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Research in fractured digital spaces

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Abstract:

The internet is a medium for research, a place for the exchange of drugs and knowledge, and a method for governing and surveilling drug users. Opportunities for drug research with and in digital spaces are expanding, using internet mediated methods such as online surveys, web scraping, and research with online communities such as users of cryptomarkets and apps. As the sphere of social data grows, so does the degree to which the data itself is a product of fractured, governed, privatised set of spaces. Research often has to work with these structural aspects and researchers have to be aware of the structural mediation of their data. The opportunities for research also demand that researchers consider the validity of traditional scientific hierarchies such as the assumed superiority of probability sampling, and parse the naturally occurring taxonomies that are produced by the systems they research. A positive development has been the growth of internet focused researchers who operate in and outwith the academy and who are creating an independent research infrastructure with potential for a democratic research politics.

Article:

Arranging drug deals by the darknet cryptomarkets, via Instagram, Grindr or WeChat, or through Gumtree, are processes involving buyers and users in platforms with very different capabilities and risks (Barratt and Aldridge, 2016; Aldridge and Askew, 2017; Yang and Luo, 2017). Digital platforms allow for the often rapid production of massive data and invite the production of new methods such as virtual ethnography, crowdsourcing, web scraping, data mining or digital trace analysis (Aldridge and Décary-Hétu, 2016; Giommoni and Gunder, 2018). They invite new social research capacities such as the production of near real time metrics and rapid intervention analysis (Horton-Eddison and Cristofaro, 2017), which can support research with hard to reach groups who wish to remain anonymous (Coomber, 1997a). They are also new sites for surveillance and policing of users and dealers, and attempts to regulate the flow of information about illicit activity (Ladegaard, 2018).

The contrast between the internet as affirming and recreating existing institutional and power structures, and freeing participants from them, is explored by Barrat et al. (2013). They account for the potential of digital services for information exchange by drug users and the limits on that which come from platform providers and state authorities. Drug user forums, threads and instant messaging services can be sites for challenges to expertise and expert authority where users can develop and disseminate shared understandings of drugs and drug use practices (Boyer et al., 2007). In contrast to the often restricted flow of information in localised drug markets, users can share and compare across a much greater range of substances and user-experiences (Walsh, 2011). They also may find these avenues closed off due to expanding internet regulation. In the case of Australia, as service providers can be compelled by the Australian Communications and

Media Authority to block sites hosting instructions on illicit drug use, which could in theory mean users could not access harm reduction information hosted on sites like Pillreports and Bluelight. That has not come to pass, thought it remains a possibility. There is a growing body of regulatory practice which compels platforms and service providers to regulate who uses their services and what they contain. For example, the UK Digital Economy Act 2017 compelled pornography hosting sites to introduce age verification checks for UK based users on the grounds of protecting children from adult content. The provisions are expected to come into force in 2019. That precedent could be used in other ways, for instance to restrict who accesses places where safer injecting practice is discussed. Requiring personal identification is also a barrier to access because it can make users reluctant to identify themselves. It also contributes to the digital divide by only permitting those who have verifiable ID to make use of some sites (Gangadharan, 2017).

Everything is happening on someone else's computer. Conceptually there is no such thing as 'the internet' understood as a single, globalised, flat open virtual space. In part it is a digital extension of other institutions such as the mass media, states, corporations, education systems and others, looping from the open web to the internet of things (Sadowski and Pasquale, 2015). There is a range of technologies, social systems and cultural patterns that work through infrastructures and platforms that are sometimes shared and sometimes distinct or incompatible. The fractured internet creates and distributes visibility and invisibility (Bucher, 2012), and varied accessibilty. Citizens around the world can have access to parts of the 'splinternet' and to various services blocked or redirected by private or state geo-locking (Ananthaswamy, 2011). In China much online communication and commerce takes place through the WeChat platform, easily exposing drug users to police surveillance (Qiang, 2019). Responding to the enforced lack of privacy of the modern internet are new privacy focused communities and philosophies (Lewis, 2017). Technological solutions will not be supportable by themselves. They require meaningful communities of practice to support them (Dodd, 2018). There were expectations that the Tor darknet would mean the emergence of sites unreachable by government censorship. These sites are often impermanent due to shaky hosting infrastructure and fractious relationships between administrators and rivals (Bancroft and Scott Reid, 2017). Drug users have to reformulate and recreate communities when the underlying infrastructure provides to be be impermanent. That became apparent when Reddit closed down darknet discussion threads in 2018 in response to growing pressure on platforms to be responsible for user discussions of illegal activity.

As well as digital environments being a location for data collection and recruitment they constitute a set of spaces that produce and reinforce subject and researcher sensibilities. There are two ways this works. In ontological terms, digital methods integrate user, dealer and researcher identities into a machine assemblage (Fox and Alldred, 2015). Human agency is shaped and constructed by software, hardware, communication platforms, data commodification, algorithmic assessments of individuals and internet regulation and oversight (Noble, 2018). Drugs flow through platforms, as much as markets (Dittus, Wriught and Graham, 2017) meaning a more rapid responsiveness to consumer signals, and innovation in drug types and forms (Gilbert and Dasgupta, 2017). In epistemological terms there are extensive hidden process and effects. For example, web scraping

is now a widespread method used by researchers, marketers and law enforcement agencies, which can collected very large amounts of near real time data (Marres and Weltevrede, 2013). It can give the appearance of completeness rather than the reality. Twitter's public APIs deliver up 1% of the Twitter stream unless the researcher has access to the main 'firehose' which usually has to be paid for and conducted under the governance of Twitter (Morstatter et al., 2013). Which 1% the researcher sees is up to the platform algorithms. A complete dataset is also often unmanageable, requiring excessive amounts of human and computational labour to process (Smith et al., 2017). On the one hand digital methods allow a much greater scale and reach of method. On the other researchers fear drowning in the theory-less big data swamp. Yet alongside these methodological and theoretical challenges researchers have developed methods which tell us much more about drug use than would be possible otherwise, and build new research norms around open participation where drug users and others take a role in defining what is said for and about them (Barratt and Lenton, 2010).

Questioning scientific hierarchies

The production of massive sets of naturally occurring data, and the growing informational savvy of drug user communities lead us to question the classical hierarchies of social science. One is the value of particular kinds of data, the other is who is producing and declaiming on knowledge. To take the first, Barratt et al (2017a) assess the automatic assignment of non-probability survey research to a lower place in the social science pecking order and the valorisation of randomness in the sample. They use the example of the Global Drug Survey (GDS), it is an annual global online distributed non-probability survey (Winstock et al, 2018). It is particularly oriented to non-treatment drug users. It provides relatively fast results which are of use to the drug using population. There is a high degree of buy-in from drug using populations which makes GDS something of an annual event. Population surveys have biases stemming from low response rates and invisible self selection, which it takes effort to correct, if at all possible. There is a declining response to traditional methods which challenges how meaningful and representative population datasets are (Czajka and Beyler, 2016).

The online survey works well when it both addresses and affirms a public of interested research users as much as a population. The Global Cannabis Cultivation Research Consortium's survey of domestic cannabis growers worked in this way. Researchers made themselves available to potential respondents on drug related forums, answering questions about anonymity, the purpose of the study, and its potential uses in relation to prohibition reform (Barratt et al., 2017b). Potential participants had varied responses, some sceptical, some positive about the need for reliable knowledge about cannabis growing. The researchers noted the value of a proven track record of past research to point to in order to themselves as independent.

The second issue is the politics of knowledge production. Online methods can give us a model for democratic ownership of the research process and findings. But it also means we have to consider whether we should operate with a gold standard of research and what that might be. Basing informed consent in a discussion about the purpose of the research widens the conversation about research and expertise, where the research population is invited to be part of a dialogue

about their experiences and practices (Decorte et al., 2019). One aspect is practical. Many online research projects can be conducted at a lower cost than household surveys so can be relatively independent of governments and state funding bodies. They then do not have to make the same performative claims about 'the problem'. That is useful when dealing with a politically controversial or stigmatised topic where the temptation for political interference is irresistible and where research becomes part of a policy political economy (Stevens, 2010). Originally, population surveys were derived from a governing idea that the human population needs to be marshalled and managed, and an epidemiological idea about contagion and disease spread (Curtis, 2002). Online methods can allow for egalitarian understandings of expertise and knowledge to be developed.

There is still a baseline assumption about what a normal population looks like which is static and that is becoming dated in a world of high immigration, precarious employment and mobility. It also means we have a built in assumption about what normality is, usually settled and middle class. This is particularly a problem with drug users where there are large hidden populations. On the other hand, online methods are biased towards those who are able and wiling to participate in the digital environment. There is then a continued role for traditional survey and other face to face methods due to the digital divide which limits the participation of many groups in the population, and the way in which digital platforms produce, distort and select data to their own or their owners' ends.

New data types and combinations

One of the opportunities digital methods make easier is the way that different data types can be usefully correlated and triangulated. Forensic methods can be correlated with cryptomarket data using chemical testing of a sample of products (Caudevilla et al., 2016; Rhumorbarbe et al, 2016). It allows researchers to assess whether claims made about drug quality are accurate and whether vendors and buyers have a good sense of what they are exchanging. Doing so punctures some myths held with equal fervour by buyers, sellers and the public (Coomber, 1997b). Researchers can use the data infrastructure to combine objective and interpretive data. In many of these environments users are doing the exact same thing, testing products and posting their findings for others to read and also discussing ontological questions about the boundaries of different drug categories (Orsolini et al., 2015).

A question posed by the use of digital methods is whether different forms of digital data map onto or challenge traditional social science taxonomies and concepts of what data is. Drug user discussions that take place online can be modelled using automated natural language processing (Cameron et al., 2013). However data can be highly idiomatic as in the use of emojis to represent drugs by dealers who use apps (Moyle et al, 2019). Apps allow for 'visual' dealing and displays of quality, whereas researchers may be used to textual or numerical analysis and the tools used are adapted to that. Even there we cannot assume a fixed meaning to textual data. Language changes quickly and online groups may develop fast changing insider terminologies.

Naturally occurring taxonomies may be handy, or they may be misleading. Mobile apps have clear attractions for drug users and dealers, being immediately available in communication platforms that users will be using anyway (Thanki and Frederick, 2016). They do not have the technical barriers of cryptomarkets nor the risks and learning curve required when using cryptocurrencies. App use is a case where the platform invites new behaviours. Apps like Snapchat allow dealers to spamvertise products by searching for threads discussing drugs and posting in them. As in other settings, the platform my be designed to inflate numbers regarding usage and throughput. Extensive effort must be put into de-duplication and data cleaning (Boyd and Crawford, 2011). Data inflation is not just data noise, it tells us about the motives of platform designers and administrators and the problems encountered by users who like us are trying to identify signal from noise.

Aldridge and Décary-Hétu (2014, 2016) examined the language Silk Road cryptomarket vendors were using and noted their presentation and pricing was characteristic of people expecting to sell in large quantities to other dealers. They note that drugs sold tend to be the 'recreational' ones (cannabis, psychedelics and MDMA) rather than the 'chaotic' ones (heroin, meth, crack) and posit some reasons why that might be. One is that Silk Road evolved from a skilled, recreational, retail market and did not pick up these buyers. Another is that many vendors of crack and meth are also producers so they may buy precursors such as powder cocaine online to cook up into their final product. By studying the amounts typically sold in each transaction, the authors were able to make claims about is closely the length of the supply chain. Synthetic drugs and cannabis which can be usually manufactured locally were those most likely to be available wholesale. Cocaine and opiate derived drugs have longer supply chains with more steps in manufacture. Cryptomarkets cannot support the lab/hydroponic garden to dealer supply chain represented by the ecstasy/cannabis supply chain and so were sold in smaller quantities. That indicated the cryptomarket was being used by middle level drug dealers to supply opiate consumers.

The analysis is effective because infers the relationship rather than assumes that bulk sales exist beyond a particular threshold. Dealers are going to be asking about specifics and vendors will present their listings in ways that reflect the needs of dealers. In addition there was a large drug precusor market on Silk Road. They noted that many bulk listings were likely to be private listings so not available to them so there is an incalculable dark figure that cannot be assessed just from the public data. So the categories set by the market administrators and understood by the vendors might not be the ones we want to use and we do not want to rely on their decision making nous either. However as data, indigenous categories can signify a great deal. Some drugs are sold in terms of 'doses' while others such as fentanyl can be and are sold to be re-dosed. Fentanyl is potent so a 'bulk' purchase might be relatively small.

In data scraping there is a standard technical structure (what, how often, how much, how extensive) and a theoretical structure (does it match the platform's structure or our analytical structure?) . It leads to technical and epistemological questions such as whether we use site metadata our impose our own metadata structuring using timestamps, location data, and other

meta data markers. Making sense of the large amounts of data involved need us to make scaleable tools to interpret it and those involve design choices.

Ethics and politics in the data infrastructure

Illicit drug research faces boundaries of politics and legality (Sandberg and Copes, 2013). Some methods such as collecting forensic and market data are only possible in jurisdictions which allow for research exemptions to drug prohibition. There are other changes that have happened in the politics online research such as the fall and rise of the gatekeepers. Given the amount of public data, researchers involve user communities much more easily without needing the nod from trusted insiders. Instead we have the invisible gatekeepers, Twitter editors, algorithms, forum moderators and reCaptchas which inhibit scraping. It is an interdependent research infrastructure. We are pulling at the same algorithmically constituted threads, hence the need for some research which is wholly independent of the platforms being studied. More positively there are many non-academic researchers who produce and share a vast amount of data and insight (Branwen, 2015; Lewis 2017), part of a process where social science is less and less the property of a professional class.

There is a growing problem of access. One of the benefits of online methods is that we can research anonymously and that respondents have a greater capacity to set the terms of their engagement in research. People seek anonymity to protect from stigmatisation and criminalisation, but on the other hand anonymity may not be as secure as they think. Barratt (2011) makes a distinction between technical and social anonymity. The former is less secure than assumed due to the qualities of social media platforms, the Bitcoin blockchain, and the growing capacity of analysts to fingerprint and link individuals.

The ability to gather data unobtrusively is a benefit and a temptation. Researchers may be working with dichotomies of public and private, identifiable and anonymous, consent and refusal that do not transfer well to in digital settings (Chiauzzi and Wicks, 2019). It might mean taking advantage of users' assumptions about the kind of protection the digital infrastructure offers their privacy, which is in practice very little. Social media data may be accessible, but that does not mean users think of it as public property for researchers to mine at will (Williams, Burnap and Sloan. 2017). De-anonymising is easily done, deliberately or accidentally. A range of stakeholders have to be considered, from big platforms to small community groupings and private site owners. Meaningful involvement takes time for the researchers to become known and accepted. Some steps can be taken protect people who participate in online forums from identification through searches, paraphrasing the quotes from them at the risk of losing some felicity (Aldridge and Askew, 2017). The principle is that the users' pseudonymous identities should be protected along with their real ones.

That brings us to a new concept of what subject identity is and what should be protected - including their pseudonymous online profiles, which are also of value and meaning to them. That also leads me to question some of the normative assumptions about who and what the research subject is. For example, when collecting data through interviews we assume that people are

primarily interacting in a conversational, question and answer world, or see that as the primary mode of interacting. In digital environments, people may interact sporadically over a longer period of time but see it as part of the same conversation, while they conduct many other interactions with others. Conversations can last days, with long breaks as the interviewee engages in other activity (Barratt, 2012). The baseline assumption in social research about continuous person to person interaction as the defining mode of interaction does not necessarily hold, particularly when many digital interactions are person to machine, or machine to machine. Much internet traffic is non-human, to the point where it is the human which stands out as suspicious (Read, 2018).

End of the online

The once hoped for model of cyberspace as a separate entity governed by its own democratically decided rules is now looked back on as hopelessly naïve (Thomas, 2006). There is sometimes little point making a direct distinction between on and offline. Mobile apps facilitate digitally mediated local markets and so alert us to the fact that the online and offline are indistinct. In those cases dealer and buyer still mostly need to meet in person to exchange. Cryptomarkets mediate rather than replace offline supply chains (Aldridge and Décary-Hétu, 2016). Existing open air markets are facilitated by the exchange of information via mobile devices, messaging services which use the internet. There is little distinction to users between using a messaging app and texting, though each may use a different infrastructure. Mostly people are rarely offline, and even when they are not directly connected are still held within a lattice of digitally enabled, connected devices and platforms. The digital can be the site of effective, knowledge producing, information sharing, harm reducing communities (Davey et al., 2012). For most users however the importance of digital life is how it reconfigures the relationships between those involved in drug communities and markets and the means through which they interact, share, and evaluate (Tzanetakis et al., 2016).

In addition to the digital not being a distinct sphere, it is also not everywhere in the same way. In the developing word, the ubiquitous mobile internet does not fully substitute for the absence or patchy availability of a fixed service. The physical availability of good fibre optic cable and short range wifi makes for a more reliable, effective and cheaper internet. In many parts of the world people have to rely on limited and costly cellular broadband. Infrastructure is important in how people interact with digital services and spaces. Increasingly people have no choice but to interact with these services and conduct their work and finances through them, so the digital reproduces unbalanced power relations. In part that explains why the cryptomarkets are relatively localised to Western countries. Drug producers in South America, Afghanistan and other places cannot replicate the supply chain through the internet and have little incentive to when there are well established trafficking systems.

The digital also produces new ambiguities, such as between legal and illegal, and between healthy and unhealthy. Users of study drugs in Western countries rely on semi-legal websites to buy modafinil, ritalin, adderall and other psycho-stimulant pharmaceuticals, following at the pattern established by the earlier availability legal highs (Bruneel et al., 2014). The site owners rely on deliberate ambiguity about the legality of making regulated drugs available in this way. Contributors to internet forums challenge the idea that drug use is automatically incompatible

with good health. In both instances users are moving beyond the binary oppositions that have in the past informed research and governance. Digital life facilities that both practically and conceptually.

Conclusion

Drug users and dealers took to the digital rather faster than researchers did. In past decades, deals were conducted by Internet Relay Chat, pager, then mobile phones, and now through mobile apps and darknet cryptomarkets. In the process there is a growing ecosystem of drug dealing and information production happening on or through digital devices and platforms. The role of researchers is more than being bystanders that tap into that data-stream as and when they like. Researchers who work with the digital are also working with and responding to emerging and maturing digital communities. Increasingly, research priorities are set in conjunction with them. These communities inhabit various digital spaces, whether a relatively fleeting and pared down Grindr or Tinder account, or a richer and more developed cryptomarket forum. They have varying degrees of entanglement with the material world. Increasingly our methods will reflect and recreate that entanglement as the space in which drug users and dealers inhabit.

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