[GS-03-014] GIS and Critical Ethics

Abstract

This entry discusses and defines ethical critiques and GIS. It complements other GIS&T Body of Knowledge entries on Professional and Practical Ethics and Codes of Ethics for GIS Professionals. Critical ethics is presented as the attempt to provide a better understanding of data politics. Knowledge is never abstract or non-material. Spatial data, as a form of knowledge, may mask, conceal, disallow or disavow, even as it speaks, permits and claims. A critical ethics of GIS investigates this situated power-knowledge. Two concepts from educational pedagogy are suggested: threshold and troublesome knowledge. As we use and continue to learn GIS, these concepts may enrich our experience by usefully leading us astray. This points finally to how ethical critique is practical, empirical and political, rather than abstract or theoretical.

Keywords: critical ethics, critical GIS, disruption, epistemology, knowledge, practice, threshold concept, troublesome knowledge

Author & citation

Crampton, J. (2018). GIS and Critical Ethics. The Geographic Information Science & Technology Body of Knowledge (2nd Quarter 2018 Edition), John P. Wilson (ed.). DOI:10.22224/gistbok/2018.2.8

This Topic is also available in the following editions:

DiBiase, D., DeMers, M., Johnson, A., Kemp, K., Luck, A. T., Plewe, B., and Wentz, E. (2006). Ethical Critiques. The Geographic Information Science & Technology Body of Knowledge. Washington, DC: Association of American Geographers.

Explanation

1. Definitions

Kranzberg's First Law of Technology: "It is neither good nor bad; nor is it neutral." Although not a law as such, Kranzberg's formulation can be understood as denying the possibility of a pure technology. Confronting this impossibility, the GIScientist cannot avoid having to face ethical questions.

Data politics: The question of the way that GIS, spatial analysis, and mapping speak to Kranzberg's First Law.

Normative ethics: To act according to norms, codes or rules.

- Deontology, associated with Kant's categorical imperative (treat others in a way you would wish to be a universal law).
- Consequentialist ethics is to act according to what produces good outcomes, weighing costs and benefits (e.g., utilitarianism).
- Virtue ethics emphasizes virtuousness and moral character.

Applied ethics: the ethics of a particular domain, such as biomedical ethics, institutional review board (IRB) regulations, professional ethics, or environmental ethics.

Ethical critique: The attempt to provide a better understanding of data politics. More specifically, it is an attempt to defamiliarize the taken-for-granted by questioning the taken-for-granted. It is not therefore theory or knowledge, but practice.

Critical ethics: The practice of "striking at oneself" in order to change one's position, with a view to making new possibilities. See also pharmakon.

Pharmakon: A key Greek term in Plato's dialog The Phaedrus (written c. 370BCE). The word can be translated in three ways: as a remedy, a poison, and as a scapegoat. This multivalency has been of interest to many writers including Jacques Derrida and philosopher of technology Bernard Stiegler. They use the self-contradiction between poison and cure as a metaphor for critique "striking at oneself."

Knowledge: Traditionally defined as "justified true belief," philosophers have subsequently complexified each of those three terms.

Power-knowledge: The concept that knowledge and power do not exist in isolation from one another. The term was invented by Michel Foucault.

Limits to knowledge: Although knowledge may have logical or technological limits, knowledge may also have limited efficacy, as when it is rejected even if true (eg., climate change), or as when it is lost or inaccessible to the knower (eg., it is repressed because it is traumatic). The question of what then comes "after" or beyond knowledge opens up the possibility of practice.

Troublesome knowledge and threshold concepts: When put into practice as part of doing GIS, these provide mechanisms for ethical critique. Two examples discussed are "the power of the map," and "going beyond the geotag."

2. GIS and Critical Ethics

Many GIS users are professionals who strive to produce the product or service their team has been tasked with. Many more are students learning to enter the field by demonstrating core competencies. How can we succeed? One option might be to learn from examples or use cases. But the array of possible use cases in GIS is vast and only getting vaster. Stan Openshaw once famously said that GIS allowed us to:

analyze river networks on Mars on Monday, study cancer in Bristol on Tuesday, map the

underclass of London on Wednesday, analyze groundwater flow in the Amazon basin on Thursday, and end the week by modeling retail shoppers in Los Angeles on Friday (Openshaw 1991, 642).

This diversity implies we cannot learn GIS by only studying “vertical” use cases because there are so many, but rather by mastering “horizontal” principles such as projections, mapping design, and spatial interactions, that can apply across use cases. The purpose of the Body of Knowledge (BoK) is to provide this knowledge in a fashion that can be successfully adopted by GIS users and educators.

The BoK shares this thematic approach with many other subjects. A problem with a knowledge-only approach such as that promulgated by the BoK is that knowledge does not exist in the abstract. Knowledge has limits; logical, practical and preferential. For example, in the 1990s the American Congress on Surveying and Mapping (ACSM) published a series of booklets aimed at the general reader guiding their map projection choices (Robinson and Snyder 1991; Robinson 1990). The reader would have no idea however, that these were conceived to “push back” the perceived malign influence of the Arno Peters map projection, which had been openly developed as a political and anti-racist map. As an attempt to assert a pure knowledge, the ACSM booklets could only do so by suppressing their own politics.

Or consider Wikipedia, perhaps the most successful open knowledge-sharing initiative in history. In theory anyone can write an entry on any country in the world (they do no need to be resident there). Research has shown however, that participation is highly geographically uneven, with disproportionate participation in the world’s economic core. Even those who do participate from economically peripheral areas tend to contribute to the world’s core rather than local areas (Graham, Straumann, and Hogan 2015). In other words, Wikipedia recapitulates rather than transgresses pre-existing knowledge structures.

The French philosopher and historian Michel Foucault coined the term “power-knowledge” to better reflect how knowledge is grounded in power relations: “power produces knowledge…there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations” (Foucault 1977, 27). It is therefore the job of critical ethics to better understand these data politics. A critical ethics is not a normative ethics, but one which seeks to “strike at oneself” in order to question the taken-for-granted. In order to see how this might work for GIS, in the next section we widen the perspective a little, before refocusing on data politics specific to GIS.

3. Many-sided Nature of Data Politics

According to Melvin Kranzberg, technology’s First Law is: “technology is neither good nor bad; nor is it neutral” (Kranzberg 1986, 545 emphasis added). Kranzberg’s Law, although not a law as such, tells us that we should not think of technology such as GIS in the abstract, but embedded within a whole array of conditions, actors, institutions, and aspirations—a data politics. Any use of technology therefore implies taking an ethical position. Recent work on the histories of Big Data have shown that data too are always situated (Aronova, Oertzen, and Sepkoski 2017). For example, the well-known choropleth map was not invented by a cartographer, but by a nineteenth-century French politician worried about the lack of education (for boys) in certain areas of rural France. Now it is the

most common form of thematic mapping in GIS (Crampton 2004).

The multi-sided nature of knowledge was a point made by Plato, who tells the story in his well-known dialogue the Phaedrus of how in ancient Egypt the god of knowledge (Theuth or Thoth) discovered numbers, calculation and "to cap it all, letters [writing]" (Phaed. 274d). Writing down knowledge seems to only offer advantages as far as Thoth can see, and he takes his discoveries to Thamus or Ammon, king of the gods. Thoth tells Thamus that "what I have discovered is an elixir [pharmakon] of memory and wisdom" (Phaed. 274e). The king tells him however that:

your invention will produce forgetfulness in the souls of those who learned it through lack of practice at using their memory, as through reliance on writing they are reminded from outside by alien marks, not from within… [s]o you have discovered an elixir not of memory but of reminding. Your students…have acquired the appearance of wisdom instead of wisdom itself (Phaed. 275a, emphases added).

Plato's point is that knowing things is not enough. We also need to think, and, by extension to "practice" by asking questions. Knowledge has many sides, some of them self-contradictory. Plato himself condemned writing, but he has been a huge and influential writer, and we know what he thought because he wrote it down. Yet as soon as we think we know something, we stop thinking. This is known in psychology as the "Dunning-Kruger effect," whereby people who think they know the answer (but do not) are overly confident about what they know (Kruger and Dunning 1999). Knowledge is sometimes limited not by what we can know, but what we prefer (not) to know.

The practice of asking questions is what is meant by critique in its broadest sense. Ethical critique—for example, how is knowledge represented as data—asks about the limits to knowledge and of reasoning (including reasoning informed by ethical codes, see GS-11). Unfortunately, critique all too often comes at the end of a project. We might ask: Did the project attain its goals? By placing critique "outside" or at the conclusion of a project it is implied that critique is separable from doing the project itself (Elwood and Wilson 2017).

Yet neither can GIS simply get rid of critique. Any science must be criticizable (which leads to improvements and advances) or it remains at the level of superstition, and becomes out of date. And GIS (GIScience) does position itself as a science. Critique is useful to GIS in other ways; not all of which are beneficent. By including ethical critique, GIS advocates can claim that they have done due diligence and have "taken account" of it. So critique must as it were from time to time be absorbed, if only to demonstrate the maturity of GIS. In both this edition of the BoK and the first edition, the editors made sure to include a section on what they call "GIS and Society," using a term devised in the 1990s developed to acknowledge the social role of mapping and GIS, and that it was not just a technology. On the other hand, there has been a partial relapse with the deployment in this edition of the term "GIS&T" which could represent a turning away from what we've learned of technology as socio-technology: as if technology exists "outside" of culture. Ethical critique then can be usefully turned on ourselves.

4. Going astray: the ethics of GIS

In this section, I want to put ethics into practice, or rather to see how it is already at work.

For ethics, as a form of “doing critique,” is not something that can only be learned by reading or knowing as discussed above, but must be experienced (see hooks 1994, especially chap. 6). A useful way to understand “doing” ethics is going astray—ethics is when we go off-course, or deal with something foreign. This of course is not easy because the truth is painful and traumatic, but from time to time we must draw the pharmakon into ourselves from where it is sequestered.

There are two long-standing concepts in the educational literature that may be useful here: “troublesome knowledge,” and “threshold concepts” (Perkins 1999; Meyer and Land 2003; Bampton 2012).

What do these mean? As Donna Haraway recently pointed out (2016), the word trouble has an etymology leading back to ideas of stirring things up, making cloudy (a related word is turbid), agitating. Troublesome knowledge is the idea that as we learn we encounter knowledge that is “difficult” for us in some way; it stirs us up. We can all think of some knowledge that troubles us—something that we’d much rather ignore or pretend isn’t true. Attempting to limit knowledge is normal and the study of it even has a name—agnotology (Proctor and Schiebinger 2008). Yet this encounter between what we know we know, and what we don’t want to know because it disturbs us is the ethical moment. There may be many reasons we find something troubling, but I want to focus on one offered by Perkins (1999): when knowledge is what he calls “alien.” That is, it comes (or appears to come) from somewhere different from us, and it disrupts us. What we can underline here is that we object to (ie., disavow) this knowledge not only because we have calmly considered it and found it lacking, but because we retain emotional commitments to our present viewpoint. These affective barriers and disavowals, and our encounter with this alien knowledge are where we see ethics at work (that is, the pharmakon; recall that Plato calls writing “these alien marks”). In Bampton’s terms, these are misconceptions, asserting that “all available evidence points to misconceptions as a significant, enduring, and as yet unstudied problem facing GIScience students and teachers” (Bampton 2012, 128).

From a psychological perspective, the most difficult knowledge to confront is our own—knowledge about ourselves (eg., our desires and anxieties) that we would rather not encounter. However, it is likely that these desires are socially seeded in us. If I desire a new pair of jeans, it’s not because I created the desire in my own mind, but because an ad I saw convinced me I look handsome in them. The trouble here is not that we cannot acknowledge that advertising influences us, as that we don’t want to see ourselves as shallow fashion victims. Bringing the socially seeded origin of these beliefs to light can start us on a new track.

What is troublesome knowledge in GIS? An example are “data” and data categories. For many people data “just do” represent the world, and we find it difficult and troubling to consider where data categories such as census racial categories come from, or why, if we can collect data such as crimes across an urban area, we should not then use it to predict future crimes as is done in predictive policing (PredPol) because crime databases are deeply racialized (Kaufman 2016). Interestingly, we can conceptualize troublesome knowledge as a core (an easier knowledge to accommodate) and periphery (a truly troublesome knowledge). At the core of the concept of data, the student may be very easily persuaded that data have a genealogy or history. For instance, census racial categories vary historically, and furthermore did not even begin to count certain categories until the late twentieth century (eg Hispanic and Latino/a) (Nobles 2000). Logically, we can

understand that how things are counted will impact results (data). But more penumbral understandings of race (e.g., that it has no biological reality), often prove troublesome for us to understand. For example, we fail to disambiguate the fact that people are biologically different from “race.” There is also the troubled question of whether racial data should, or should not, be collected in the first place. That is, although our spreadsheets may be full of numbers, they are empty of meaning.

A useful GIS classroom exercise to understand the socially constructed character of spatial databases is to practice generating, rather than downloading them. For example, we want to measure Wifi speeds across a neighborhood. To do this we will send out a team of 20 people to record speeds using a convenient device—our smartphones. Right from the beginning, a whole host of decisions have to be made, none of which appear overtly in the final spreadsheet. Were all the data collected at the same time of day? Did the team have identical smartphones or were some newer? Did all members of the team turn off cellular data connectivity and truly measure Wifi only? How are the data later categorized? Unpacking the database in this way is known as “database ethnography” (Schuurman 2008).

Databases are usually constructed in order to make decisions, but those decisions themselves may be affected by data politics. Angwin and colleagues have recently shown that algorithmic calculations of recidivism risk is not so much a risk of the individual, but of that person’s racialized socio-economic backgrounds (Angwin et al. 2016). Disproportionate “contact” with police through the lifespan will be used as input for the recidivism score. For example, African-American youths riding on bikes may be disproportionately pulled over by the police. A similarly aged white American will not likely have these “contacts” on their record. The recidivism score then may be saying more about the social background of people than of the individuals (also known as the ecological fallacy).

The threshold concept is related to troublesome knowledge (Meyer and Land, 2003). The idea of the threshold concept is that it will transform the thinker, or take them to new places (hence, to lead them astray). It too, may be uncomfortable and involve a certain degree of unlearning. As hooks (1994) describes so well, the point is not that the student transform into one particular (subject) position or another, but first to realize the very possibility of transformation, to transgress received norms (itself a thrilling and fearful experience) and also to “live” the change in ways that are meaningful to you (ie, a praxis). She calls this a “practice of freedom.”

Meyer and Land argue that a threshold concept is distinct from a core concept in a body of knowledge. A core concept is a conceptual building block. In GIS, this might include scale, projections, effective design, or data attributes. The GISci Body of Knowledge is an example of (useful) core concepts. The threshold concept, by contrast, is transformative, irreversible, integrative, and bounded (and is often troublesome). Some of these aspects can apply at the level of research, as well as at the level of the individual. Transformative research for example is that which changes the way we think about something as a discipline, and is especially prized by granting agencies such as the National Science Foundation (NSF). The BoK may well succeed at achieving its goals, but the ethical task of transformation in ways of thinking and acting (troublesome knowledge and the threshold concept) must take place among GISci users and educators—critical ethics is not learned, but practiced.

An example of a threshold concept in GIS is the power of the map. It was only in the 1980s

(rather late, compared to other disciplines) that writers started to question the notion of representation in mapping; that it was non-referential, that it was creative and not passive, and that it exercised power as much by its absences as by its presences (Harley 1988). The threshold concept of the power of the map transforms our thinking of mapping from passively reflecting meanings to actively creating meaning.

Another threshold concept in GIS is the transformation from thinking of spatial objects and events as locationally-specific entities with attributes, to an embedded network of relations. An X,Y location with Z1, Z2…Zn attributes is computationally easy to represent, but the real world is not organized so discretely. We may need to “go beyond the geotag” to properly understand spatial events and processes (Crampton et al. 2013).

Both these examples of threshold concepts are illustrated in the following case. After a series of riots across Britain in 2011, media outlets attempted to understand the riots by superimposing riot locations with an “underlying” measure of socio-economic deprivation, a measure of poverty. The published map permits visual inspection to determine if there is a correlation between rioting and social deprivation, or we could use spatial analysis to see if there is significant clustering. But by framing the narrative in this way the map does not just offer a picture of what happened, but also suggests certain causal factors (poverty → riots) and it even implies certain kinds of corrective prescriptions. Depending on the leaders of the day these might include sending more police to deprived areas or to develop social policies to alleviate poverty. Finally, the map also suggests that poverty is “in” those areas, rather than an alternative view, which would see poverty as being produced somewhere else such as the workplace because of poor wages, and experienced by the people who live there (Yapa 1996). Seeing poverty as an “attribute” of an area is environmental determinism by another name.

Thus the power of the map is a threshold concept for many beginning students. That the map is incomplete is evident to most; that the map is unable to put something into representation because the real world is not completely symbolizable is a harder concept. Examples of the latter include affect or feelings such as fear, anticipation and anxiety, as well as psychological commitments. Many if not all of these are likely to be present in rioting but are not (directly) mappable.

5. Conclusion

This contribution has:

- Situated critical ethics of GIS as sequestered—separated but not divorced—from GIS as a valid “coping strategy.” However, the encounter with it can occur at any moment.
- Defined critique as a poison, a curative and a scapegoat (Plato’s pharmakon)
- Suggested that critical ethics is not just knowledge, but a form of going astray, or breaking habits of thought.
- Employed concepts of “troublesome knowledge” and “threshold concepts” from the pedagogical literature to illustrate how knowledge and practice have transformative effects.

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