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Designing unpredictable futures.

An anthropological perspective on the algorithmical prediction of human behaviour

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Abstract | In this paper, we propose a cultural interpretation of the role of designers who work with data in Global North society, drawing on a comparative anthropological method. We trace connections between them and those who master technology in other societies, i.e. blacksmiths in West Africa, in order to interrogate the cultural meaning of the practice of pattern recognition. There are many concerns (mainly ethical and epistemic) and an increasingly lively debate around the growing role played by data-driven objects, infrastructures and systems in our daily life. The comparison that we propose draws on but also adds to this debate, emphasizing the socio-cultural risks and opening to reflections that may avoid these. It calls into question the emerging feature of aliveness of technology and the scientific and socio-cultural consequences that come with it.

KEYWORDS | BIG DATA, ALGORITHMS, FUTURE, WILDERNESS, ANTHROPOLOGY

1. Introduction

This paper proposes a cultural interpretation of the role of designers who work with big data and algorithms for the prediction of users' behaviours, ideas and tastes. To this aim, we will adopt a comparative lens, which will trace connections between global North designers and West African blacksmiths.

While Mande blacksmiths and global North data designers are quite fairly two different groups in many aspects, both are masters of technology. By naming smithery as a technology, we join efforts within history and the social sciences to multiply technological imagination about what *techne* can be when the material meets the social (see Olson, 2018, p. 229, note 4). Our aim in this paper is to offer insights to data designers to think otherwise their role in dealing with technology.

We found the comparison between these two very different groups particularly propitious for two main reasons. First, both groups aim to master apparently invisible and wild forces through their technology. Second, in both cases what they are dealing with (data or spirits) seems alive, wild and invisible.

There are many concerns (mainly ethical and epistemic) and an increasingly lively debate around the growing role taken on by data-driven objects, infrastructures and systems in our daily life. The comparison that we propose will draw on but also add to this debate, emphasizing also the socio-cultural risks and opening to reflections that may avoid these.

2. Methodology

The comparative approach is at the core of the cultural anthropology research method. Clyde Kluckhohn has famously defined cultural anthropology as the "longest way round", which happens to be the shortest way back home (Kluckhohn, 1949, p. 20). Through this apparent paradox he intended that one should explore different ways of approaching and framing the world, in order to grasp the limits and potentialities of his/her own ways of thinking and doing. More recently, Tim Ingold has defined the anthropological attitude as a "constant awareness of alternative ways of being, and of the ever-present possibility of 'flipping' from one to the other" (2011, p. 239). This constitutes a "'sideway glance'. Wherever we are, and whatever we may be doing, we are always aware that things might be done differently" (2011, p. 239). From this perspective, cultural difference represents a fruitful repertoire of alternatives, which expands the imagination and helps to encompass the constraints of one's own cultural world. In a similar vein, throughout his career, Francesco Remotti (2014) has made a strong argument for the adoption of a transversal gaze in anthropological research. In his view, intercultural comparison has the fundamental function of offering a critical standpoint from which it is possible to scrutinize one's own society. Only when researchers distance themselves from their *hic et nunc* and craft - as Remotti (2014) would put it - "untimely spaces [spazi di inattualità]", new theoretical perspectives to grasp and change the status quo can emerge. According to this methodological framework, legitimate cultural comparisons do not happen merely between geographically close and historically connected societies; they also occur between societies

that are distant in time and space, if they allow for "illuminating connections" (Geertz, 1973, p. 56-57). It is in this vein that in this paper we take the "longest way round", which goes across the Mande blacksmiths, to look at (and challenge) contemporary global North data designers' culture (Pype, 2018, p. 5-6).

3. West African masters of technology: the Mande blacksmiths

Mande people are a linguistic group, made of several ethnic clusters (e.g. Banama, Malinke, Wasaluka, and Dyula people), who inhabit a region that includes part of Mali, Burkina Faso, Senegal, Gambia, Guinea, Sierra Leona, Liberia, Ivory Coast, and Ghana. Being a language, Mande offers a strong sense of belonging to the people who speak it, and the linguistic identification can exceed the ethnic one. Mande society is traditionally characterized by three fundamental divisions: the farmers, who were the nobles (*horonw*), the slaves, who were war prisoners (*jonw*), and the specialized professionals, called *nyamakalaw*, as *nyama* means "the energy for action" (McNaughton, 1993, p. 5).

Blacksmith men belonged to this latter social group, together with bards, praise-singers, entertainers, woodworkers, leatherworkers, and Muslim holy men. Even today, blacksmiths are associated by West Africans to these other specialists, revealing the fact that these masters of technology play a multifaceted social role. Their main job is to fabricate tools and artefacts. However, they work as healers, rainmakers, diviners and fortune tellers too. Thanks to their role as makers of amulets and other secret devices to protect oneself from disease, improve finances, and help in other social matters such as romance, they are acknowledged as able to mediate conflicts, arrange marriage and even to perform ritual roles in the circumcision of boys, transforming youth's bodies from natural into cultural. Mande blacksmiths are recognized so powerful because it is thought they have a privileged relationship with the spiritual world, which imbues them with secret knowledge and skills. To master technology, in the Mande world, is to channel the wild powers of nature into cultural frames with the goal of improving the community both materially and spiritually. When Mande blacksmiths shape iron into tools, wood into masks and immature boys into Mande adults, they articulate spiritual, physical and social forces together, bringing movement and change into Mande society (McNaughton, 1993, p. 156).

Blacksmiths' role as "articulators" between the visible and invisible world draws on the belief – widespread in African societies – that invisible spirits are wild but not necessarily dangerous (Geschiere, 1995). In their wilderness, spirits are neutral. The role of the blacksmiths is therefore key because they can master invisible and wild forces either for the good (i.e. to reinvigorate society) or for the bad (i.e. to break social bonds). By straddling the visible and the invisible world, blacksmiths should be able to domesticate the "wilderness" of the invisible to put it to work for human benefits. Their creations (being them tools, amulets, treatment, etc.) are not untamed wild nature but socialized assemblages of materiality and sociality, which, ideally, should follow and facilitate human needs (Pype, 2018, p. 8).

The imbrication of nature and culture embedded in blacksmiths' technological artefacts makes these ambivalent products because they retain a symbolic link with the wilderness of spirits that even if not necessarily dangerous, has always something that escapes human grasp. The technology produced by blacksmiths is always open to the possibility to turn being evil or unexpected, even if momentarily its potential danger and polymorphism has been tamed. Mande people are aware that the technology produced by blacksmiths has always a link with a world which is beyond everyday life, potentially charged with an unsettling energy which is partly out of control (McNaughton, 1993, p. 149, 162). Technology, in the Mande world, far from being something stabilized or something one can fully rely on, it is rather considered liminal, constantly overlapping the world of humans and non-humans, familiar and strange, beneficial and dangerous. Even if the "wild" energy of technology is tamed and channelled for human needs by blacksmiths, it always and necessarily maintains the potential for an autonomous agency, which escapes humans' understanding and will. Mande people are thus remindful that blacksmiths technology has an original otherness that does not fully match their world, neither their wishes and needs. In light of that, blacksmiths - as producers of technology - are perceived as liminal and ambivalent too. As mediators between wilderness and culture, they tend to occupy a liminal position, being invested with salvific and dangerous power at the same time. They are simultaneously admired and feared, respected and contemned (McNaughton, 1993, p. 41, 160). Moreover, in the past (Ezra, 1989, p. 13), their power was also at the service of the rulers, sometimes with unjust and dominative ends. They fabricated the tools and weapons that rulers employed to control the people through taxes, military break-ins, and other kind of intrusions in everyday activities. This legacy is still alive in the Mande popular perception of the figure of blacksmiths, enhancing their ambiguity. People, indeed, are aware that blacksmiths could use their secret knowledge to weaken human society, instead of reinvigorating it. As they used to equip powerful rulers with their means of control, thus contributing to people's disempowerment, in some respect they also are the target of resentment (Ezra, 1989, p. 13).
In the next section, we will analyse how Mande blacksmiths' activity, role and recognition can be compared to global North data designers and inform what they do.

4. Data designers as masters of technology: comparative insights

4.1 Similarities – Data as spirits

Like West African blacksmiths, global North data designers are considered powerful for their capacity to create order out of the chaos of data. Data, for data designers, are what spirits are for Mande blacksmiths. In the digital era, data have become a new wild nature. The cultural imagination of data conceives them as raw material, which needs to be "harvested", "mined", "captured", "hunted", "mapped", "extracted" and "analysed" by data scientists. This terminology, which is typical of both the scientists' jargon and the ordinary talk, clearly

shows that in global North's culture the world of big data is symbolically understood as a wild, pre-cultural realm that data scientists are able to tame and "cultivate", making it intelligible (and thus sellable) for human needs (Zaloom, 2003; Weinberger, 2011). Google computer scientists played a pioneer role in this regard, since they firstly envisioned the possibility to make sense of the sheer amount of data produced by users, seeing them as "golden dust" (Zuboff, 2019, p. 68) and the "next natural resource" (Deutscher, 2013), rather than as useless "waste material". Founded in 1998 by Stanford graduate students, Google was able to impose computer mediation to an increasing amount of human actions, thus producing new data on the users. Even though initially data were considered simply by-products and ignored as "waste", engineers quickly understood that data could be aptly analysed as sensors of people's behaviour. To this aim, they embarked in designing machine intelligence operations that transform raw material into algorithmic products, which could predict the behaviour of the users (Zuboff, 2019). This extra information has been used to improve services and users' experience, offering them customized technologies that ideally are able to mirror what they think, feel, and like. For example, Facebook has recently launched Facebook dating, which is a service that makes suggestions to the users about people they might like, on the basis of their preferences, interests and other things they do online. The so called "like button", firstly invented in 2005 by VIMEO, is at the core of this development, being part of an increasing number of networking services. In addition to Facebook, it has been integrated into Youtube, Twitter, Instagram, Tik Tok, Linkedin, and other social media alike. As a critical aspect of our present-day human interaction with computers, it provides data designers with a bulk of data on people's opinions, tastes, and feelings regarding a wide range of aspects of their life, such as politics, employment, health, and education. In return of this information, data designers constantly adjust and refine their creations to better match users' profiles. This work of entering into contact, mastering and disciplining the wilderness of data appears then similar to the one performed by Mande blacksmiths who have to master the wilderness of spirits. The technology produced by both data designers and blacksmiths through their work of domestication is put at the service of human needs.

4.2 Similarities – The aliveness of technology

As in the case of blacksmiths, the technology produced by data designers retains a connection with wilderness because it seems "alive". Even if technology anyway needs humans to keep "living" and doing so properly (Pols, 2012), current technology and their spectacular performances (as smart services or algorithmic recommender systems) may give the impression to have their own intelligence and autonomy, thus being "alive" (MacKenzie & Munster, 2019). The "Internet of Things", for example, has opened a new discourse in interaction design, putting into dialogue objects with people, both sentient entities. Designers have started to design quasi 'living entities' that can perceive us and "perceiving us perceiving" (Overbeeke, 2011). O'Sullivan and Igoe put into question how computers perceive humans, and proposed a change by shifting our focus from our own perception to the computer's perception (O'Sullivan & Igoe, 2004). "Beyond human-centered design"

(Antonelli & Tannir, 2019), “post-human-centered design” (Forlano, 2017), “Xenodesign” (Schmeer, 2019) and “designed animism” (Laurel, 2008) are among the terms that are emerging. While this has opened a series of new ethical concerns, here we simply wish to point to how technology is increasingly perceived as having a life of its own. We expect that new technologies not only perform tasks, but also perceive and comfort us, that they recognize who we are and what we need, becoming customized. In this vein, technologies are not to be understood as mere tools anymore; they are rather “partners” with whom to exchange and have pleasant experiences. The fine line between alive and non-alive, the physical and the social, humans and other intelligent entities is undermined (Suchman, 2007).

4.3 Differences – How to manage the relation between spirits/data and humans

While so far we have highlighted elements of similarity (despite the many obvious contextual differences) between Mande blacksmiths and data designers, we now turn to analyse one crucial difference that distinguish them and has important scientific, social and cultural consequences. The technology produced by West African blacksmiths always retains a link with the wilderness of spirits: both users and blacksmiths are aware that technology is a transient product, deriving from a world which is beyond everyday life and potentially escaping its grasp. Mande people do not expect their technologies to neatly and fully match themselves. They always handle technology with care, as it comes from an alien world, never being able to have the guarantee that it has been fully socialized for good. What escapes human’s grasp permeates technology because, for Mande people, culture and chaos are not two impermeable worlds; they are rather interconnected by a fluid and porous boundary. Mande blacksmiths, accordingly, are always aware of their liminal nature and the opportunities but also responsibilities attached to their role (McNaughton, 1993).
On the contrary, in the global North, technology is perceived as what has emancipated human beings from the laces that would make them pray wild and invisible forces, being these spirits or God. Even if debates about technology being either a blessing or a curse are a constant through history, with Enlightenment people perceived that the light of reason arrived to illuminate and get rid of the shadows inhabiting Middle Age darkness. Nowadays, we rely on technology for an increasing number of activities and processes of the daily routine. The goal of designing technologies that match quite fully their users by thinking, behaving, and even feeling as humans is not just a technological utopia but a present reality. In last years, the wondrous advances made by the technological infrastructure, which is able to make sense of big data, have increased both hopes and fears of technology being able to redesign a better future. As a consequence, technology-related professions are gaining both increasing recognition and scrutiny.

5. Beyond common concerns: letting data be otherwise

5.1 Critical big data/algorithm studies

A transdisciplinary debate, called 'critical algorithm studies' or 'critical big data studies'[1], is pursuing the aim to analyse the merits and the faults around the epistemology and related politics of these technologies of prediction and construction of tastes, attitudes, opinions, ideas, ideologies and behaviours. To summarize this debate, Neff and colleagues (2017) have identified the main critiques mobilized against data scientists, which are 1) to consider data as objective rather than the product of interpretative practices, 2) to abstract data from their context rather than to recognize their embeddedness in the context, 3) to reify data without considering the socio-technical apparatus that produces them, 4) to not acknowledge the fact that data are a means to negotiate, produce and reproduce social and cultural values.

The tone employed in advancing these critiques creates an "algorithmic drama" in which "algorithms are figured as powerful, inhuman, and obscure, leaving critics and their readers to fight on behalf of humans (Seaver, 2018, p. 377). More often than not, these critiques proceed from an ideological position, ignoring how things really work in data science and at the expenses of the possibility to create genuine and productive interdisciplinary collaboration. The second Author has instead embarked on a long-term ethnography of data-scientists in the field of computational biology (Raffaetà, 2020) and this experience made her understand that data scientists are usually well aware of the considerations listed above (at least the first three). She could observe how data scientists are not data fundamentalists but critical thinkers, who care for the context, its interpretation, and for data infrastructure. This has also been illustrated by others studying diverse communities of data scientists (Leonelli, 2016; Lowrie, 2017, 2018; Seaver, 2015).

Yet, what all these studies agree on is that the way in which data scientists make sense of 'context', 'values' or 'culture' is highly formatted by their epistemic practices. In the case analysed by the second Author, for example, the context considered by data scientists rarely exceeds the walls of the molecule and the most rewarded value is parsimony (in informatic terms) and efficiency. This is very different from making sense of data as part of a context that always, already and necessarily exceeds human's grasp and understanding, as Mande do in constantly reminding of the inescapable connection between spirits and technology.

5.2 Ethical concerns

These epistemological concerns are linked to the main debate that revolves around data-driven technology and society, which is ethics. This centres on users' privacy, new forms of mass surveillance and the exacerbation of inequalities. For example, the concept of "surveillance capitalism" underlines the peculiarities of present-day information capitalism

[1] For a list of readings and other resources, see https://socialmediacollective.org/reading-lists/critical-algorithm-studies/?blogsub=confirming#blog_subscription-2

driven by data (Zuboff, 2019). Similarly, the notion of "sensor society" (Mark Andrejevic & Mark Burdon, 2015) contributes to shed light on the "dark side" of the algorithmic prediction of behaviours. Nowadays, the collection of information is less and less purposeful and active, and increasingly pervasive and automatized, the users generating data inadvertently, while they go on with their everyday lives. This is the case, for example, of mobile phone users who generate data on where people make calls, what websites they visit and for how long, etc. This amount of data eclipses the data they actively communicate in the form of text messages, emails, and phone-calls, as the device is doubled as a sensor. As a result, data miners' practices are opaque, aiming at correlating rather than interpreting bits of information, and the users have little chance to become aware of their data extraction, feeling rather powerless and intimidated by the complexity of the automated intelligence (Mark Andrejevic & Mark Burdon, 2015; Zuboff, 2019). This brings to the forefront the emergence of new inequalities and discriminations, that draw a line between those who mine and those who are mined (O'Neil, 2017).

5.3 The socio-cultural risk

But beyond these well-debated epistemic and ethical concerns, with this paper we want to bring attention to the socio-cultural risks advanced by designing data without letting space for data to be otherwise. What do we lose by living in a technological world which assumes that we can grasp everything and that aims to fully match our wishes, ideas and behaviours? Will the sense of familiarity and safety we could gain in such a world be able to reward us for the losses?

To live in a technological world which is designed to match as much as possible users affects the viability of "escape routes" (Favole, 2018). According to Favole, "escape routes" are critical moments, during which the normal flow of events is suspended and unexpected occurrences may happen. These moments of "crisis" foster people to think out of the box and to rely upon improvisation and creativity. Following this perspective, when objects run wild, not performing as we might expect, spaces of possibility open up, where to think and act differently (Jackson, 2014). These are "leaks" in the status quo that should not be "plugged" but let them flow as they carry with them cultural dynamism. They come together with feelings of estrangement and unsettlement, which force people to change their perspective and experiment with diversity.

6. Conclusion

In this paper we have drawn a comparison between data scientists/designers and Mande blacksmiths to draw attention on the emerging feature of aliveness of technology and the scientific and socio-cultural consequences that come with it. Both Mande technology masters and global North data analysts are seen by ordinary people as liminal figures, who straddle culture and nature, society and the wild realm, bearing secret knowledge to tame the untamed (being this knowledge either ritual formulas or secret algorithms). Their special skills consist in the ability to articulate and connect different realms, assembling together

raw materials and culture. In doing so, they concentrate in their hand exceptional power, which is regarded as both dangerous and salvific by the rest of the population, who is somehow aware of the fact that they forge technology and society at the same time.
While Mande blacksmiths and data designers have many things in common, one aspect distinguishes them dramatically. This is the *attitude* put into being in translating a wild and chaotic world (of spirts or data) into a cultural one, adapted to human needs and wishes. Usually, epistemic and ethical concerns are those mostly at the forefront, but the "longest way round" offered by Mande blacksmiths sheds light on the socio-cultural risks of designing data without letting space for data to be otherwise. A world with no "escape routes" is not just an intellectual problem: it has concrete consequences on how we live because 'culture' it is not made of abstract ideas but it materializes in how our lives are shaped by objects, infrastructures, norms, relations, etc.
To ask designers to let "escape routes" to data - and to us - it is not being naive or against technology. We acknowledge the great benefits technology has brought to humanity and its power as an inescapable and creative force in tracing humans' path in this world. That's why we care for technology and how it is made. Clearly, we are not advocating for a technology we cannot rely on or that fails. What we aim to address to designers with this paper is to reflect on which solutions and routes they can devise to continue to make our lives better while keeping open routes for wonder, surprise, regeneration and change.
By promising intimacy and perfect mutual understanding, smart objects and environments risk impoverishing culture of its escape routes towards the untamed. This is, indeed, a source of regenerating chaos, from which to learn to tackle and to come to terms with the unknown. Is the selfie the best metaphor of this dynamic, where people mirror themselves as they look at the world, the technology and the surroundings becoming a projection of the self, without any chance to grasp anything else?

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