the General Controller of the Station. In 1893 he fell into ill-health again; he finally died in 1903 aged 68. The information on his life was written into the criminal and convict records and found in Digital Panopticon, and also in his autobiography which he completed a few years before he died.

The existence of the autobiography greatly added contextual detail to Mark's biography. The descriptions of his life's events obviously range much more widely than the details held in official records. Online newspaper reports of Mark's trials and offences also added detail that was not present in the official court and prison reports that informed the Digital Panopticon outline of Mark's life. Some projects, such as the [Prosecution Project](#) link trial reports directly to an online newspaper report, Digital Panopticon merely provides the data needed (name of defendant, date and place of trial) for a researcher to find a relevant online newspaper report. Autobiographies are extremely rare compared to newspaper reports of offenders and their contact with the criminal justice system, but the availability of all non-official sources raises issues about the accurate recording of a person's life history. Many, perhaps most, researchers have an additive approach. They populate the life history with details wherever they are found – the trial date, offence details, and outcome from official records, with the name of the victim added from a newspaper, some details of the pub, town, city, etc. where the offence took place added in from local history records or books written by historians. The data is not hierarchically ranked where it does not overlap, one does not automatically take precedence over another, but what happens when there is contradictory data? Historians rightly treat autobiographies with some scepticism, and where Mark's story contradicts the official record (the reasons why he would portray events in the way he does is of course very interesting and revealing in and of itself), it is likely that the official record is more accurate. That is not to say that the official record should always "trump" unofficial data, not at all. However, Mark's account of himself and his activities contradict numerous other sources (newspapers, court and other records) in a way that suggest he is presenting a very sympathetic portrait of himself. In other records, the meaning and reason as to why data is missing, or is contradictory, is less clear.

This problem commonly arises with regard to census records. The official criminal justice records may record a different date of birth from census records – indeed it is not unusual for different decile censuses to record different dates and places of birth for the same person. One person, presumably born whilst his father was on overseas military duty, had his place of birth (a town now in modern Pakistan) spelt three different ways in the 1850, 1860, and 1870 censuses, before it is recorded as "York" in 1880 as he had either become fed up of trying to spell it out once again for the census enumerator, or had decided that he now identified as Yorkshire-born in order to "fit in," or simply because he had a different sense of belonging.

When there is contradictory data, some report "fuzzy data" where, say, the date of birth is recorded as 1838-1840, or c.1839. Others will determine which they see as the most reliable source and ignore contradictory data. Both approaches have their benefits and disadvantages. The key is to make known which approach has been taken. It may be that it is impossible to determine the date of birth – in an age of widespread illiteracy many people did not know their year of birth and rounded up or down to the nearest "0" or "5." This results in age-heaping in historical big data, where there is an over recording of people aged 20, 25, 30, 35, 40 and so on. Of course, this is only possible to see when lots of [lives (and data) is made comparable](#).

Both Edward and Mark's experiences of the criminal justice system can be compared with others by using visualisation tools on the Digital Panopticon site, together with the series of explanatory webpages which explain how the criminal justice system worked, types of contemporary punishment imposed, prevailing socio-economic conditions in the eighteenth and nineteenth centuries, and so on. These all help to put specific cases into a general context, and also fulfil an educational objective (for example the explanatory pages are well-used by school and university students). They have also been used by programme makers, artists, and digital forensic archaeologists, to develop theatre productions, taking data well beyond its usual boundaries, and using it in ways never imagined by the original collaborators in the Digital Panopticon project. In terms of academic investigation, the Digital Panopticon team of academics from the Universities of Liverpool, Oxford, Sheffield, Sussex, and Tasmania have produced over a hundred publications using this chronological life history data on the epistemological foundations of the data; intergenerational health and social inequalities; digital dark tourism, recidivism and the "effectiveness" of punishment.

The 1853 Penal Servitude Act created a natural experiment when thousands of men like Vidler and Jeffrey could either serve their sentence of penal servitude in Britain or in Australia. Between 1853 and 1868, both in theory and in law, any man convicted of an indictable offence could expect to either set sail for the southern hemisphere, or to spend years in confinement behind British prison walls – a unique moment in the penal landscape when no man in the dock would know where they would serve out their sentence, and an opportunity to use the data contained in the Digital Panopticon to compare the lives and experiences of similar men who were convicted of similar offences but who had received vastly different punishments. Researchers have uncovered startling success stories for individual Australian convicts who made relationships, money, and a good life in their new homeland (Hasluck 1959; Erickson 1983; Maxwell-Stewart and Hood 2001; Hyland 2004). There are, however, very few success stories for British convicts. Australia's foundational myth insists that, once convicts had left behind class-bound and declining "Old England," the "Lucky Country" rewarded their energy and ingenuity with bountiful natural resources, a "clean slate," and a second chance. British narratives of imprisonment, however, seemed to portray a country that was "stuck with" a growing convict population who made no contribution to the economy (rather the convict estate was seen as a significant drain on the Treasury) and whose recidivism was a constant public and media concern. This has not been challenged by historians or criminologists. Little attempt has been made to use prosopographical

methods to analyse groups of convicts and prisoners or to examine how their lives unfolded over time (Godfrey 2011, 2015).

Prosopography has a long history, having begun as a way of studying the connections and networks between elites in the Classical world. It then developed into a technique of comparing groups of people, again usually elites (doctors, scientists, lawyers, and other professionals). Of late, it has been used to examine the lives of the poor. For example, Godfrey et al. (2007, 2010, 2017) examined groups of young and adult convicted men and women in the UK. After constructing life histories of between 300 to 600 people, data was transcribed into a database. Communalities of experience and coincidences were then explored. For example, it was possible to examine general patterns of desistance from crime by analysing the coincidence of structural factors operating at individual level (marriage/relationship formation, employment, birth of children) and subsequent offending/desistance from offending (see Farrall, Godfrey, and Cox 2009).

Whilst Godfrey et al. only analysed a few hundreds of people (and that consumed a great deal of resource, taking over two years in total), resources such as The Digital Panopticon allow a new method, what might be termed "Aggregated Prosopography" or "Big Data Prosopography" or some such, to emerge. This method looks for patterns and coincidence across not hundreds but thousands of people, in an attempt to provide rigorous analysis using quantifiable data resulting in significant statistical data. For example, by aggregating the thousands of individual life-histories in the Digital Panopticon, Godfrey (2019) was for the first time able to answer a long-established historical question (one that Jeremy Bentham originally posed in the eighteenth century), [which was more effective, imprisonment or convict transportation?](#)

Using Digital Panopticon data to compare rates of reoffending amongst Australian and British convicts it became evident that both sets of incarcerated men continued to appear in the courts for both petty and serious offences following their initial punishment. Australian convicts had lower reconviction rates, and were slower to be reconvicted than British convicts, but Godfrey (2019) found that the statistics for both systems are damning. Neither the Australian nor the British convict systems were effective. Neither system achieved one of their main aims of significantly curbing re-offending. Many people who went through "the system" (in the UK and in Australia) were reconvicted. Alongside our analysis of the different rates of reoffending in each system of punishment, we should first note their remarkable efficiency in manufacturing such high rates of recidivism. It would have been impossible to make this assessment without the data contained in the Digital Panopticon, or indeed to answer a range of other important historical questions. As Godfrey stated in 2016:

"Online digitized data has the power to transform crime historical research – liquefying historical research. The scale of digital data, and the speed with which it can be accessed, have engendered new forms of crime history which have the capacity to shift the theory and practice of history with a rapidity hitherto not encountered. Whereas traditional forms of historical enquiry use data for academic research, liquid crime history is also very much concerned with the production of data for the general public. This democratization of data allows all viewers to interpret the data for themselves and re-interpret what the academic experts have posited."

In servicing the need for non-hierarchical citizen investigation, the Digital Panopticon and other digital data projects are particularly important in correcting imbalances in the preservation and availability of data. Recently the Department of Archives and History for Alabama [published a letter apologising for past policies](#) which hid and destroyed records of African American citizens. The surviving records in Alabama, and other US states, contain vast amounts of data about prisoners (the majority of whom were formerly enslaved people and their descendants; see [this](#)

article). The data has the power to unlock the lives of some of the poorest and most disadvantaged people, and to power academic and genealogical research. The data could help to quench a thirst for thousands of people who want to know more about their recent ancestors' lives, their experiences and their struggles – and, not least, show how they recovered from disadvantage to rebuild their lives. Schoolchildren, undergraduates, descendants of formerly enslaved people, and historians of all kinds would be able to access data which was never meant to be seen by them, but which is an important part of their individual and collective history. However, the data is still held behind a paywall, and is therefore not fully available to all. Public funding for large digital projects will help to democratise data such as this for all communities, and for all types of scholars, but only when large-scale funding is made available. Until then, online collections of digital data are likely to reproduce biases already detectable in historical archival collection policies.

Of course, it should be remembered that digital archives are not (or should not be) a substitute for archival study. If you can gain everything you need for your historical study from digital sources, your study may be too limited. Websites should allow some research questions to be answered, and some research questions to be formulated, however, it would be very rare for any website to do both. The temporary closure of archives, local studies departments in libraries, and other repositories, due to coronavirus, together with the longer-term decline in public funding for archival work, means that digital sites are invaluable. However, contextualising the information they find online may still involve a visit to the archives. It is the difference between ordering the book you need from Amazon and finding the book you did not even know you needed from browsing the shelves of the local bookshop.

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7. Petitioning and People Power in Twentieth-Century Britain

Anna Bocking-Welch (University of Liverpool), Richard Huzzey (Durham University), Cristina Leston-Bandeira (University of Leeds), Henry Miller (Durham University)

In their contribution, Bocking-Welch, Huzzey, Leston-Bandeira and Miller set out their historico-political approach to the investigation of petitioning as a practice over a one-hundred-year period. In this context, specific petitions or even public discussion of specific petitions provide trace data for exploring the practices which produced them. Rather than a single, stable set of practices, Bocking-Welch, Huzzey, Leston-Bandeira and Miller show those practices are embedded in, shape and are shaped by wider social, cultural and political contexts. By tracing petitioning outwards to these varied contexts, they expand the notion of the political by expanding our understanding of where politics happens and what is involved.

Introduction

What is the point of petitioning? It is a question many UK citizens ask, given the twenty-first-century expansion of e-petitioning, but one that we are pursuing in the twentieth-century history of Britain. Drawing on and drawing out the methodological insights we have gained from prior investigative research in the fields of politics and history (see below), by focusing on a practice – the creation, signature, and reception of petitions – over 100 years, in our current work we are surveying the ideals and practices of political participation, tracing how petitioners, petitions, and the reception of petitions changed with the extension of universal suffrage or the reconfiguration of the state. Many historical or contemporary investigations of politics in this period focus on particular institutions, such as national parties and pressure groups, or specific issues, such as immigration or abortion. Investigating a particular practice over a century of democratic reinvention and social change, by contrast, allows us to investigate the dynamics that have connected and indeed still connect these fields.

Our aim in this paper, and as our contribution to the broad theme of the collection, is to show that by uniting expertise and methodologies from political studies and historical research, it is possible – as we shall discuss in what follows – to employ different kinds of data sources, search strategies, and forms of intellectual collaboration in investigative inquiries to forge new understandings of historical and contemporary practices; here, of the connections between political institutions, social movements, and voluntary action through petitioning. Versatile, cheap, and accessible, petitioning flourished well beyond official, regulated systems for inviting and receiving petitions. Though Parliament or local councils had procedures to receive petitions, many other bodies or individuals might be addressed or confronted with them. As investigators, in this context we feel it is important not only to explore how authorities, such as Parliament and 10 Downing Street, implemented and tweaked centralised systems and rules for formally receiving petitions, but also how campaigns launched petitions 'in the wild', without any invitation or procedure for petitioning. In our research, this involves recovering democratic strategies and beliefs by tracing how and when petitions addressed individuals (from the Prime Minister, to a parliamentarian or local councillor, to a head teacher) or bodies (from the government, to Parliament or a local council, to the BBC or the World Bank). We also consider petitions as evidence of collective action by existing bodies (such as charities, lobbies, parties, or churches) and as the formative activities founding new forms of collaboration. Studying a practice rather than particular organisations or forms of organisation enables us to link together disparate literatures (on NGOs, parties, or churches, for example) with a focus on looser collectives (such as parents,

neighbours, or customers). Our investigative focus is, then, how far petitioning has formed part of a wider repertoire of tactics or proved a gateway to further activism.

The signatures upon petitions embody the practice of politics beyond the realm of elections – since many petitioners, before universal suffrage, did not enjoy the right to vote and many signatures, after it, continued to come from non-citizens and young people. Extensions of the franchise (to women and poorer men after 1918/1928 and to 18-21-year-olds after 1969) structured mass democracy, but petitions identify still wider participation in it. In particular, our research examines how recourse to petitioning from younger Britons and non-citizens of the UK (as defined by 1905, 1948, and 1981 acts) and responses to their mobilisation reveal changing cultural attitudes about youth and race, respectively. The focus on petitioning thus permits investigations of a form of democratic participation and representation for non-voters, glimpsing a wider political public than that on the electoral roll.

The significance of petitioning for petitioners – and, now, researchers – lies beyond an 'objective' or 'instrumental' assessment of immediate results or lack thereof. While our case studies, the details of some of which are discussed in what follows, may highlight particular conditions for petitions to "succeed" in winning a desired response, we are conscious that the "point" of petitioning is subjective, even if reduced to the crudest assessments by many politicians and commentators. Among signatories and addressees petitions variously represented the strength of opinion, shared information, mandated action, or publicly expressed a set of values or duties. Social movements, political parties, and local campaigners used petitions to build affinity with supporters and to mobilise further activism. Newspapers and, eventually, television routinely pictured public opinion through the presentation of signature sheets to a police officer at the door of 10 Downing Street. Some Britons experimented with transnational campaigns to pressure global bodies or foreign governments, while shopkeepers hosted petitions to commute the death sentence for a dangerous dog or to keep Hilda Ogden in Coronation Street.

Just as importantly, as a form of participatory democracy often presenting claims to elected representatives and public bodies, petitioning reveals the practical conflicts and tensions between different forms and conceptions of democracy. By recovering the experiences of those who signed, organised, and received petitions, we gain new insights, for instance, into the blurred experiences of participatory, direct, and representative democracy. That is, petitioning reveals overlapping expectations concerning how modern Britain should practice rule by 'the people', which defy the neat distinctions of political theorists and problematise attempts to allot political action to such seemingly well bounded and mutually exclusive categories. Exploring those blurred lines at different historical moments emphasises how appeals to 'public opinion' and 'people power' are created and manifested in petitions and other forms of representation, rather than reflecting prior, naturalized attitudes. Our work considers when petitions aided the representation of minority voices and when they served to amplify majoritarian community reactions. By investigating the reinventions of an ancient medium over a century, we can therefore capture the ways in which changing contexts reshaped behaviours and attitudes, as well as the political community constituting 'the people'.

Within this we also consider how new media technologies such as photography, newsreel, and television have influenced the visual culture of petitioning, since petitioners may have seen publicity to be as powerful as the force of signature lists. Moreover, the computerised exploitation and, subsequently, regulation of personal data has reshaped older traditions of harvesting information about petitioners from their signatures. Investigating petitioning's modulating historical and political forms casts light on how far web and e-mail petitions in the 1990s replicated or fractured the analogue practices of petitioning honed on trestle tables at street stalls and on

clipboards on neighbouring doorsteps. Gaining an understanding of these practices therefore permits us to evaluate continuity and disjuncture in the technologies of democracy but also to enhance the understanding of signatories, campaigners, and officials who are supporting, launching, or receiving e-petitions today.

Research Context

Our research draws on disciplines and approaches from distinct research contexts. Our team unites expertise in historical research into petitioning as a tool of popular contention in pre-democratic societies; techniques and models analysing e-petitioning systems in political studies and the social sciences; and the evolution of voluntary action, social movements, and democratic cultures in twentieth-century Britain. The project gestated in conversations facilitated by a comparative AHRC Research Network on Petitions and Petitioning from the medieval period to the present, which highlighted questions about the transformations in Great Britain between universal suffrage and the emergence of e-petitioning.

This is an area of research where interdisciplinarity and scope of expertise are key to investigative rigour. Richard Huzzey and Henry Miller bring, for instance, an interest in comparative studies of petitioning before – and, in the proposed project, after – universal suffrage. As they have argued in prior collaborations, historians can use petitions as prisms to understand wider changes in power and society (Miller 2019; Huzzey and Miller 2021). Their previous research on nineteenth-century petitioning to the House of Commons was able to create a long-run dataset, which suggested a declining variety and, eventually, number of petitions after the turn of the twentieth century. The new collaboration tests their hypothesis that this decline reflected the growing devolution of power to local and plural authorities, as well as the centralisation of government control in Downing Street and the whips' office (Huzzey and Miller 2020). Researching the forms of petitioning helps de-centre the ballot box as the crucible of political representation, enabling us to rethink how the relationship between representative institutions and active citizenship is shaped by other channels of participation and communication. 'The politics of association', identified by Helen McCarthy and Pat Thane as a defining feature of mass democracy in twentieth-century Britain, can be explored in new chronologies of voluntary associationism by testing pessimistic interpretations of post-war civil society (McCarthy 2007, McCarthy and Thane 2011). For social scientists seeking to gain a better understanding of pressure groups, our project restores the agency of ordinary citizens, subjects, and signatories to frameworks focused on co-evolution with policy evolutions in the state (Grant 2004).

Our research also historicises the growth and evaluation of e-petitions in the twenty-first century and adapts to historical evidence the methods used by Cristina Leston-Bandeira and other social scientists to study them (Leston-Bandeira 2019). Our terminal date of 2000 saw the launch of digital petitioning by the Scottish Parliament, which revived institutional petition systems in Britain, alongside the remarkable Jubilee 2000 debt campaign and the consolidation of early internet experiments in e-petitioning. When it comes to developments of these kinds, we can draw on qualitative research approaches developed by scholars examining both comparative international and national contexts (Bochel 2020, Linder and Riehm 2012, Wright 2016), but also provide evidence to evaluate the ways in which a digital medium disrupted analogue habits. This is a key question for providers of e-petitions systems today, such as national legislatures and local councils, but also campaigners deploying e-petitions, including NGOs and charities.

For historians of twentieth-century Great Britain, we pursue the overlapping local, national, and international dimensions of politics, culture, and society, as Anna Bocking-Welch has explored in her historical research concerning civic society, globalisation, and decolonisation (Bocking-Welch

2016). The project's investigation of small-scale case studies is valuable for connecting investigations of locality and local government in twentieth-century Britain, hitherto neglected. This is a new approach to the 'politics of place', emphasised by recent political studies, examining the personal and local interface with wider movements and institutions (Lawrence 1998, McCarthy 2007, Readman 2009). That approach allows us to trace British petitioners' engagement with global campaigns, which marked a simultaneous decentralisation of international relations in citizen-to-citizen campaigns and a centralisation of political authority in supranational bodies (Bocking-Welch 2018, Pedersen 2012). Offering a long-term chronology, straddling the traditional fault lines of 1918 and 1945, enables us to offer broad interpretations of changes in democratic culture, political organisation, and social power through case studies of petitions, petitioning, and petitioners.

Research Methods

The diffuse nature of the topic of petitioning requires us to trace larger patterns through a mix of social-science and History methodologies, glimpsing the place of petitioning in a wider community, the subjective experience of an individual, and also the reception in receiving authorities or media coverage. On a practical level, the team use NVIVO Cloud to share and organise notes on multi-media sources across the participating institutions and assist mixed-methods analysis by imposing metadata on unstructured sources. Our code book is not complex, but associates particular evidence with research themes (such as those relating to NHS hospitals or examples of the visual spectacle of presentation), identities or groups (such as petitions signed by children or organised by particular charities), and audiences to whom petitions are directed (such as the BBC or a local council). But what are the sources and methods behind the project?

Thanks to the pandemic, the most accessible set of sources have been the digitised databases of local and national newspapers in twentieth-century Britain. As many historians have noted, these offer unparalleled opportunities to search and identify examples across thousands of pages of newsprint, but require careful use. Legal or commercial considerations may guide the digitized content of databases, with some major national titles preferring to sell access to their archives through separate products. Moreover, the quality of optical character recognition (OCR) for particular publications or styles of newsprint may make some titles or periods less sensitive to full-text searching. Searching across the whole of Great Britain with tools such as the British Newspaper Archive, looking for the term "petition" with specific causes or social groups, may yield disproportionate numbers of results from certain places in certain parts of the century: For the 1990s, roughly 0.4% of people in Great Britain lived in Aberdeen, but 6,209 (19%) of 32,919 digitised issues are local to the city, while the database captures a more proportionate 2799 (2%) of 125,870 editions from the 1950s. In addition to being aware of the chronological-geographical coverage of digitised databases, we are also mindful that the quality of OCR for particular newspapers can distort any search strategies (Huistra and Mellink 2016). Preliminary explorations in the local press formed an important early phase of our research in charting the contours, varieties, and contexts of press coverage that we might explore more methodically, given that we could not inspect all 2.7 million hits (in the British Newspaper Archive alone); yet we are conscious of the vagaries of copyright licensing by publishers in determining what data we are searching for any given year or decade. At the same time, some general searching for specific terms (e.g. "petition + internet" in the 1990s) yielded not just examples of our target material (in this case, early e-petitioning) but also 'false positives' that could be interesting for a different reason: For example, amongst the false hits for these terms, we often discovered interesting paper petitions (such as those for handgun restrictions after the Dunblane massacre) thrown up by an unrelated use of the word "internet" (or an OCR confusion) elsewhere on the digitised page.

Though newspaper reports of national or local petitions provide empirical examples, perhaps for further research using different sources and methods, we are also interested in the media's agency in publicising and encouraging petitioners. This is especially important in cases where newspapers not just reported, but initiated petitions as part of their own campaigns, using pre-printed slips to engage readers and bolster their own representative claims. However, we are also cognisant of the ways that campaigners, including political parties and elected representatives, used petitions to create a visually and materially dramatic 'newsworthiness' to a cause. This, in turn, has helped direct our attention, when investigating other sources, to the place of marches and presentation in creating spectacle: Hence, just as the Jarrow marchers walked to Westminster with their petition against unemployment in 1936, so the wives of fishermen from North Shields carried a petition to Downing Street in 1975 complaining of 'cheap imports of frozen fish'. While we are aware of the journalistic mediation in these reports, they can also yield interesting insights about what activists wished to communicate to the press. Emphasising community solidarity and a focus on dependents, not the fishing industry workers themselves, Mrs. Mary Morse explained that, as chairman of the newly-founded North Shields Fishermen's Wives Association, 'we have all come together because of this dispute but we plan to stick together' (*Newcastle Journal*, 11 Apr. 1975, p. 7; *Newcastle Evening Chronicle*, 10 Apr. 1975, p. 17).

We are able to access some newsreel and television footage of filmed news coverage, examining how it framed or narrated scenes, but also recovering the spatial and material place of petitions in wider repertoires of protest. For example, [Reuters' footage](#) of a 1971 rally against UK membership of the European common market showed the prominence on the rostrum of posters advertising a petition to the Queen for a referendum, as one of the actions attendees could take in support of the speakers. There is also potential to examine the attitudes to petitioning depicted in written or dramatized fiction, with the cultural analysis familiar to literary and film studies. For example, readers and viewers of the comic misadventures of Reginald Iolanthe Perrin must have recognised the stereotype of his upper-middle-class neighbour collecting a thousand signatures against actions 'inconsistent with the character of this predominantly residential area', sending 'photostats' to the council, her MP, and the local newspaper (Nobbs 1978). A memorable scene in the 1981 BBC sitcom ['Yes, Minister'](#), where the secretary of state rejects a petition he started when in opposition, was based on the real-life experience of Home Secretary Frank Soskice, linking popular cynicism about government responsivity to documented evidence of political history (Dyson 2019: 74).

We are also exploiting and assembling existing quantitative data where sources permit meaningful analysis or systematic samples. An obvious challenge is to collate statistics on the numbers of petitions and signatures, compared to earlier periods or other polities. However, the growing attractions of presenting petitions to offices that did not publish records of them, such as 10 Downing Street and Government Departments, or did not compile systematic data, such as local authorities, means that it is often impossible to quantify the numbers of petitions systematically, as might be possible for earlier centuries. Although parliamentary clerks recorded petitions presented to the House of Commons, the abolition of the Petitions Committee in 1974 ended the practice of verifying signature numbers adopted since 1833 (Huzzey and Miller 2019). Moreover, as discussed below, many twentieth-century activists collected signatures for petitions that would never be – and were never intended to be – handed over to an authority, in contrast to the central role today of institutional websites hosting e-petitions systems for signature online (Leston-Bandeira 2019, Bochel 2020). So far as quantitative data exists for the role of petitioners, some later twentieth-century polling, such as the [British Social Attitudes](#) survey, included questions about petitioning, though the format of questions was inconsistent and often flawed, meaning these data are used contextually, with caution. We are also aware of overstatements introduced by social desirability bias in results recalling that 63.3% of Britons had signed a petition in the past five years and 8% that they had organised one (Parry et al., 1992, Persson and Solevid 2014).

Quantitative data on the attitudes of representatives or officials receiving petitions is even scarcer, though one social-science study of public policy in Kensington and Chelsea is a rare example surveyed councillors' (largely negative and hostile) attitudes to petitioners (Dearlove 1973). Statistics and surveys on the reception or signature of petitions represent an important, but incomplete, avenue of inquiry, therefore.

For historians, this absence of evidence and the need to 'read against the grain' of surviving sources compiled for other purposes is a familiar challenge. Work in a variety of personal and institutional archives can yield manuscripts and unpublished print sources which bring out the interior discussions of campaigners and those they petitioned. For example, declassified Security Service files on suspected 'subversives' might record their legal activities as part of petitioning campaigns in the course of reports on the movements and contacts that might yield evidence of illegal actions. Although the pandemic has disrupted this aspect of our research, we have identified material deposited by politicians, activists, and bodies that may reveal the tactics and deliberations of particular organisers. Preliminary research has identified that MPs' constituency casework often contained petitions (or photocopies) not formally addressed to Parliament, constituting an unstructured archive of local activism (though one that requires careful compliance with legal and ethical concerns). Where archives have been digitised, we have been able to find catalogued or searchable materials, such as constituency petitions presented to Winston Churchill or the institutional campaigns of the Anti-Apartheid movement. We are conscious of a chronological imbalance in our access to archival sources, as the UK's thirty-year rule, the closure of records due to GDPR, and the lead time for archivists to catalogue deposits means these sources are richer for earlier parts of our period.

Of course, archival deposits generally privilege the perspective of the originator of the documents, though it is possible to find and use manuscript evidence of private citizens' encounters with petitions. For this reason, the team have also used the digitised Mass Observation Archive for glimpses into respondents' private encounters with petitioning. Though critiqued at its foundation as 'scientifically, about as valuable as a chimpanzee's tea party at the zoo', the Mass Observation project of 1937-50s, revived since 1981, provides 'idiosyncratic historical materials' that mix anonymous respondents' unstructured diaries, questionnaire responses, and collated clippings from the press (Pollen 2013). For example, the Spring 1985 directive asked respondents about their opinions and actions arising from Enoch Powell's bill against embryological research; the data indicates that 4.3% of them signed a petition, while 3.3% wrote a letter to their MP (including 0.8% who did both). Given the self-selection and uncertain sampling of participants, their responses may be more revealing for individual comments appended to the (confusingly-phrased) questions: one woman, possibly interpreting the prompt in relation to abortion, recalled leaving her church in response to pressure to sign a petition circulating amongst the congregation (Mass Observation, Spring 1983 directive, T959).

These intimate, subjective experiences are also accessible through oral history interviews, and we have embarked on re-use of those recorded for previous projects from both petition organisers and the addressees of their petitions. The largest and most accessible collection is available through the British Library [BL] Sound Archive, with summaries capturing the discussion of petitions in such unlikely collections as those pertaining to British restaurants and restauranteurs. More typically, we have used interviews with campaigners, which allow us an insight into the rationalities and subjectivities behind petitioning. For example, Clydeside activist Kay Carmichael recalled travelling to London to present an anti-nuclear petition to the Conservative Defence Secretary in 1994, who refused to meet them:

We knew perfectly well it wouldn't help but it's very important to keep on trying, and to make requests even if they're going to be rejected. But we didn't expect quite such a brutal rejection– we thought we'd at least have courtesy. And we didn't even get that. I mean, obviously we didn't expect [Conservative Defence Secretary] Malcolm Rifkind to suddenly whip away all the nuclear weapons. But it was important for us to make the statement about going. (Kay Carmichael interview, track 10, 08:50-10:28, C1155/12, National Life Stories, British Library)

Her reflections on the subjective experience, rather than instrumental 'success', of petitioning point to factors often missing from rational-choice studies of political participation. Her anger was roused by the snub, and perhaps consequent lack of publicity for her 'statement', in receiving the petition; she acknowledges that the minister's (and government's) view was settled, so persuasion of the addressee was not the principle aim but rather a means of publicising concerns to others or realising self-expectations of duty. Indeed, this provides evidence of 'the psychic and internalized costs that some people bear when they fail to take part in a protest' identified by political theorists as a solution to the 'costly participation' dilemma for elections and activism (Aytaç and Stokes 2019: 82). Since we are using these interviews to understand the meanings of experiences and recollections to the subjects, often revealed in intonation of the voice as well as the words spoken, their value is not compromised but found in their subjectivities, though we are alive to the post-hoc reconfigurations that mould recollections. Where an element of performance is involved, we can at least examine how an interviewee wished to frame their actions and motives (Summerfield 2019). Re-use of existing oral histories, recorded for very different projects, present challenges; whilst questioners may have ignored the detailed follow-ups that we might dream of asking, the very circumstances also mean that we can consider how interviewees thought or talked about petitioning when not invited to contribute to a project examining it and so avoid reifying it as something of mention (Gallwey 2013, Sutcliffe-Braithwaite 2016).

Besides our re-use of existing recordings, the project has also committed to creating our own through partnerships with National Life Stories, a charitable trust within the British Library's Oral History section. While the pandemic has required us to adapt to remote interviewing, we have begun to gather testimony from those organising and receiving petitions, which both inform our research and constitute a resource for future study of twentieth-century activism. Our research team completed joint training from the Oral History Society, given it is for us all a new methodology or a departure from past use of research interview methods favoured in the social sciences. For those familiar with background interviews for empirical political studies, the 'life story' approach to oral history differs in preferring open, biographical questions, guided with prompts such as 'can I take you back to when…', with follow-ups recommended to probe 'why did you think that?' or 'how did that make you feel?'. In fact, some of our subjects were veteran interviewees for political studies and also found it surprising to be asked more personal questions. While we would always wish to avoid leading interviewees or 'feeding' our hypotheses for them to verify, the 'life story' approach can create tensions with the focused, specific questions the project might wish to answer about petitioning in particular. However, we have embraced this as a possible benefit, since we wish to consider petitioning in the broadest possible context, alive to the fact that it was rarely the only or primary means exploited by any given campaign. By seeing how and when it relates to a wider career or experience, we may mitigate the eternal peril of over-stating the influence, exceptionality, or significance of the topic of intense study. This is a particular peril for historians, used to considering the context and representative merits of qualitative evidence, now creating and commissioning their own primary sources to answer their research questions directly. In identifying our interviewees, we focused both on officials and representatives of local government (poorly represented in existing collections) and campaigners (relatively well represented for larger organisations, but not community groups). While this could rely on existing

contacts, through the Study of Parliament Group that brings together parliamentary officials and academics, for example, it also relied on direct requests to people identified through our research in newspaper and archival sources.

A second partnership, with the History of Parliament Trust's Oral History Project, combines both re-use of existing material and the commission of additional recordings. This initiative, founded in 2011 in association with the BL Sound Archive, has completed more than 160 interviews with former MPs. An early phase of our project was to scour the deposited tracks and summaries for discussion of petitions; we were not surprised to find them mentioned relatively rarely, since the interviewees and interviewers – in answers, questions, and the summarised highlights – focused more on the topics and themes (such as women's rights, nuclear arms, or the poll tax) than particular campaign techniques. However, where possible for interviewees and interviewers (or a replacement interviewer), our partners at the History of Parliament have returned to record follow-up conversations with ex-MPs, asking questions about electioneering and campaigning, concluding with specific questions about the use of petitions they have started or received. Similar material can also be glimpsed from political memoirs, where parliamentarians or representatives may discuss their attitude to petitions – which was often sceptical of their organic popularity and dismissive of their effectiveness.

In some cases, our methods follow familiar ethical and legal guidelines. Where quantitative data or Mass Observation responses are anonymised, we do not risk sharing personal data on living people. When creating and commissioning oral history interviews, or using those conducted under guidance of the BL, we can follow best practice for participation and deposit agreements, making clear that interviewees can withdraw at any point up until archival deposit and that they may choose to close the recording or pseudo-anonymise our use of it. However, we are mindful that historical social-science studies rarely secured agreement to re-use of data, and we are conscious of the need to anonymise living (or potentially living) individuals where there is no justification for naming them (Sutcliffe-Braithwaite 2016). While many archives offer access to post-1920s materials subject to agreement to follow UK Data Protection Act 2018 (GDPR) restrictions, we are also likely to come across the names of individual citizens featured in published or broadcast media reports. Though not public figures in their own right, they may have been quoted as supporters of petitions on matters concerning sensitive topics, such as politics, religion, sexuality, race, or trade union membership, where there is no research need to publicise their names decades later. So, the team has a clear protocol to discuss whether and when to name individuals who have not signed a research participation agreement with our project, with a presumption against in the case of signatories to petitions rather than spokespeople for them.

The project, then, combines a wide variety of source types, each raising different methodological concerns. Taken together, a cynic might judge this to be magpie empiricism – collecting a wide variety of evidence and then analysing what exactly it adds up to – even if we remain careful of the perils and prejudices of different sources. However, we believe that the strength of historical research and mixed-methods research more generally lies precisely in the opportunities to combine and compare these different bodies of evidence. By cross-referencing themes and patterns between different sources, we can address the lacunae and frailties of each. So, for example, we will ideally identify an individual campaigner from a newspaper or TV news report; if they are alive, we will approach them for interview; if relevant authorities, receiving their petition, are alive, we can ask them too; we can explore institutional archives for the petitioner and the petitioned. This ideal type of case study will rarely be possible: For instance, episodes in the earlier twentieth century are likelier to yield access to deposited private or confidential archives, but are certain to test the longevity and vitality of the most healthy oral history interviewee – whilst in the later decades the inverse is true.

Whether working with catalogued archives, digitised OCR-searchable databases, or our own oral history interviews, we are conscious of the fact that our topic – the activity of petitioning – was usually subsumed as a practical detail in the subjects, concerns, and experiences that structured catalogues and dominated recollections. In the first instance, this means our discovery of evidence and sources is often dependent on the use of the word 'petition' (or its derivatives) by contemporaries or those cataloguing or summarising materials for researchers to discover. The methodological problems of digital search strategies – in databases or catalogues – only refresh the old dilemmas of discerning where relevant material might be found and when its rarity is due to accidents of survival rather than indications of typicality. Bocking-Welch, who was familiar with the Oxfam archive at the Bodleian Library from her previous research, warned the team of its unusual scale, organisation, and reach, compared to other NGOs or charities who may have deposited more haphazard records of their activities. Historical researchers owe deep debts of gratitude to archivists whose catalogue descriptions generate unanticipated "discoveries", but also an awareness of how such practices shape their "fishing" in collections (Dunley and Pugh, 2021). Where the summary of an oral history interview or the description of an archival folder uses a synonym ("pledge", "protest", "campaign") or refers to activism on a particular issue ("unemployment", "milk prices", "Cambodia"), we are less likely to catch it. A question then arises, as to whether our discoveries are typical – the visible tips of submerged icebergs – or reflective of the organisational capacity of groups to mount petitioning campaigns and organise their own records. Though attracted to case studies with a rich mix of available sources, we have deliberately used them comparatively with a wider body of evidence. This requires us to consider where petitioning accompanied far higher-profile activities (in the case of the poll tax riots) or to explain why a group or cause did not petition (in the case of the British Union of Fascists). It also means that we have used press coverage of well-known campaigns to test whether they eschewed petitioning as a medium or merely evade our search strategies. In these ways, we hope to avoid the methodological perils of a capacious subject, which falls outside the usual topics of cataloguing and research.

Conclusions and Contributions

Given the thematic and chronological breath of the research we have discussed here, we limited our geographic scope to petitions from or directed to Great Britain, though we hope future work will extend our approach to the island of Ireland. Even then, we are conscious that the attraction of examining a changing practice over a *longue dureé* is fraught with risks: It is impossible to be comprehensive and while we can survey a range of different movements and agents, we may not fully appreciate their significance or, indeed, marginality to wider concerns as the case may be. Hopefully, though, our investigative approach adds and enhances the institutional and thematic research into twentieth-century Britain, casting new light even as depends on others' approaches and findings to avoid stumbling in well-mapped territory through its concern for linking and drawing out the networks of associations between heterogeneous examples and 'trace' data of many kinds.

As well as its academic contributions, our work also aspires to inform and historicise the use of petitions as part of British democracy today. We are keen to share our insights with campaigners and those administering petitions systems, as well as interested members of the wider public and work with parliamentary officials and NGO campaigners, as well as fellow academics. This allows us to consider and address their questions in the course of our research. It also presents perils given that historical research seeks to understand the past on its own terms, in ways that may complicate, rather than direct, present beliefs and actions. Far from encouraging an uncritical approach to the past, our aim in all of this is to recover uncomfortable or alien worlds that may

not neatly or instructively align with current dilemmas or circumstances. Hence, we are conscious that a desire to share our findings must not lead us to adopting the modes of thinking familiar to civil servants or charity workers today, when we are recovering and assessing the impressions of the predecessors against a variety of grassroots, community involvement too.

So, while the project will help us think more carefully about e-petitions, in their continuities and discontinuities from earlier petitioning technologies, it is important to emphasise the wider historical contexts of campaigns. Our project cannot produce a set of lessons for petitioners or petition-mongers, but it can make both aware of the choices and assumptions they have inherited – or eluded. Moreover, its value also lies in producing an unusual glimpse at how the social, cultural, and political changes of mass democracy could be reflected – and harnessed – in a cheap, simple, familiar, but versatile genre: the humble petition.

Acknowledgements

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8. Follow the Money: Inside the Black Box of the Corporation

David Whyte (University of Liverpool)

In this paper, Whyte illustrates how the edifice of the corporation acts as a black box – a relatively enclosed system of social relationships – by ensuring that the internal and external workings of the organisation are generally obscured from view. Whyte proposes that it is the researcher's task to open the black box in ways that enable us to "see" beyond the boundaries that very structure imposes on our knowledge and to establish ways to "follow the money."

Introduction

The business organisation – or corporation – is a hugely significant institution for organising social relationships and social life. Indeed, in this respect, the corporation[1] may well be the single most significant form of organisation. Most of us work for a profit-making corporation or are positioned at some point on a supply chain that has a profit-making corporation at its head. Most people in the UK live in a house that is owned or part owned by a financial corporation. Our food, water, energy, transport and communications systems are all controlled and provided by profit-making corporation. Almost all of the world's wealth is processed through the edifice of a profit-making corporation. Yet, as an object of inquiry, from the outside, the corporation is an opaque structure. Finding ways of tracing what corporations and corporate structures do would thus open up a critical area of social organisation.

This contribution will show how the edifice of the corporation acts as a black box, a relatively enclosed system of social relationships. As it demonstrates, the corporation operates like a black box because it ensures the internal and external workings of the organisation are generally obscured from view. It is therefore the task of the researcher to open the black box in ways that enable us to "see" beyond the boundaries that very structure imposes on our knowledge and establish both systematised and "conjectural" ways to "follow the money," the methodological focus in the discussion that follows.

The Corporation as "Black Box"

The abstract idea that the corporation is a singular entity or "person" for the purposes of financial transactions and for specifying its wider legal status is fundamental to the way that the corporation has been historically constructed (Johnson 2010), both in practice (in accounting, in employment practices, in commerce, etc.) and also in theoretical terms (in legal and political theory and in managerial science). Although the precise regulatory bases for "corporate personhood" have varied widely across time and across national jurisdictions, there are two aspects that are generally held in common in contemporary liberal democratic states. First, corporations are recognised in law as "entities" distinct from the people who own or control them; and second, they are able to conduct commercial functions as if they were individuals (most notably, to enter into commercial agreements as contracting parties).

The social creation of the "corporate person" has had one overriding purpose: to reduce the *financial* risks or liabilities of the individual members of the organisation. By creating a formally autonomous organisation – a corporation – individuals could be protected from liability for financial losses. The paths that led to incorporation have a long history. The neutralisation – or at least the diminution – of financial liabilities was a core principle behind combinations of wealth that existed for centuries before the principle of *limited liability* finally became fully established in law in the early 19th century but it was with its establishment that the corporation was given full

legal expression (Harris 2000). The creation of the corporate person also entailed another key advantage: it guaranteed secrecy, because it created the corporation as a kind of closed system, a "black box." Bruno Latour's commonly cited definition seeks to explain how the boundaries of our technological knowledge are socially constructed. In his formulation, he argues that "success" and "efficiency" are the drivers of "blackboxing":

"When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become." (Latour 1999, 304)

In other words, the more smoothly something works in the socio-technical domain, the less it needs to be understood. This is a paradox: as a closed system gets "better" or more efficient, the process by which outputs are produced is less knowable and less amenable to being known.

The black boxed form that the corporation adopts is similar. Inputs and outputs are visible, but the ways in which the corporation processes those inputs and produces its outputs have become more and more unknowable as they have become more and more complex and hidden. The corporation is an opaque system. Yet this is not exactly Latour's black box; the corporate black box has not arisen from dynamic relationship between opacity and "efficiency" or "success." Rather, the corporation has been very deliberately designed as a black box where opacity is not a by-product but is one of the chief goals.

Entity Accounting and the Black Box

In the discipline of accounting, the concept of the "entity" provides a starting point for conceptualising the problem of "knowing" when it comes to corporate inputs and outputs. "Entity theory" provided a break from the conceptual bases of the earlier "proprietary theory," where no fundamental distinction is drawn between a legal entity and its owners or shareholders (Soujanen 1954), that until then guided the discipline. The basis of this break was that, in the commercial world, individuals would no longer be the primary object of accounting in the context of business but "entities" instead. Entity accounting enabled the business organisation, or corporation, to become the accounting object for the purposes of mapping its inputs and outputs, and assessing its overall financial performance, stability and so on.

Kurunmäki (1999, 219-220) has usefully summarised this process:

"The concept of an accounting or economic entity presupposes a more or less common agreement that something concrete, bounded and whole exists, and that accounting numbers are capable of reflecting that objective [thing] … To define an economic entity is thus to create and construct, to make and mould rather than merely reflect … Yet the making of an accounting entity is a political process with potentially significant implications. The boundaries which delineate an organisation as an economic unit separate from other organisations are not as clear-cut, natural or fixed as the accounting entity assumption implies. The actors who identify entities and define their limits are many and varied, and may speak on behalf of legal, economic, social, political, aesthetic and professional interests."

The process of creating an accounting entity thus creates its object for a particular purpose. And the making and moulding of the entity always has consequences for how a range of differing interests in the organisation are positioned. As a consequence, entity accounting profoundly affects our capacity to "know" about organisations through accounting practice.

When a corporation is treated as an entity, its accounts become formally separated from those of shareholders, managers and other significant groups of individuals that comprise the corporation. In other words, entity theory allows accounting to be solely focused upon the revenue, expenditure, assets, future value and so on of the *corporation* in isolation from its owners, or major shareholders. This approach is taken regardless of the "type" of commercial organisation we are talking about: partnerships, unincorporated commercial organisations, and incorporated privately owned and publicly traded corporations alike. The practice of treating the corporation as an entity in accounting probably became commonplace as the profession established itself at the beginning of the 19th century (Hines 1989). The accounting "entity" takes on a particularly significant role, however, in capitalist economies at the end of the 19th and beginning of the 20th century. The organisational dualism that Ireland (2017) has described as operating between functioning capitalists (executives) and money capitalists (those that invest as passive rentier shareholders) rested on entity accounting. That is, the accounts of the entity were separated from the accounts of individual *functioning* and *money* capitalists. In this way, treating the corporation as an entity for accounting purposes has very significant implications for how we account for the beneficiaries of the organisation: as soon as we treat the accounts of the corporation as entirely distinct from the accounts of the owners of the corporation, the income and the assets of the corporation become wholly separate from the income and assets of the individual (Husband 1954).

The development of these corporate accounting procedures in the 20th century laid the ground for flexible ways of accounting that at best make it difficult to fully comprehend what is going on and to follow the money to those that ultimately benefit from what the corporation is doing. At worst, corporate black boxing completely obscures who owns what, who earns what and indeed how we can recognise and "know" the social costs of asset ownership and revenue generation through business organisations. It is that process which anyone who seeks to open up any given corporate black box must come to terms with.

Inside the Box

The process of hiding "things" using the black box is broadly organised around two axes. First, there is the process of hiding the real social and financial relationships between people *inside* the box; and second there are the processes that enable assets and money to be distributed *within* the box. The black box thus has a dual purpose: to mask relationships between people and to mask the way that wealth is distributed as a result of constituting it.

In order to do this as effectively (and so non-recoverably) as possible, the corporation is typically disaggregated into a number of smaller separate sub-entities (subsidiaries and sister companies); the relationship it has with those sub-entities can be manipulated through changing the accounting relationship. Indeed, different forms of corporation may be used to manipulate those relationships. A key advantage is that the nuts and bolts of corporate operations (for example, asset ownership, the control of financial flows and the structuring of liabilities) can be distributed across the corporation's sub-entities. This process at the same time makes it difficult to define in law exactly which part of the corporate structure is responsible for particular operations. This process of masking both individual and corporate responsibility within the box is an effect known to lawyers as "the corporate veil."

The formation of long chains of ownership identity operating through multiple jurisdictions is the dominant form though which surpluses from the, for example, the extractive and agricultural industries flow from the Global South (Mikler 2018). Multiple personhood across nationality enables corporations to repatriate profits in any number of jurisdictions (Demsetz and Lehn 1985). They can cross borders freely and may use their multiple nationalities to exploit different regulatory

jurisdictions through practices such as "tax shopping" and "transfer pricing" (Bartelsman and Beetsma 2003). Holding multiple nationalities is also used to mask responsibility for causing harms (Bernat and Whyte 2017), because it effectively allows a multitude of "corporate veils" to be placed between subsidiary corporations. It is the complex relationship between those chains of discreet entities that enables legal requirements to be avoided or evaded and activities to be masked. When things go wrong, under circumstances that might trigger financial liabilities, the corporate black box makes it difficult to see individual beneficiaries and therefore makes it difficult to identify those individuals that might be held liable. The chain of command is similarly obscured by the corporate black box. Moreover, the creation of complex structures "inside the box" has, with a few scattered exceptions, generally prevented communities or workers from seeking compensation for workplace atrocities and environmental harms (Anderson 2001). Tax liabilities are also commonly diminished when corporations establish multiple identities that use secrecy jurisdictions (also known as "tax havens") to mask the origin of their revenues (Shaxson 2012). And, as has been noted, the purpose of "tax havens," aka "secrecy jurisdictions," is precisely this: to amplify the masking capacities of the black box in ways that make it almost impossible to see both the real social relationships and the flows of money hidden inside the box.

Being Systematic

So how do we look inside the black box? How do we unmask the relationships between people and unmask the way that wealth is distributed inside it? Depending on what the researcher is looking for, the process of looking inside the black box begins by using registers of incorporation that most legal jurisdictions require to be public. Those registers (in the UK, the public database held at Companies House) can be used to map basic information about the corporate structure and its financial flows. In most liberal democracies, it is possible to conduct a mapping process using a mix of the following: registers of incorporation, corporate annual reports and accounts (there is a legal requirement in most jurisdictions to publish basic accounts and details of significant shareholder, directors' remuneration and so on), and investor's reports.

While difficulties will be thrown up in any context where the targets of investigation have been set up to elude investigation, researchers who investigate private companies have developed systematic ways of doing so (e.g., Whittell 2014). The work of investigation typically starts by extracting basic data from corporation's public website and published accounts. If this is connected to a public limited corporation, that is, if it is a corporation that derives its capital base from shares traded on a stock market, then more detailed information still can be recovered from the full accounts published by Companies House including information on directors, information on parent companies and subsidiaries, and information on controlling parties. This exercise normally yields enough data to:

1. Map the entities within the corporate structure, and establish the parent-subsidiary relationship between each of them;
2. Establish the formal "ownership" of key activities/assets/revenues;
3. Scrutinise revenue flows between entities;
4. Establish the individuals with the most power in the management structure;
5. Identify inter-locking directorships within the corporate structure across different corporate structures;
6. Establish the significant owners and shareholders of the corporation, and how this ownership pattern manifests across the corporate structure.

This mapping process is not easy and requires at the least a basic understanding of accounting practice and a working knowledge of corporate reporting rules. Even where investigators possess

these core competencies, however, the ready availability of the key information needed to undertake this type of analysis is far from guaranteed. In many jurisdictions, there will be a basic foundation of source material to build on, like that indicated above. Nonetheless, this varies depending on the disclosure rules of each state.

There are other resources investigators can draw on, however. Statutory reporting data is usefully stored and analysed in secondary databases, such as the Financial Analysis Made Easy database ("Fame") to which most universities have access. Fame scrapes data from a range of public sources to enable corporate profiles to be generated quickly. One thing that Fame helpfully does is produce organisational charts of parent and subsidiary relationships across the corporate structure. Beyond resources like Fame, databases produced for the purposes of market reports and investors reports such as Bloomsberg Terminal provide a deeper level of analysis of the performance of particular corporations, and includes access to some third party investor reports. The problem is that those databases are not public, and unless an investigator is based in a university which subscribes to them, they will be prohibitively expensive to access. There is a harsh irony in the fact that researchers seeking the data necessary to follow the money are likely to face a paywall sooner or later.

There are other bodies of state-disclosed data that researchers can draw upon systematically. If a corporation or its officers have been prosecuted for regulatory offences, then there are a series of places that details relating to the corporate structure and its beneficiaries may be found. Those include prosecution registers, records of pre-prosecution actions by regulators or court records. If a corporation or its officers have been sued in a civil case, then this might also reveal key details about the corporate structure.

One example of how such information was identified and used successfully comes from the attempt to identify the ultimate owners of oil that leaked from the sinking of the Prestige oil tanker off the coast of Galicia, Spain, in November 2002. The Prestige disaster was perhaps the worst in Europe's history. In the immediate aftermath of the case, it was not clear either who owned the tanker or who owned the oil. In this case, a legal researcher, Robin Hansen (2008), used a series of previous court hearings, unrelated to the tanker disaster, in which Crown Resources Inc., the reported owners of the Prestige, has been cited to map the corporate structure. Once this corporation had been identified, other company sources, such as the annual report and accounts, were used by Hansen to supplement the court revelations. Hansen's investigation found that the oil tanker was indeed chartered by the Swiss company, Crown Resources Inc., and they were also the owner of the cargo. It was this corporation that had ostensibly given the instruction to the vessel to sail for Gibraltar where it was to wait for new instructions. It was on the way to this destination that the ship began to break up. Crown Resources Inc. was itself owned by a holding company based in Luxemburg ("Crown Luxemburg A.G."), that was owned by a holding trust, based in Gibraltar ("CTF Holdings Ltd."), in turn owned by another trust based in Liechtenstein ("Crown Finance Foundation"). This trust was owned by Alpha Group, one of Russia's largest investment fund groups with major interests in commercial and investment banking, asset management, insurance, retail trade, water utilities, and a wide range of other investments. Alpha Group is therefore the real owner of the oil carried by the Prestige. Using different companies located in several jurisdictions made the attribution of liability difficult, however, precisely as intended. The countries outside Russia involved in this secondary chain of ownership (Switzerland, Luxembourg, Gibraltar and Liechtenstein) are all tax havens, and are known for their protection of commercial secrecy.

Using details about the corporate structure uncovered by Hansen, it was possible to establish (by following the money trail from sources in the financial press, and from limited public information

on the Crown group of companies) that the various assets of Crown Resources Inc. were sold off in separate parts following the disaster. Those parts were then restructured around new enterprises, "Energy Resources" and "Commodities Trading Company," both based in Switzerland. This strategy enabled the real owners to distance themselves further from the Prestige disaster, avoid accusations of wrongdoing, and ultimately continue trading in exactly the same way as before (Catalán Deus 2003, 224-225).

The key problem revealed in this case is the creative way that secrecy jurisdictions are used to render the black box impermeable. In this case it was not possible to follow the money in a great deal of detail. In the end, figures relating to the gross value of Crown Resource Inc's assets were obtained by a German investigative journalist after establishing some detail about the sell-off noted above. However, despite this, investigators were never able to determine precisely *who* benefited from Crown's activities or the *value* that accrued to them.

Occasionally we do get to see inside the black box even when it has been carefully constructed and fortified in secrecy jurisdictions. Perhaps the most famous of those moments have come in the past decade with the disclosure of the Offshore Leaks, the Panama Papers, the Paradise Papers and, being reported on at the time of writing, the [Pandora Papers](). Important as those leaks are, however, they are always highly selective, and whilst they may reveal some systemic processes, at most they only open the box in a small minority of cases. What is more, to make anything of these records is a major investigative undertaking in itself. Smoking guns are rare and just having access to previously secret corporate data will not in itself resolve the difficulties investigators face.

Sniffing Out Class Power

In social science, the limits of systematic inquiry may be a more significant methodological article of faith than we are normally led to believe. As Ginzburg (1980, 27) has pointed out:

"In a social structure of ever-increasing complexity like that of advanced capitalism, befogged by ideological murk, any claim to systematic knowledge appears as a flight of foolish fancy. To acknowledge this is not to abandon the idea of totality. On the contrary; the existence of a deep connection which explains superficial phenomena can be confirmed when it is acknowledged that direct knowledge of such a connection is impossible. Reality is opaque; but there are certain points – clues, signs – which allow us to decipher it."

For Ginzburg, the "conjectural paradigm," an ancient form of knowledge construction that is more natural to human inquiry than "experimental science," allows for deeply contextualised observation to guide the pursuit of knowledge. Conjectural knowledge is constructed using techniques outside the ivory tower, techniques that do not need endless quantifiable verification or "proof" according to the standards of a particular academic discipline. Conjectural knowledge is based on familiarity with the sort of fine detail that is often ignored by generalising science. Thus, Ginzburg argues, this more widely held, popular form of knowledge may represent a more useful approach to social science research, since it is based on observation, experience, and a much longer term understanding of what we can generalise about than more putatively scientific or experimental approaches.

This is not to say that any research project into something as concrete as the social and economic relationships established in and around corporations could ever be done by conjecture alone. But, certainly, conjecture plays a very significant role: a particular form of conjecture that is critical of power, and that bases its investigations on its critical analysis.

This is really how we read corporate accounts and court transcripts and annual reports: we look for the detail that might take us in a particular direction in our inquiry. We come across things in reading those accounts that are, conjecturally, telling. Let us take two examples of this. First, we might read a particular company's accounts and see that dividend payments to shareholders were much higher than expected. The narrative detail explaining this rise in dividends would not necessarily be included in the annual report, or in the annual accounts. Second, we might notice that a significant part of a corporation with a majority, tycoon shareholder, is owned by a holding company with a director who shares the same family name as the tycoon shareholder. But the limits of restricting a method of inquiry to those sources alone is obvious. The trail can end quickly inside the black box if our inquiry is delimited to its boundaries.

But what are the conditions that enable those observations to be made more significant? Why might those things become significant in the context of an inquiry into the corporate structure. A more basic question concerns how the researcher can even know if those trails are worth following up. Can these clues, these telling details, be usefully understood beyond the black box, by using a more conjectural approach? This is where researchers need to draw upon less formal, less systematised ways of working which involve determining how progress might be made. This all seems a bit mysterious and lacking rigour, flaky even. Yet our decisions to follow Ginzberg's invocation to seek the detail need not be flaky or mysterious.

In fact, it was exactly the kinds of loose details noted above which ended up being unpicked by researchers in order to investigate possible financial misconduct in Philip Green's Arcadia empire. These were details that may have been left uninvestigated had there not been a long-standing suspicion about Green's business methods. And had part of the empire not collapsed in 2015, it is much less likely that journalists would have seen any reason to go back to the accounts and sniff out the trail.

In the Arcadia case, some investigative groundwork had been done some 12 years before. In 2003, the Guardian newspaper commissioned a chartered accountant to scrutinize BHS's published accounts, one of Arcadia's holdings. That investigation resulted in a front-page exposé revealing that BHS was being systematically over-valued in a process that allows us to understand the forms of asset stripping that were to take place in the years to come. In 2015, the widely reported data leak from HSBC's Swiss private bank revealed to financial journalists details of an Arcadia shareholder who had withdrawn £2.25 million in cash from HSBC's Geneva office in September 2005. The original source of the money was revealed to be a bank account in Monaco held in the name of Philip Green's wife Tina Green (Shah 2017).

This was the smoking gun that led journalists – including the Sunday Times' Oliver Shah, who won business journalist of the year in the 2017 Press Awards for his investigation of Philip Green's sale of BHS – to unfold two important stories about the Green empire: first, that exactly the same type of complex corporate structure described earlier in this paper had facilitated financial flows from employees' pension schemes into the business (and ultimately ending up as dividend payments to the Greens and a small number of other large shareholders); and second that Tina Green was the owner of all of the shares in a corporation called Taveta Investments, which in turn owned all of the shares in Arcadia Group. Subsequent investigations, using published accounts, were able to identify a total of £2bn dividend payments made to Tina Green via this route.

This diversion into the work of investigative journalism raises questions about how far the techniques of investigative social researchers differ from investigative journalists (Gans 2018). One important difference for our purposes is the ontological approach typically adopted by the former. At a very micro level, social scientists are trained to recognise power as a dynamic in their

relationship with research subjects, and are trained to be sensitive to unequal power relations between human beings. If a researcher is sensitive to the ways that *class* power – understood in here as the systematic ways in which a group of people who share common economic interests, based on their social position, are able to collectively promote those common interests and goals – works at the level of the corporation, then this may be one aide to deciding whether to follow up "the slightest trace" of something that seems to be significant.

On the other hand, the reason that business journalists might be well equipped to sniff out the detail is that they know something about how power works in the world they investigate; they know the habitus of the business class. "Insider" knowledge of the culture underpins the ability to deploy the conjectural knowledge needed to investigate the business world. And this is something that social scientists rarely have. There are important exceptions (for example Ho 2009), but researchers must try to understand something of the worlds they are researching. When it comes to the corporation, this is what many of us do. We follow the money not merely based on what is objectively verifiable and observable but based upon what we know of the corporate world, based that is on our long-held understanding of what corporations do and why they do it. In a world that is largely hidden from view, this needs a great deal of conjecture, as Ginzburg (ibid., 13) might put it, "to sniff, to observe, to give meaning and context to the slightest trace."

Moreover, as this discussion has shown, a conjectural approach is made possible by two conditions. First, there needs to be a *motivation* to follow a particular lead. The social interest in, and the significance of, the cases referred to in this paper (the Prestige oil disaster and the collapse of BHS) gave investigators good reason to devote time to sniffing out the detail. Second, there needs to be a *capacity* to work in a conjectural way. In the case of Hansen's piecing together of court records, he needed to know not just where to look, but how to look and what to look for in case files. The journalists who followed the money as it passed through the Green empire also relied on a deep appreciation of the culture of the industry and the leads provided by insiders as guides. Those are not methods that are easily systematised.

Conclusion

The work of reconstructing the social relationships inside the corporate black box and accurately following the money is a task that is always dependent upon how well the money and the relationships have been hidden. For this reason, we have to conclude rather negatively, that a systematised methodology for researching the black box of the corporation is not always going to do what researchers need to do: to get close to the trail and "follow the money."

This problem is, quite literally, a structural one. The primary purpose of creating the corporation as a "person" in law and as an "entity" in accounting was to shield investors from full exposure to liability, thus providing incentives to invest and grow the economy (Whyte 2020). A central part of the same mechanism has been the creation of a black box that protects both investors, and those with significant control in the corporation from scrutiny.

Of course, as researchers, we need to use the information that is publicly available to us as systematically as possible. And yet, this is a problem when that publicly available information distorts and distracts us from our quest for knowledge. The boundaries of knowledge that determine what we see inside the box is constructed in and by the rules and practices guaranteed by state institutions, and by the disclosures made within the bounds of those rules and practices by corporations themselves. Our raw materials in corporate research projects are not only incomplete, this incompleteness is determined *by* the objects of our research: corporations themselves. Thus, by definition, this is a form of research that can never be *fully* systematised. Yes,

there are systems in place (Whittell 2014) but those systems are always highly bounded in terms of the knowledge claims we can produce and the conclusions we can come to. The institutional architecture of the post-19ᵗʰ century corporation – in particular its construction through law and accounting practice – is designed to lead us away from the scent of anything suspicious. Neither the systematic nor the conjectural are, or ever could be, separate methods then. In order to understand what is inside the box, we always need to make our investigative way using both.

Notes

[1] For the purposes of this paper, the 'corporation' falls into a number of categories: business organisations that are privately owned by a small number of powerful owners, companies with shares that are bought and sold on "public" stock markets, limited liability partnerships, trusts and so on. The characteristic that unites what is described here as the 'corporation' is that they are organisations established as independent entities with the primary aim of making a profit for a group of owners, members or shareholders.

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9. Visual Studies of Police Violence

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In this paper, Watson, Meehan, Lynch, Nave, and Dennis discuss their investigations of how video evidence is used in criminal trials for police officers charged in on-duty shootings. Although still ongoing, their study has already yielded several lessons worth sharing. The authors consider how making sense of the violence seen on video is no simple task. They conclude that to understand videos of police violence they needed to turn to courts of law rather than directly analysing videos of police violence. In this sense, their research led to an investigation of investigations.

Introduction

This contribution discusses a study in which we have been engaged for two years, investigating how video evidence is used in criminal trials for police officers charged in on-duty shootings. The study is ongoing and our findings are only starting to fall into place but we nonetheless already have several lessons worth sharing for those interested in understanding the complexity of this kind of evidence. Despite a broadly held cultural maxim that "seeing is believing," we find that, even among members of our own team, making sense of the violence we see on video is no simple task, and we often come to different conclusions about the propriety of violent force. We, of course, are not alone in this: Christopher Schneider's (2016) analysis of comments on a video of the shooting of Sammy Yatim by Constable James Forcillo posted to YouTube showed remarkable use of details outside the video itself to make sense of the ambiguous scene depicted. The inescapable ambiguities associated with this form of evidence led us to conclude that there was little to be gained by directly analysing videos of police violence in our study (cf. Collins 2008; Lowrey-Kinberg and Buker 2017). Instead, we followed the methodological advice of Harold Garfinkel and Harvey Sacks, who instructed students interested in some phenomenon to *find someone whose job it is to interpret that phenomenon* (in this case videos of police violence) *and have them teach us how they do it* (Garfinkel 2002, 182). Thus, we concluded that to understand videos of police violence we needed to turn to those who are officially sanctioned to decide when violence is unlawful – courts of law. In this sense, our research involved us in an investigation of investigations, where the courts were attempting to decide *what happened* and we were attempting to understand how they came to determine that for their practical legal-investigative purposes. Following, among others, Ginzburg's (2013 [1976]) pioneering analysis of transcripts taken from the trial of a miller during the Roman Inquisition in the 16th C, our view is that this kind of second order investigation of investigation reveals something important about the social, cultural and institutional spaces, practices and imaginaries police-involved shootings are situated within that would be difficult to draw out in other ways – and it is in drawing those insights out that we see our contribution here as resting upon.

To expand and concretise the issues somewhat more, there are several complicating factors when it comes to dealing with videos of police violence. Bittner's formulation of police force is instructive: "the role of the police is best understood as a mechanism for the distribution of non-negotiable coercive force *employed in accordance with the dictates of an intuitive grasp of situational exigencies*" (1970, 46, emphasis ours). Police are mandated and expected, under appropriate circumstances, to use (up to) lethal force in the appropriate conduct of their job. However, as the public gains greater capacity to scrutinise the dictates of situational exigencies (at least in part due to proliferations of video evidence), and as video evidence has diminished the capacity of the police to control the narrative of use-of-force incidents (Wasserman 2017), recurrent questions about that "intuitive

grasp" have emerged. Here, we hope to argue that for those concerned with the incidents of violence depicted in video, there is a path for help from social science. That help arrives not in further analyses of videos, but rather in an examination of the *rules* that govern police conduct as well as after-the-fact analyses of that conduct. Examining how *rule-adherence* or *rule-deviance* is demonstrated through court interrogations thus affords sociologists an opportunity to critically engage, among other things, with the sense that is made of state violence on video from within the official settings charged with that very task; no small matter.

A Statement of the Problem: Seeing Things from an Officer's Perspective

Videos of police violence are challenging materials. The victim is often (although not always) outnumbered, unarmed or less armed, intoxicated (sometimes visibly) or otherwise disoriented, and can be interpreted as making efforts to comply with police orders. It is worth noting that the incidents we examine involve some *prima facie* evidence of wrong-doing, and as such we spend relatively little time examining incidents where use-of-force is self-evidently lawful (i.e., use-of-force in response to an armed suspect). As Collins (2008) notes, very few people engage in violence themselves, and interpreting videos of violence is constrained not only by the limitations of technology (camera frame rates, lighting conditions, sound recording or a lack thereof, blur and other recording artifacts, etc.), but also by the moral valence a viewer applies to the material. For some viewers, violence can never be excused, whereas for others any use-of-force by police will be seen as lawful because of the character of police work.[1]

In legal circumstance, there is an added layer to the analysis of video evidence. Courts acknowledge that police officers are imperfect and can make "bad" decisions in "good faith." Courts in Canada and the United States explicitly instruct triers of fact not to assess police conduct with "20/20 hindsight," and instead to adjudicate incidents according to an *objective* assessment of the officer's *subjective* perception at the time. This puts triers of fact into scenarios where they are pulled in opposing directions because they have to use (often graphic and disturbing) video evidence, as well as various interpretations and expert analyses thereof, to assess what an accused officer was seeing and experiencing in the moments leading up to a shooting, including making some assessment of physiological responses to stressors that are associated with life-or-death incidents such as "tunnel vision" or "auditory exclusion" and using (quasi-) scientific considerations of physiological response times. The *interpretive asymmetries* (Coulter 1975; Mair et al. 2013) between an officer's on-the-scene perception and a trier-of-fact's *post hoc* interrogation of that perception render video evidence less meaningful than might be otherwise expected. Officers can go so far as to concede that they were mistaken in their decision to use lethal force, but that some combination of factors on the scene, either physical or psychological, produced conditions for a good-faith mistake that results in a tragic lethal outcome.

The sociological problem therefore extends beyond merely trying to resolve disparate post-incident assessments of legitimacy across broad populations to produce consensus on what individuals see in videos of violence. Instead, it is better conceived as one of understanding how video facilitates the task of seeing through another individual's eyes and grasping what they were experiencing. As Garfinkel and Sacks (see, e.g., Garfinkel 2002, 181-182) instructed, rather than trying to codify or define the parameters of legitimate use of force, we turn our attention to those who do this professionally and allow them to teach us how they do it.

Methodological Procedures for Viewing Video Evidence

We generally describe our approach as ethnographic, albeit more in accord with Dianne Vaughan's *documentary ethnography* (1996) than more conventional observational fieldwork. We have acquired

courtroom transcripts and/or videos of eight criminal trials for on-duty shootings – four convictions and four acquittals – and as a team we collectively re-watch or read through the trials while engaging with video and other evidence. Perhaps the most important "methodological" consideration is the composition of our team; while we are sociologists / criminologists / anthropologists by profession, each member of our team has background in an area that contributes to our analysis of the trial. This includes a former police officer who has considerable experience with use-of-force policies, a police ethnographer who has significant experience in ride-along research, a socio-legal studies scholar and trained lawyer, and scholars of socio-legal procedure. Our position in viewing the trial roughly emulates that of jurors – we attend to the arguments and testimony and then collectively discuss what we have seen. However, unlike jurors, we take an *ethnomethodologically indifferent* orientation to the arguments made. We are not trying to verify the evidence or second guess juror's decisions, but rather to closely consider what is assumed to be known-in-common or presumed evident by lawyers as they craft narratives that accompany video evidence.

This is likely a methodological stance that requires some further expansion, as it is not uncommon for Garfinkel's attitude of *indifference* to raise eyebrows (Coser 1975). We are certainly not indifferent to the moral implications of use-of-force incidents that disproportionately affect Black, Indigenous, and People of Colour (BIPOC) communities. Indeed, this is largely our motive for engaging in study in the first instance. If we must live in a world with police,[2] we would prefer to see police officers *and police services* held accountable for killings of especially unarmed individuals. However, our personal opinions on where criminal culpability begins or ends take a back seat to the arguments and decisions by those empowered to make them – i.e., lawyers and jurors. Ethnomethodological indifference does not mean we are ambivalent to killings, indeed if we were, we would not be engaged in the study in the first instance. Instead, we attend to how rules that govern police conduct, court procedure, evidence, and jury instructions acquire their meaning through use. However we may want the rules enforced is set aside and we instead attend to the artful practices of appealing to the letter of a rule and the intention alongside that rule's invocation.

This perspective is inspired by the later works of the philosopher Ludwig Wittgenstein (1953, 1969) as well as Peter Winch (2003 [1958]), which argue (roughly) that the meaning of a rule is its use (Zimmerman 1971; Sharrock and Button 1999). The implication of this approach is, following from the guidance from Garfinkel and Sacks above, that there is limited utility in attempting to read formal codes of conduct and layer over them some empirical example of a candidate breach of that code to test whether a trier-of-fact *got it right* – who are we to make such determinations? The task instead is to investigate how the candidate breach is conceived of either aligning or deviating from the code in practice. This work is done, most transparently, in courts,[3] but a courtroom proceeding does not merely hold up video (or any other) evidence to see how it compares to the letter of the law. Instead, the search is for *good reasons* for a *prima facie* bad decision. Watching court proceedings results in a live exercise in interpreting and applying a rule and considering a rule's malleability in light of the inherent unpredictability of social life, including the social life of police officers evaluating individual conduct. It seems to us that a great deal of this work does not revolve strictly around rules at all, per se. The focus tends to be on how an officer's testimonial narrative holds up to the scrutiny of video and other evidence.

In addition to video evidence and officer testimony, we have come to expect expert witness testimony in nearly every trial for police involved shootings. This has been a standard tactic since at least the trial of the four Los Angeles Police Department officers charged with brutality offenses in the arrest of Rodney King in 1991 (Goodwin 1994). The significance of expert opinion was illustrated through that trial. In the initial criminal trial, an expert witness, LAPD training sergeant Charles Duke, was introduced by the defense to opine, using the bystander video and still images,

that King's movements would be reasonably interpreted by officers at attempts to resist arrest, necessitating force. The prosecution in the state criminal trial held that the brutality in the video spoke for itself. The result was all four accused officers were acquitted. In a subsequent federal civil rights trial, both prosecution and defense employed expert witnesses to interpret the video and two of the four officers were convicted.

Much like the position of ethnomethodological indifference, the Bloorian (1976) principle of *symmetry* absolves the researcher of deciding whether evidence is *right* or not. Instead, the principle notes that all beliefs, true or false, are premised on the same types of causes (Galassi 2019, 33), so analytic attention is paid to the formulation of the (quasi-) "scientific" information that is presented in trial to assist a trier-of-fact in making a decision about use-of-force incidents. In particular, we have been struck by the pervasiveness of something called "Force Science,"[4] which constitutes, among various other aspects of police interactions, the amount of time physically required to perceive and react to a threat as well as the cessation of that threat. While we remain somewhat personally perplexed by the claims of the accredited experts who opine on "Force Science," we maintain the principle of symmetry in our analyses. We are not (at least immediately[5]) invested in debunking force science as much as we are intrigued by seeing its reception in criminal proceedings. Of significance to the venue of an adversarial criminal trial is legal counsel effectively go about the process of introducing and interrogating "Force Science" for us, holding the claims made about some officer's conduct to scrutiny for the overhearing audience, the judge and jury. Our job is to discuss the positioning of "Force Science" within the broader discussion of the trial to gain purchase on how such information relates to arguments made with video evidence. "Force Science" becomes another technique of building meaning into otherwise complex and esoteric video materials.

Expertise in Trial: The Case of Roy Oliver

On April 29th, 2017, Officer Roy Oliver and his area partner Tyler Gross of Balch Springs Police Department, Texas, were called to the scene of a house party attended by dozens of adolescents. The officers were responding to a call for service to break-up the party on grounds of noise violations. The call out was recorded on both officer's body worn cameras, and interactions between officers and youths as the party-goers were dispersed were described as amicable and professional by both prosecution and defense counsel at trial. After the house was nearly cleared and the officers were moving toward the exit, a series of gun shots rang out nearby, and the departing youths on the street were seen running away from the apparent source of the shooting. Officer Gross immediately went toward the location where the shots were presumed to originate, while Oliver first went to his vehicle for his department-issued MC5 carbine rifle (nearly identical to the more commonly known AR-15), before proceeding to back-up Gross. As Gross approached a T-intersection at the end of the street with his service pistol and flashlight in hand, he observed a black Chevrolet Impala reversing and maneuvering toward the intersection. Unaware of who the occupants were, Gross ordered the car to stop and those orders went unheeded by the driver. Gross first spoke then yelled the car's license plate number into his police radio, which Oliver heard over his radio and testified heightened his perception of threat posed by the vehicle, leading Oliver to break into a run to catch-up with Gross. As Oliver ran toward Gross and the Impala, the car shifted into forward gear and began to accelerate past Gross and away from the scene. Gross reached out with his pistol hand, striking and breaking the rear passenger side window of the car. A mere 0.31-milisecond later, Oliver shot at the now evidently fleeing vehicle, a single burst of five bullets from the MC5, one of which struck the front passenger, 15-year old Jordan Edwards, in the head, killing him instantly. Moments later, other responding officers from Balch Springs PD performed a "felony stop" on the car and discovered the occupants were teenagers who had been at the party and were not involved with the shots heard to spark the incident. Oliver

was subsequently fired from BSPD, criminally charged, and convicted for the murder of Edwards. He was sentenced to 15-years in prison on August 29th 2018, although both his sentence and conviction are being appealed to the Texas Supreme Court at the time of writing.

Body Worn Camera Evidence

The incident took place at night and the BWCs used by BSPD were not well suited for recording in low-light conditions. In addition, both Gross and Oliver were moving continuously throughout the incident, resulting in the cameras shaking, diminishing the quality of visual recording such that, for us, the images were nearly incomprehensible. The audio recording was much more reliable, and seconds after the shooting Oliver is heard saying to Gross "You alright? He was trying to hit you." Gross responded he was fine, but otherwise did not reply to Oliver. After dozens of viewings, no one on our team could make sense of the scene through the video evidence, or how the evidence could possibly feature in trial.
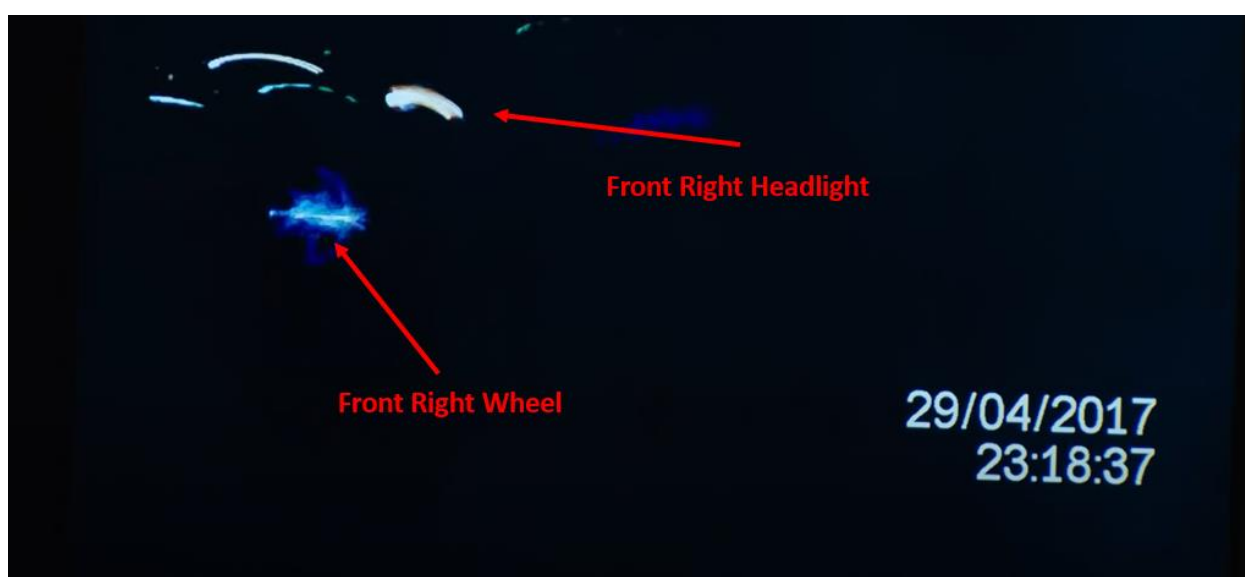
Figure 1: Screen grab of Oliver's body camera as he is shooting. Readers should note the visible outline of the Impala's front right tire and headlight, one of the few frames from the video where any part of the car is recognisable in Oliver's video.

On day three of the trial (August 20th 2018), the prosecution introduced expert witness Grant Fredericks, a former Federal Bureau of Investigations (FBI) forensic video analyst who now runs a private consultancy offering expert opinion often, though not exclusively, in police use-of-force cases. Fredricks has a national reputation among legal counsel and law enforcement officers in the United States for being at the forefront of forensic video reconstructions, and is a member of the board for the Force Science Institute. Fredricks was commissioned to reconstruct the scene with laser spectrometry and other modes of image reconstruction that would, within fractions of an inch, indicate where Oliver, Gross and the Impala were at the time of shooting. Although a detailed discussion of Fredericks' testimony, which lasted almost two full days, is not possible in this paper, of relevance to us is Fredericks' submitted opinion: that, upon reconstructing and analysing the scene, the Impala had driven past Gross by the time Oliver began shooting. Thus, Fredricks concluded that Oliver's use-of-force was unreasonable because the car could not have been perceived as a threat to Gross since it was beyond him before Oliver started shooting. If Oliver could not be perceived as reacting to a threat, his actions should properly be seen as motivated by

malice – i.e., revenge upon the driver and/or occupants for failing to adhere to Gross' instructions – as opposed to a measured reaction to a perceived threat, erroneous or otherwise.
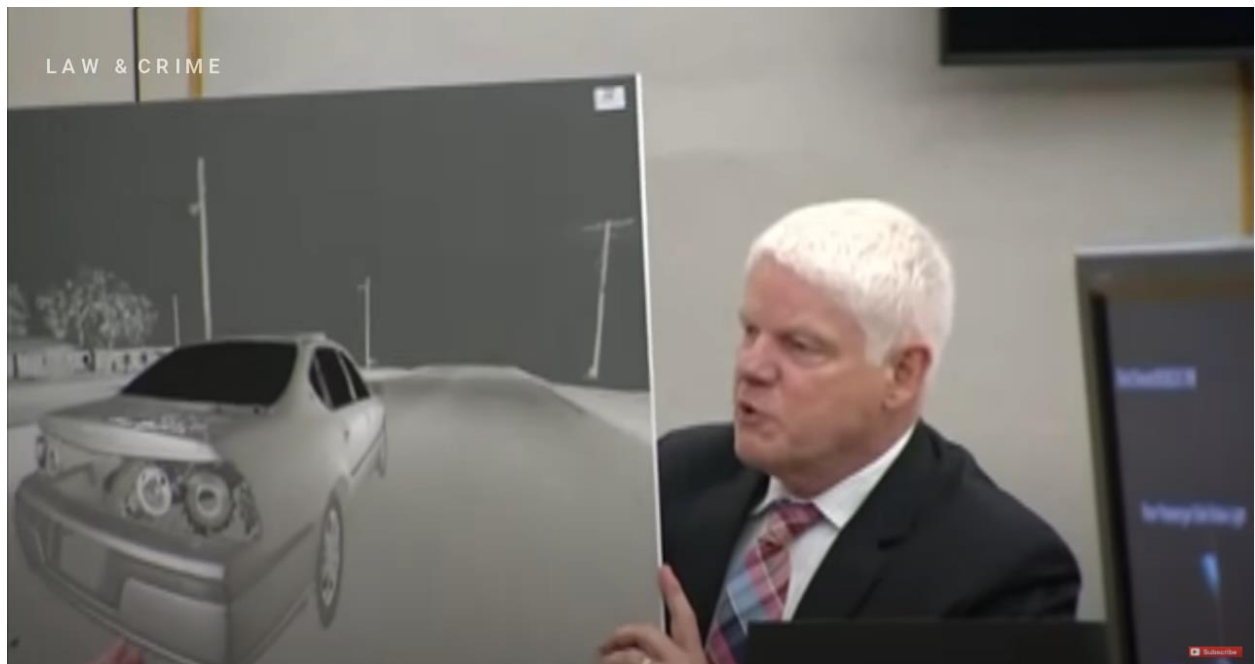
Figure 2: Grant Fredericks holds the output of laser spectrometry modelling to show where the Impala was relative to Officer Gross' body cam the moment Oliver shoots the first bullet.

"Force Science" and OODA Loops

Partially in response to Fredericks' testimony, Oliver's defense counsel introduced their own expert in "Force Science," police Captain Jay Oliver Coons, who also has a side business opining as an expert witness in use-of-force cases. The defense sought opinion from Coons on the issue of reaction times, and how long it takes for human beings to make the decision to shoot and stop shooting. Using a concept from "Force Science" called OODA loops (Observe, Orient, Decide, Act), Coons opined that it takes anywhere from 0.5 to 1.5 seconds for a police officer to see, interpret, decide to act and then (re)act to a perceived threat. This being the case, Coons opined that Oliver would have made the decision to shoot at the Impala to protect Gross while Gross was on a possible path along which the vehicle may have proceeded. That decision may only have manifested after the car was passed Gross, but for Coons, since the decision to shoot apparently preceded the physical pulling of the trigger by such a significant time, Oliver's actions should have been deemed reasonable, as in Oliver was acting on a good faith mistaken belief that the vehicle posed an imminent threat of death or serious bodily harm to Gross by its speed, proximity and (potential) trajectory.

Figure 3: Cpt. Jay Coons (left) demonstrates to the jury what Oliver's body-cam showed when he believed the decision to shoot occurred.

Coons recalled that it was shown through video analysis that only 0.31-seconds occurred between Gross striking and breaking the rear passenger window and Oliver shooting, which for Coons indicated that Gross, by necessity, would have been within an arm's length of the car and the car would be moving alongside Gross as Oliver formulated the decision to shoot. Coons' explanation is that the reason the shooting started after the car had passed Gross was merely a consequence of the frailties of human reaction speeds, not of intent on Oliver's part. Of interest here, perhaps, is how Coon's "Force Science" leveraged analysis was framed by its appeal to ordinary human capabilities, and thus partly aimed to show how "normally human" rather than how extraordinary officers are.

As Wittgensteinian ethnomethodologists, we are of course fascinated by the somewhat curious employment of the term "decision" through Coons' testimony. However, following both ethnomethodological indifference and the symmetry principle, we do not take it upon ourselves to decide which of these two competing accounts (Oliver was unreasonable, Oliver was reasonable) is correct, or to conduct an extended analysis on the vernacular usage of "decide" in context, since this was not a significant issue in court. Indeed, we are not even confident jurors would have any strong opinions on either testimony. We are instead interested in how the notion of "motive" gains salience for a jury through the apparent positioning of the vehicle proposed by Fredericks (a spatial argument) and the ostensible reaction times proposed by Coons (a temporal argument). We would have to conclude that were jurors convinced by Coons' testimony, and they believed in the science of OODA loops, they almost certainly would have had to decide Oliver was acting on a good faith mistaken belief the Impala posed a threat to Gross. That they convicted Oliver seems to indicate they were unconvinced by the veracity of Coons' particular invocation of "Force Science" on this matter.[6]

Conclusion: Making Sense of Videos of Violence

We are in full agreement with Randall Collins (2008) that videos of violence are remarkably complex materials that by no means establish their own sense. When we study videos of police

violence, it is hard to hold back on personal assessments of what is right or wrong about the conduct of officers or victims of police violence as seen on video. Our position is that it makes little *sociological* sense to do so, or at least doing so is not an activity reserved to sociologists. In a democratic society, policing is conducted *with the consent of the public*, and we would contest that anyone has as much right as anyone else to make arguments about the propriety of what is seen in recordings of violence. For us, the sociological interest arrives when we start of consider how these assessments are made. Looking at how video features to produce accusations or defences in cases of police violence, in our opinion, not only leads to better public understanding of the decisions of courts, but also potentially allows for greater public scrutiny of those decisions in ways that can lead to a more civically appropriate interpretation and application of rules. Given that a rule gains its meaning through its use, we see little utility in simply reviewing videos for candidate faults and asking policy makers to re-write rules in light of our objections; to us, there are sufficient rules in place to thoroughly enforce police misconduct. The issue for us, instead, has much more to do with how officer intent and *reasonableness* is injected into the images caught on video.

Through this contribution we have argued that our own personal interpretations of police violence on video are not of particular sociological significance, and that a more sociologically interesting question is to consider how those whose job it is to make such assessments use video to do so. We also note that analysing these cases involves more than mere deferral to rules (i.e., prohibitions against shooting at individuals under certain circumstances such as into moving vehicles), and that these legal rules gain their sense through their application in court. These are also important contributions to cognate disciplines such as psychology, legal studies, philosophy, criminology and police studies, and others taken up with issues of perception and applications of rules. Our interest in what constitutes a "reasonable officer" is furnished by attending to the arguments made by those who opine on the subject, investigating the investigators, to see how they attribute things like "motive" and "reasonableness" through video and other evidence. We would stress that video evidence is not a panacea, not only because of technical frailties exhibited in this case and others, but also because the phenomenon of interest – officer intent – cannot be recovered through video viewing alone. This necessitates an investigation into the properties of interrogating video and other evidence to make sense of what a police officer must have experienced when using lethal force. By introducing the methodological tropes of ethnomethodological indifference and the principle of symmetry, we do our best to bracket out our own interpretations of these scenes and defer to the way sense is derived through expert testimony. We put ourselves alongside the jury, trying to make sense of the evidence as it is presented, and in light of the decision at which jurors ultimately arrive. This said, we fully acknowledge we are not broadly indifferent to our topic; each of us is motivated to deliver justice and "better" police services, albeit we may not fully agree on what "better" police services are. We merely hold an indifference to legal arguments, as it is not our place to second guess jurors, rather than to understand their decisions. A final word on investigations: as Garfinkel (1967) and Ginzburg (2013 [1976]) showed, investigations are part and parcel, indeed constitutive, of social orders. Investigating investigative practices thus offers an interesting reflexive take on investigative methods, insofar as it invites us to consider the place of investigations in our social, cultural and political worlds – our own work included – rather than simply taking it for granted.

Notes

[1] Readers may recall Cleveland Police Patrolmen's Association president Jeffrey Follmer's news interviews following the Tamir Rice shooting, in which he suggested there was no such thing as a bad police shooting.
[2] We add this caveat in relation to the recent public discourse around defunding or abolishing (disbanding) the police that gained significant public attention in the wake of the killing of George

Floyd by Officer Derek Chauvin, May 5th 2020, and the vote of Minneapolis City Council to disband their municipal police service shortly thereafter.

[3] Although in a subsequent project we are investigating a similar process in the investigative stage of police use-of-force incidents that do not result in criminal charge.

[4] We capitalise "Force Science" on the grounds that it is a brand name, a "research institute" that offers training and consulting services, rather than a coherent body of inquiry. Indeed, the institute incorporates several different disciplines, including medical science, behavioural science, and assorted forensic sciences such as ballistics to study "… the true nature of human behavior in high stress and deadly force encounters."

[5] There is a significant body of research on the questionable character of forensic sciences or the capacity of courts to evaluate scientific evidence (i.e. Jasanoff 1995; Cole 2000; Faigman 2002; Burns 2008). We would be interested in seeing future studies that apply the analytic lens from these studies into a considered analysis of "Force Science" and its practitioners.

[6] Coons was the only witness called by the defense other than Oliver himself. While we would be reluctant to conclude this makes Coons key evidence (especially since the defense only has to raise reasonable doubt about the prosecution's case), it perhaps does show the defense's confidence in that evidence.

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10. The Emergence of New Diseases: Hybrid Methodological Approaches and the Case of CKDnt

Jason Glaser (La Isla Group/London School of Hygiene and Tropical Medicine, University of London) and Ciara Kierans (Chapala Social Science and Humanities/University of Liverpool)

In this paper, Glaser and Kierans provide an account of two closely aligned investigative trajectories reflecting new forms of kidney disease and how those trajectories have led them to propose an integrated framework for assessing and addressing these emergent epidemics. The authors show that the problem of kidney failure without warning or explanation cannot be addressed by single or unitary disciplinary approaches but requires genuine collaboration and alignment. Achieving this requires challenging disciplinary imperatives, entrenched biases and assumptions through investigations.

Introduction

The problem of kidneys failing without warning or adequate explanation constitutes a newly recognised but likely long extant problem across different global sites and settings, with new modes of hybridised investigative inquiry emerging in its wake. This paper provides an account of two closely aligned investigative trajectories, reflecting new forms of kidney disease linked to (a) working conditions in Central America and (b) sites of social and environmental degradation in Mexico and how those trajectories have led the authors to propose an integrated model for assessing and addressing these emergent epidemics, a challenge likely to increase in frequency due to human encroachment on fragile ecosystems and global warming. The nature of these problems are such that they cannot be addressed by single or unitary disciplinary approaches and require genuine collaboration and alignment. This is now already well-recognised across both the human and natural sciences, embodied in a growing array of inter and transdisciplinary approaches, *inter alia*: syndemics (Singer et al. 2017); biosociality (Seeberg et al. 2020); bioethnography (Roberts 2017); embodiment perspectives in epidemiology (Krieger 2005); more-than-human approaches (Tsing et al. 2017). How to achieve this is, however, far from easy without challenging already existing disciplinary imperatives, entrenched practices, ingrained biases, assumptions and epistemological starting points.

Uncertainty and Failing Kidneys

Rapid kidney failure without precedence is today shaping new understandings of the entangled relationship between health, society, work and the environment. The condition we are referring to is sometimes described as an epistemic problem with much contest over aetiology e.g. Chronic Kidney Disease of Unknown Origin (CKDu) or indeed Chronic Kidney Disease of Non-Traditional Origin (CKDnt) as lines of "evidence" and association are slowly built up. The condition is also described as a problem of place and population: e.g. MesoAmerican Nephropathy (MeN). Nomenclatures aside, this newly recognised variant, or indeed variants, of kidney disease is one where forms of knowledge production and contextual concerns critically matter. In this paper, we attend to their significance. We will use the Pan American Health Organisation (PAHO) designated acronym CKDnt (Wesseling et al. 2020) – as it best addresses alternative and multiple modes of CKD emergence beyond normative causal processes.

Photo 1: Former sugarcane worker Ramon Uriel Munguia, pictured at 27, now deceased from CKDnt, lost his father to the same disease. [Photo taken by Ed Kashi/VII]

As Wesseling and colleagues point out, CKDnt dispropotionately affects working age men, often as young as 25, and the mortality in affected areas of endemic countries is frequently >30/100,000. The average age of those in end stage disease at dialysis centers in El Salvador, for example, is 34 (personal communication with Hospital Rosales, San Salvador) and this grim number does not reflect the thousands who do not have acceess to care in overstressed health systems. CKDnt kills those in their prime earning years and this is exacerbated as the disease is largely asympotomatic and evades traditional kidney disease urinary screenings looking for proteinuria, until the advanced stages of disease. The disease is considered of epidemic proportions in Mesoamerica by PAHO and is potentially of pandemic proportion though surveillance among the populations identified at risk is still inadequate.

The two cases we describe raise many overlapping concerns despite having divergent investigative starting points and possibly differing aetiologies. They shed light on what research on this and similar challenges may look like by ensuring the needs of affected populations are kept front and centre. In what follows, we provide accounts of their respective trajectories of understanding, as work-in-progress, rather than offer after-the-fact reconstructions. This helps us to show what it means to follow a problem, as that very problem is being made. Our field-work trajectories are, therefore, fashioned as much by expedience, intuition and serendipity (Ginzburg 1979) as they are by disciplinary and professional logics. By paying attention to investigative practice, we also ask: what (as well as who) makes a disease?

Case Study 1 – Avoiding a Square in a Circle Hole: Puzzling Through the CKDnt Epidemic in Mesoamerica

Chronic Kidney Disease of non-traditional cause (CKDnt) affects millions of workers and impoverished communities in Latin America and South Asia (O'Callaghan-Gordo et al. 2019; Wesseling et al. 2020), resulting in early death for those affected. While initial studies occurred in the late 1990s and early 2000s (Trabanino et al. 2002), it wasn't until 2007 when I (Glaser) was making a documentary about the banana industry in Nicaragua that the issue began to gain international attention and resources were acquired for an integrated research strategy (Jimenez et

al. 2014). Protests had erupted in a nearby town decrying unprecedented levels of deaths among sugar cane workers at a local mill. Efforts to quell speculation by the local police, and subsequently the sugar mill's public relation firm (Burson Marsteller) created an impetus to coordinate with local academic researchers and a regional program with community and worker's health as the focus. With various partners, we founded La Isla Foundation which was later designated La Isla Network (LIN) and developed a research and advocacy organisation focused on addressing the needs of those affected with specific efforts aimed at preventative measures utilising the best available data.

How LIN Formed

When myself and the documentary team stumbled upon several young cane workers dying in sombre protest in hammocks in front of a sugar mill's company gates in 2007, we knew little of epidemiological statistics. I would certainly have struggled to explain what a confounder was, the fundamentals of logistic regression, or why it is important to designate exposures a priori and not dive into the sea of unresolvable biases that emerge from data dredges and research fishing expeditions. Today, the methodology of effective epidemiology and scientific investigation are thought of at LIN as tools, which have their limitations, applications and uses. They do not detract from fundamental and unrelenting realities of the exploitation inherent in commodities markets, the failures of development strategies that do not lift up the working poor but still manage to enrich their employers, or the banality of an international interconnected trade and development system that permits multiple permutations of abuse and brutality as part of nearly every relevant supply chain in the marketplace. Understanding dynamics while lacking the tools to assess and measure them makes for little more than angst and pontification. The film team, having been unimpressed by Jeffery Sach's (Sachs 2006) defence of the status quo were more inclined towards the assessment of development follies, particularly those relating to continued poor health and economic outcomes for those at the bottom of supply chains and social hierarchy, despite billions of investment. According to William Easterly (2007), this was in part driven by a lack of stakeholder engagement, and so I decided to inquire into who was working on the issue locally.

The team partnered with local advocates, who had helped to bring a complaint through the office of the Compliance Advisory Ombudsman (CAO) against the International Finance Corporation's investment in the sugar mill where so many young men had fallen ill, meaning the filmmakers connected with those suffering from the disease, families left behind, and local researchers who made up a network known as the Program for Worker Health and The Environment (SALTRA) operating through Central American Universities and funded by the Swedish government (Wesseling 2011). The early relationships with community members pursuing the CAO complaint, and the researchers looking into the issue were the foundation of LIN.

Mobilisation

The effort was energised by what several parties viewed as uninformed loan practices by the IFC and a subsequent CAO process that appeared to be a hand washing mechanism intended to clear the IFC's name from any responsibility for the identified kidney disease among workers. This dissatisfaction arose among local researchers, impacted community members and advocates driving them together to form what served as a critique of and counterweight to the official CAO process. Community leaders who through their local advocacy group, the Association of Chichigalpinos for Life (ASOCHIVIDA) had originally brought the complaint to the IFC now found themselves boxed out of the CAO process. The original ASOCHIVIDA leadership was pushed out by parties friendly to the company and convinced the CAO process would bring amelioration. In the case of researchers, a group from Boston University, most of whom did not speak Spanish and had limited experience in the field setting of Nicaragua, was chosen over local

researchers from SALTRA who had been working on the problem for years, due to claims by the sugar mill that local investigators would be biased. Community members that took part in the complaint were informed they would not get what they desired if the current ASOCHIVIDA board, which had advocated for and brought the original complaint, remained. Subsequently, they were replaced. The counsel from Washington DC's Centre for International and Environmental Law, which was representing the claimants, found such interference to be of little concern. Frustration built up and was compounded by policies like prohibiting claimants from participating in any non-mill sanctioned research, and pulling the provision of restitutions such as food stipends or housing from ASOCHIVIDA members who spoke to the press or engaged in independent research. Collectively, these actions drove a diverse group of actors together.

A pillar of the dissent to the CAO process centred around the dissatisfaction that little was done to improve the working conditions of those known to be at risk of CKDnt. The CAO's focus became almost entirely on those already ill or left behind by those who had succumbed. Both a precautionary principle-based intervention to improve current work practices, as well as aid and support, were needed but the CAO process only served the latter. Especially egregious was that aid arrived on the condition that recipients abided by the rules set by the CAO, the sugar mill and communicated to claimants by the new ASOCHIVIDA board.

The funding provided to Boston University to illuminate potential causes of CKD among the workforce was also entirely from the IFC or the company, with efforts to launder the money through a group known as the CDC Foundation (Lenzer 2015). This conflict of interest was repeatedly compounded by the deficit of timely pushback by BU researches when their work was misquoted and misused repeatedly by ISA or IFC.

The impact of CKDnt on the community, and the issues identified by LIN with the CAO process were eventually communicated to leading news outlets and reported on. This garnered interest from professors and students in the human rights issues highlighted, as well as the intrigue of a potentially addressable, but not well understood epidemic. It brought a large number of volunteers, interns and interested researchers to the issue. This amalgamation of community groups, researchers, and media helped to put the issue on the map, and provided focus through the lens of one community devastated by the disease.

Setting a Research Agenda; Building a Team

Listening to leadership and local researchers in affected communities, LIN began identifying what information was necessary to understand some of the upstream drivers that required amelioration, potential proximal causes that offered intervention opportunities, and provided some context for what this disease meant for people in terms of advocacy and associated economic considerations.

Due to limited resources we began with a local Knowledge Attitude and Practice study (KAP), and coordinated with researchers to carry out one of the earliest prevalence studies (Raines et al. 2014) which along with efforts from SALTRA (Torres et al. 2010; Peraza et al. 2012) later formed the basis for the standardised protocol that we developed to assess CKDnt globally, via **the Disadvantaged Populations eGFR Epidemiology Study (DEGREE)** (Caplin et al. 2017). Human rights and child labour reports ran in concert with these efforts, and as resources and risks were identified we began the first occupational cohort studies and interventions in the hope of mitigating identified risks, while exact causality was argued in the scientific literature. Utilising the data that built from simple cross-sectional to longitudinal research, we informed policy makers in the public and private spheres, where possible. This culminated in our thus far successful occupational health program, The Adelante Initiative.
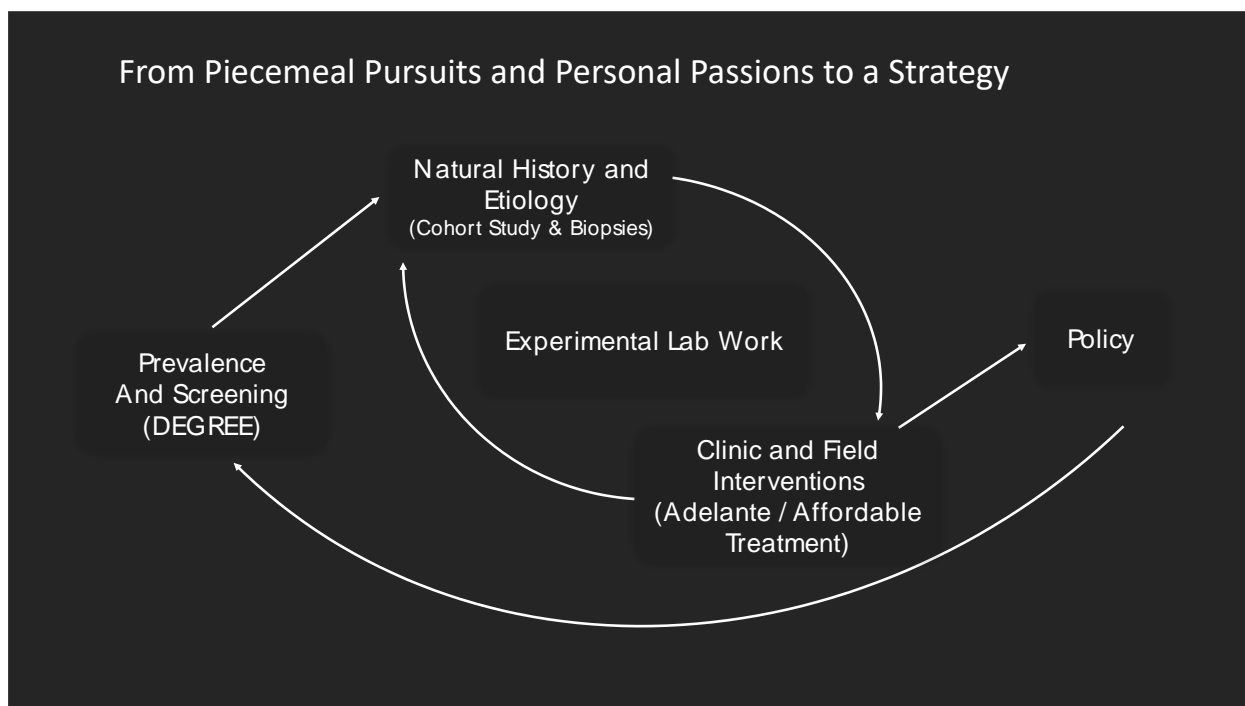
Figure 1: LIN conceptual framework of research strategy (2016).

Initially LIN wished to focus on the structural issues we felt, that if addressed, would render the proximal cause, or aetiology of the disease functionally irrelevant. If basic protections regarding heat stress, as well as toxin exposures were put in place – already mandated in regulatory systems across many countries – the incidence of the disease would plummet. Put simply, CKDnt does not happen among wealthy or middle classes or among management and supervisors living in the same towns or small cities where CKDnt exists. It specifically impacts the working poor, and those doing the most dangerous jobs. Consequently, we aimed to focus first on the context of the disease and the lived experience of those who were confronting it, and its devastation.

Economists, anthropologists, lawyers, and psychologists were of more interest than epidemiologists initially. However, aside from legal experts, the researchers who invested the time, and the energy needed to move publications and therefore credible data forward were a group of physiologists and epidemiologists. While this has been positive in the sense of understanding risks and where we might act in the fields to mitigate disease incidence, it has, until recently, left us with little in terms of understanding the true cost of the disease, economically, socially and otherwise. This has opened us up to academic quarrels over CKDnt aetiology which limits the ability to act on and improve working conditions that are already known to be dangerous, and contributing to the development and progression of CKDnt. Today we are finally incorporating the economists and anthropologists we believe would have helped frame the condition and provide insight early on.

Research Focus and Partial Reset

It was only by necessarily following the path of least resistance that we became part of the aetiology/causal debate by virtue of drawing on epidemiology and physiology. For LIN, causality has only been important in so much as it informs intervention. Meaning, we are most interested in mitigating identified and plausible risks that should be addressed anyhow. These include poor water quality, heat stress, dehydration, long working hours, and insufficient wages. By addressing

deficits in these categories, we hope to create conditions that allow a workforce to advocate for themselves on these issues and others.

Presently, we are most interested in data that can help us ascertain if an intervention reduces incidence of disease among a workforce, but also whether such efforts improve the economic stability and well-being of the affected population. Here we couple classic exposure assessment methods of epidemiology with socioeconomic questionnaires developed to assess the resilience overtime of stressed communities. Basically, this means providing a baseline that will allow for the assessment of community level and occupationally focused intervention efforts over time. This also provides us with, what is in effect, a partial reset and a return to our initial aims of addressing the context and upstream drivers in working with CKDnt. Today, with new research partners from the social sciences and humanities we can begin calculating the true burden of the disease on individuals, households, communities and how current political-economic conditions and other structural forces allow such phenomena to persist. With coordination of hospital and clinic data we can begin to paint the picture of what this disease means for health systems. With this data we can motivate an informed realignment in the development sector and pose the questions:

- How are development projects assessed for funding or financing?
- How is their success measured?
- What risk assessment processes can help improve current loan recipient practices and programs?
- How can we avoid missing issues like CKDnt?

The last question is especially relevant given that CKDnt appears to be one of the leading causes of death among those who constitute the working poor in the tropics and along the equator (Wesseling et al. 2020). In short, we question how sophisticated, well-funded development agencies can miss dire occupational and public health crises, and how they might be better positioned to sustainably address the risks and harms that consign people to lives of poverty. In parallel we are examining the structures in the private marketplace that allows such a condition to develop and persist.

While many papers assert that CKDnt is a new phenomenon, data from Costa Rica demonstrates it has been with us for some time. Costa Rica is one of the few affected countries with reliable routine data going back to the 1970s, and it is clear that CKDnt has been extant since the 1970s and is strongly correlated with the industrialisation of the sugar crop in its hottest and driest department, Guanacaste (Wesseling et al. 2015). This insight, brought about by epidemiologists assessing routine health and agronomy statistics, highlighted the need to integrate the history of agronomy in the region with climate data to lay the foundations for later Geographic Information Systems mapping that would help us understand the scope and primary exposures related to the disease (Hansson et al. 2021). Here we saw that as the industry moved away from small farms, operated by the farmers themselves, to a network of holdings worked by labourers, many of them migrants from Nicaragua, the incidence of mortality due to CKD increased as the land under sugarcane grew in hectacrage and was more intensively cultivated.
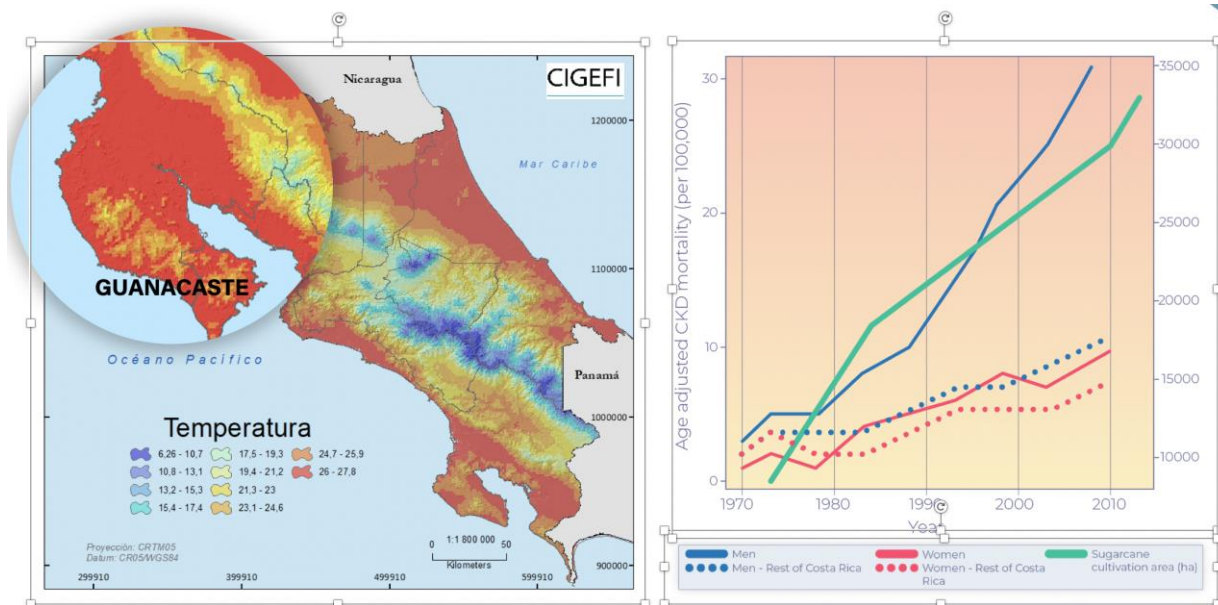
Figure 2: Costa Rica's NW province of Guanacaste is its hottest and driest, and home to an enormous intensification of sugarcane production that saw production move from small farmers working their land to larger holdings worked by labourers.

Strenuous manual work in extreme heat without sufficient rest and hydration is today considered a main driver for the epidemic in Central America (Glaser et al. 2016; Hansson et al. 2021; Glaser et al. 2020; Wesseling et al. 2020), where industrial agriculture is the most affected, especially the sugarcane sector (Hansson et al. 2019).
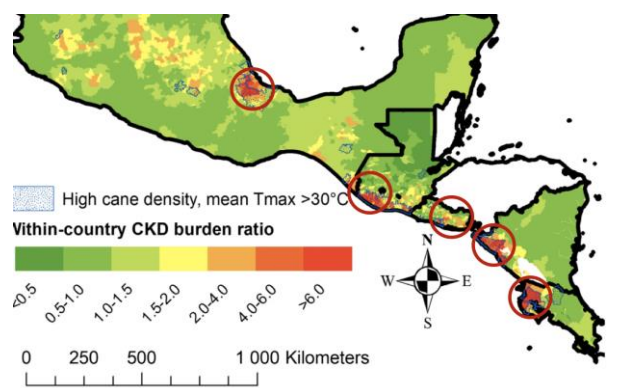

Figure 3: Intensive cane cultivation in hot lowlands is heavily associated with CKD burden in countries with reliable land use and patient data. Intensive cane in cool highlands, and low intensity cane in hot lowlands (both using pesticides) are not associated with CKD.

Case Study 2 – Reflections on the Conditions (as Distinct from Causes) of CKDnt Emergence around Lake Chapala, Mexico

The following case study – much less developed than the previous – emerged more recently in the context of conducting anthropological research on the political economy of kidney disease and healthcare in the state of Jalisco, west central Mexico (see Kierans 2019; Kierans and Padilla 2021). Colleagues and I (Kierans) noted that the patients we encountered at a public hospital for uninsured Mexicans in Guadalajara were presenting with a form(s) of kidney failure that did not

conform to established aetiologies for CKD more broadly. The patients in question had few symptoms even as their kidneys rapidly deteriorated and were comparatively younger than those presenting with more conventional forms of the condition. Many were told by their doctors they had *riñones chiquitos* (small kidneys) and as a result, were difficult to biopsy, analyse and diagnose.

As the condition was, and is, unexplained, one could not be sure it was the same as that encountered by Jason and colleagues in Central American sugar cane fields. To investigate, I led a small team of humanities and social science scholars working in dialogue with nephrologists and bioscientists. Having already established relations with affected patients, we decided to *follow* failed and failing kidneys from *clinic* back to *community*, specifically to the municipality of Poncitlán located on the northern shores of Lake Chapala, some 60 kilometres west of Guadalajara (Map 1). To date, no clinical nor epidemiological studies have been carried out in the municipality to characterise either the disease or the population suffering from it, however, data gathered from the public hospital in Guadalajara indicate that local children under 18 are 10 times more likely to experience kidney failure than the state average, with adults 4 times more likely (Garcia-Garcia et al. 2019). What is known is that high levels of the biomarker proteinuria, present in many in early stages of the disease in the Chapala area, are absent in the Nicaraguan population affected until much later. Our approach, in many respects, reflects a similar impetus found in Jason's work, i.e., to ask what is already known and to move forward with respect to available expertise, existing research and local relations. In our case, we started with a different constituency of disciplines – social science and humanities in the main – supported by clinical medicine and epidemiology. Our approach was thus driven by disciplinary and transdisciplinary expedience and serendipity (Ginzburg 1979).

Map 1: Municipality of Poncitclán (Mezcal, San Pedro Itzicán and Agua Caliente).

Poncitlán is home to 53,000 people, distributed among variably marginalised small towns and villages. They can be considered places of neglect and displacement; the consequence of colonial,

post-revolutionary, neo-liberal and neo-colonial histories. Those who live there – mestizo and indigenous – are part of Mexico's growing precariat reliant on the informal economy as contract labourers with local transnational agri-companies; as construction workers on building projects in nearby Guadalajara; as labourers on local farms or within the fishing industry, as domestic cleaners in nearby towns, and as subsistence cultivators of crops, primarily corn and chayote grown on their own small landholdings or gardens. As a potential occupational cohort, they do not easily map onto LIN's sugar cane cutters, but are, instead, constituted by fractured and overlapping modes of labour, shared histories of dispossession, exclusion and neglect, borne out by their health and the impoverished conditions of their lived environments.

In the absence of formal epistemic accounts of the unprecedented rise of CKDnt, our immediate priority was to empirically follow the condition by staying close to the "actors" themselves; documenting the condition as a vernacular concern, attending to their experiences and explanations and the everyday environmental encounters these experiences point to. Nonetheless, our methodological orientation was, to some extent, modulated by what was already known about CKDnt in other parts of the world, chiefly via LIN's work and also our own interdisciplinary sensitivities to health-environmental relations as slow moving effects (Nixon 2011). We, therefore, considered that present day articulations of CKDnt may well reflect prior pathologies (social, ecological and embodied). Our goal, however, was never to establish causal links but to examine the context and conditions of disease emergence and to consider the auxiliary elements – structural and infrastructural – where interventions might best or better be served, particularly in a context where access to healthcare for uninsured Mexicans was already profoundly problematic (Photo 2) (Kierans 2019).

Photo 2: On home dialysis in Agua Caliente. Lucero died of CKDnt, aged 22. Multiple members of her family have also been diagnosed with the condition. [Photo taken by Cesar Padilla-Altamira]

The methodological approach we mobilised was anthro-historical in character, and in dialogue with local clinical and bioscientific insights. We, therefore, intertwined three already closely aligned investigative approaches via a suite of pilot projects, publications from which are currently in process:

1. Ethnographic: to resituate CKDnt into its community settings, attending to the interrelations between livelihood (domestic; subsistence and waged), environment and health. 12 family cases were entry points and soon progressed to include others with a stake in the condition: family, friends and neighbours; health professionals; environmental activists; politicians, among others. With them, we mapped CKDnt emergence across a twenty-year period from 2000 to 2020 (Kierans and Padilla 2021).
2. Genealogical: a social history approach extended and expanded on issues raised in the ethnographic cases to produce inter-generational narrative accounts of CKDu emergence, in conjunction with social, political-economic and environmental change.
3. Historical Archival: health-environment relations were then followed back in time as functions of climate change, land use and water management.

As is the case with anthropologically anchored research more generally, our investigative approach is promiscuous, flexible, ethically reflexive and always empirically anchored. It was not about data collection as one-off moves (i.e., via discrete and bounded methods) but continual back and forth iterations that enabled relations to be traced between a locality, human experience and wider historical, environmental and structural processes. Despite the uncertainties that plague CKDnt as an epistemic and categorical problem, locals had little difficulty pointing out where they understood problems to lie – within *non traditional* origins, ultimately generating antinormative modes of reasoning. Sickness – far from the distinct entity amenable to clinical and bioscientific forms of reasoning it can be held up as being – is embedded in local forms of living and the relationships they hold between humans and more-than-human environments (Tsing et al. 2017). In other words, local interlocutors documented a catalogue of concerns bound to a wide range of exposures and infrastructural failures that profoundly shape livelihood and the practices of everyday living. They include, *inter alia* – widespread contaminations linked to: local wells used for everyday consumption; aquifers and hot springs used to bathe and wash utensils and clothes in (Photo 3); corroding pipes that carry local domestic water supplies; inadequate sewage and sanitation infrastructures; contaminated fish that are routinely caught and eaten; poorly irrigated soil for subsistence agriculture; the widespread use of unregulated agro-chemicals, which drain back into the hydrosocial cycles and also the complex shifting character of agri-work (made possible by extensive agrochemical use) which has facilitated synchronous work across both subsistence and industrial forms of agriculture – multiplying efforts and all manner of exposures. Each of these concerns constitute the threads we follow. In turn, they delimit the relations between failing health and failing environments opening up a space to rethink interventions as ways to mitigate structural and infrastructural harms. They demonstrate the range of risks, which have to be tackled, to promote safe, secure, healthy lives, out of which the emergence of CKDu is but one of many concerns. Our experience of this investigation has taught us that rather than put health problems (of which there are many) into direct competition with each other, as problems that independently require their own discrete causal modes of investigation and response, we ought to orient towards shared, in-common, interventions to produce the kinds of effects that may well have farther reaching consequences. Of course, this does not exclude the quest for discrete causality; it simply challenges its privilege, while recognising that kidneys do not stand alone. We should, therefore, exercise caution in affording primacy to discrete disease categories (Livingston 2019).

Photo 3: Washing clothes, Aqua Caliente. [Photo taken by Ciara Kierans]

To provide brief context to these threads and conditions: Chapala is Mexico's largest freshwater lake and one of the most endangered and polluted water systems in Latin America. It connects outwards to the heavily industrialised Mexican plateau via the Lerma River basin on one side, and on the other, to the Pacific via the Río Grande de Santiago. Industrial dumping, inadequate waste-water treatment, and intensive irrigation for farming have been implicated in the rising concentrations of contaminants in the lake and consumed through drinking water and eating fish (Trasande et al. 2010; Stong et al. 2013. Approximately 20 million people, live in the catchment area around the lake, all dependent on it for water, sanitation and land irrigation. When the first cases emerged in the early 2000s, the water levels of the lake were at their second lowest levels in history. Untreated waste discharged all along the Lerma basin. Environmental scientists raised concerns about heavy metal and pesticide accumulations and concentrations of lead, copper and mercury were reported in the muscles and liver tissue of fish. Fish stocks have rapidly decreased and the native species of catfish and pescado blanco, once a staple of local diets have all but disappeared. Stocks of charal and lamprey have also diminished. Carp, still widely eaten, is known to be contaminated by methylmercury and is the source of ongoing local controversy.

When the lake recovered, it flooded a newly constructed sewage treatment plant (Photo 4) – washing its contents up on to the shores of the Poncitlán villages – adding inadequate sewage treatment to the spaces of neglect and concern and multiplying problems with water. Household water supplies which draw from ground water aquifers and surface water via the lake have fared no better. The water is neither treated, nor cooled. It is intermittent and unreliable. It runs through pipes which corrode and break. For those houses connected to volcanic springs, it arrives hot into their homes. For those that can afford them, they purchase 20 litre plastic water *garrafones*; for those that cannot afford them, they use the local water supply. Concerns about health and water safety are perennial but severely neglected. The provision of local plastic water containers is unregulated.

Both tap and bottled water show contamination by coliform bacteria, including E. coli, fecal matter and arsenic (Smith et al. 2020).

Photo 4: Sewage reception tank and sump pump, San Pedro Itzicán. [Photo taken by Cesar Padilla-Altamira]

Uneven irrigation, climate change and the political economic consequences of NAFTA have increased reliance on a wide array of agrochemicals. Poorly regulated, mixed with little instruction and sprayed without protection by all, young and old, agrochemicals are the source of increasing concern with regard to ingestion, agri-run off back into the lake and in terms of food quality and safety. The widespread use of agrichemicals have lessened the time spent labouring outdoors in small-holdings, only to intensify labour across multiple employment sectors: construction sites, factory work and industrialised berry fields; pluralising occupational health concerns. CKDnt, furthermore, emerges in the contexts of comorbidities whose interactions are little known, though of significance. They include *inter alia,* malnutrition, congenital physical malformations, poor cognitive development, cancers, diabetes, chronic diarrhoea, the effects of violence, alcoholism and occupational harms, reinforcing the importance of interventions which elaborate structural and infrastructural conditions, rather than merely discrete causes.

Conclusion: Companion Methods and the Challenge of Hybridisation

That CKDnt has surfaced at the beginning of a new millennium at the margins of workplace and environmental harms suggests we need new ways of approaching novel health crises across global sites and settings. The above case studies have offered insights to doing so via our particular hybridising investigative methods as well as through explaining how such methods are made in

situ. In what follows, we reflect on some of the lessons we have learned as we begin to draw our lines of inquiry together. While the contexts, environments, pathophysiology and therefore precise aetiological elements may differ between the kidney diseases in Chapala and throughout the monoculture dominated lowlands in other parts of Mesoamerica, they share important similarities. Those who are affected are in precarious economic circumstances and unable to access treatment or readily advocate on behalf of themselves or their communities.

Context

Context matters. Descriptions of context – social, political-economic, environmental and historical – are critical to understanding and acting on CKDnt. This is achieved largely through ethnographic sensibilities, attributed to what the anthropologist Anna Tsing (2015) refers to as "acts of noticing" – i.e., attending to more than circumscribed lines of inquiry, by being open and amenable to new questions and directions, iterations and feedback loops. Situating CKDnt in context is impossible to accomplish from a unitary disciplinary perspective; it necessitates a "collaboration of hands" (Goffman 1979). This also enables concerns of relevance to arise for other modes of disciplinary inquiry – from toxicology to nephrology to structural engineering and ecology, in addition to the work of anthropologists, historians, economists, epidemiologists and so on. In other words, attending to context prepares the bioethnographic ground of and for collaboration without prescribing in advance how they ought to fit together.

With regard to case study one, contextualised approaches help ascertain what environmental and occupational exposures merit investigation, ideally eliminating the tendency for epidemiological and medical specialists to merely *apply* their disciplines, specific specialities, and interests to new puzzles. They help curb the proximal exposures traditionally the domain of medical and epidemiological research methods and with that the decontextualised consignment of complicated pathophysiology to discrete *causal* determinants. The search for discrete determinants too often become the focus of protracted research and years of inquiry and debate before consensus is reached and subsequent action is taken. There is much to be said in favour of elaborating the conditions – as distinct from merely the causes – not only to link so called "down-stream" effects to "upstream" structural mechanisms but importantly to "midstream" intervening and mediating concerns (Yates-Doerr 2020), particularly those that shape everyday engagements between human populations and their environments (ecological, social, political-economic and cultural). Investigating structural and infrastructural mechanisms moves us beyond a strict biomedicalisation of disease to incorporate sustainable forms of intervention and prevention, e.g., improving work practices through policy and implementation reform; the provision of clean water and sanitation; access to health services and welfare – all critical to eliminating or reducing proximal exposures and ensuring protections and prevention for at-risk populations. If such efforts eliminate the outcome, then the precise pathophysiology of a disease remaining unknown is a modest trade for the health of impacted populations. Elaborations of context allow for alignments and collaboration with affected populations to set the framework for aid and ameliorations while causal processes are further investigated. They also create space for economic methods, among others, to provide significant baselines from which the success of later interventions can be measured, often well before they get off the ground. In the context of case-study one, proceeding thus, would provide not only much needed data, but opportunities for analytical comprehensiveness. For case study two, the capacity to work in collaboration with epidemiologists and bioscientists provides a significant pathophysiological and population-base to anchor and elaborate social, cultural and historical insight.

Drawing both case studies together, we advocate for a dialogical investigative approach, one which requires iterative feedback loops to be an essential part of project building and may, depending on

circumstances, require a mix of phased and synchronous methods, for example, it may be pertinent to establish the context in which a health crisis is occurring prior to integrating models of epidemiological, environmental and social research.

Epistemic Cultures

We recognise what we propose is not straightforward, and that efforts to hybridise inquiry have ontological and epistemological implications. Such efforts produce all manner of challenges for epistemic cultures. Our case studies have taught us much about where the pitfalls of investigative processes lie, particularly when approaches are overdetermined by methods that produce results, which are themselves artefacts of those methods, professional vision or indeed ambition. While we have been careful to not fall into a trap of setting out to prove what we already believe, the tendency to apply specific expertise and held beliefs to a new problem have permeated much of CKDnt research in Mesoamerica. Hybridisation, as we see it, in no-way dissolves disciplinary expertise and insight, but puts bias and bedrock assumptions on the table, such that investigations are driven by the nature of the problem in question (rather than methodological conflict and competition) – and with the needs of affected communities to the forefront – avoiding as Jason refers to in Case Study 1, attempts to force a square peg into a circular hole.

While many causes have been proposed for the wider pandemic as well as local epidemics of unexplained or non-traditional CKD, they have not emerged due to a process of methodological pluralism, but due to the efforts of experts in different disciplines and specialties applying their own entrenched expertise to perceived and/or actual holes in the puzzle. Instead of looking at the pieces surrounding that hole and evaluating what piece or approach may best fit the situation, the approaches to-date have frequently been ad hoc and dependent on a principal investigator's former successes or interests. Differing opinions have led to contentious and unproductive exchanges leading to dysfunction in the research community instead of collaborative action, potentially adversely affecting the populations and impacting the pace of policy change and intervention efforts that could mitigate identified risks such as heat stress or dangerous toxins. This is wasteful. It entrenches beliefs and biased unthinking, creating "tribes" that attack each other in the pursuit of limited funding resources and ensuring disagreement will never be worked out in academic journals or conferences.

Meanwhile, the populations who require clarity of thinking, collaboration, informed investigative methodology and precautionary principle-based interventions are left as subjects, not participants, in research too often carried out by elite researchers, be they local or foreign.

Investigating novel diseases at society-environment intersections requires a paradigm shift. Here we echo already existing conversations held, *inter alia*: by social scientists in challenging the privileged status of the lone worker ethnographer in deference to wider ethnographic alignments (Tsing et al. 2017; Boyer and Marcus 2020); by critical epidemiologists who challenge discrete causal processes in favour of a focus on mechanisms, processes and relationality (Krieger 2011; Breilh 2021); by science and technology scholars challenging the implications of hierarchical, extractivist research, rarely aligned with community interest and with little capacity to exact sustainable change (Liboiron 2021). We critically need, therefore, to recognise and account for the politics of evidence and the capacity to handle and work with multiple truths.

Collaboration

Hybridised investigative methods are by necessity and design collaborative and this can and does mean multiple things to multiple people and sometimes all at once. Positively, it can offer novelty

and innovation: opportunities to provide new ways of representing old problems, generating bold new kinds of research; new information infrastructures that yield new ways of writing and dissemination; the capacity to generate new kinds of conceptual and analytical work (Boyer and Marcus 2020). Perhaps cynically, there is always the danger of simply putting old wine in new bottles, particularly if hierarchies of evidence and control of research processes remain intact, and where socially focused disciplines remain as under-labourers to the bio and health sciences, ostensibly where the status quo remains unscathed (Adams 2016). Hybridised investigative inquiry ought to reflect the nature and character of the partnerships they mean to connect and pull together and so, we cannot be overly prescriptive here. Our efforts to draw together the approaches reflected in the above case studies are in their infancy and in progress. Our commitment, however, is to generate research methods that are flexible and promiscuous, that seek to keep lines of inquiry open rather than shut them down in advance. Our objective is to minimise the kinds of erasures that can mask the emergence of novel forms of disease and harm. Doing so rests on other values that we have also learned the benefit of while doing: trust, transparency and intellectual curiosity.

Adaptive and Comparable Methodologies

Reports emerging from SE Asia, South America, the USA, West and Northern Africa show that what was once thought to be a localised epidemic is in fact a pandemic affecting a large percentage of the global precariat. While other aetiologies aside from heat stress have been posited, epidemiological evidence is absent for most, if not all of them. Heat stress has been shown to be an exposure with a well described and supported pathophysiology as well as the possibility of successful intervention efforts. Without improved preventative efforts through occupational safety and health and wider public health and healthcare interventions, the pandemic is likely to accelerate due to climate change. Increasing temperatures, for example, put more workers at risk of exertional heat stroke and subsequent acute kidney injury, therefore predisposing many to developing chronic kidney disease. However, other exposures should also be assessed, especially with ongoing environmental degradation due to industry and extractive capital, decreasing precipitation in drier agricultural regions, and use of pesticides and other toxins, which concentrate at higher levels in the environment.

This raises issues regarding the possibilities for scaling investigative efforts and how we might reconcile problems which are simultaneously local and global in character. As our research moves to encompass CKDnt as a multi-sited global concern – by examing the actually existing possibilities for comparability, particularly in the context of heat stress driven kidney disease – holding true that many populations may simultaneously or independently be affected by other risk factors is critical. We therefore need to consider toxin related environmental degradation which could lead to localised epidemics of CKDnt, as well as the CKD pandemic related to metabolic syndrome. Given that toxin exposures and preexisting metabolic syndrome are likely to interact with heat stress and subsequent dehydration, it is essential that we reconcile such interactions as a potential feature of the condition. In our view, they *should not drive polarisation between proposed aetiologies*. One approach to describing the differences and similarities among kidney diseases affecting disadvantaged communities lie in the development of comparable protocols:

The ongoing Disadvantaged Populations eGFR Epidemiology Study (DEGREE) (Caplin et al. 2017) provides one such basis for creating an integrated and transdisciplinary set of protocols, that draw from the disciplines across epidemiology, physiology, climatology, the medical specialties, to further include the social sciences and humanities. In doing so, we can identify commonalities and differences in the different permutations of unexplained kidney diseases affecting vulnerable communities. By including the socioeconomic context, lacking in current efforts, we would allow

future investigations into kidney disease among disadvantaged communities to provide insight as opposed to the confusion and conflict that erupts when methodological approaches are disparate. Such efforts would allow for improved understandings of CKDnt driven by heat stress in areas recognised as affected and where it is suspected. Equally importantly it would identify and contextualise several forms of kidney disease, and their potential interaction with one another, be they due to heat stress, traditional metabolic drivers, or specific toxic or infectious agents, affecting the precariat in low resource settings.

Proceeding thus, local and global scales operate as guides to each other's respective concerns – continually linking effect and affect to different mechanisms and processes (if not necessarily causes). The global is directly encountered and embodied via the local, something clearly illustrated by sugar cane cutters intimate connection with global capital or climate change or indeed the Lake Chapala residents encounter with colonial and neo-colonial forms of neglect.

How to Think Prevention in an Unequal World?

Our goal is to create aligned and adaptive investigative research processes that put the needs of the participant population first, and focuses on addressing the risks, if not outright causes, related to their concerns. We hope that such processes would inform precautionary principle-based interventions in the community and occupational setting, produce information for advocacy for access to care and requisite treatment and contribute to translational work that empowers those affected to advocate for themselves. In other words research processes ought to emerge through a genuine effort to "people critique" – to ensure a "conscientious empiricism is wedded to a radical analytical openness" (Biehl and Locke 2017). It is therefore essential that research in disadvantaged and neglected communities is non-extractivistist in character particularly when access to the human body and its practices are at the forefront of inquiry. Genuine forms of local partnership and collaboration are not simply desirable, but critical to meeting the kinds of challenges that CKDnt poses as well as calling into question who has the power to make a disease.

Acknowledgements

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