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Guest Editorial
Misdirection in Global Health
Creating the Illusion of (Im)possible Alternatives in Global Health Research and Practice

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This issue is dedicated to friend and colleague Dan Allman who passed away of the 27 January 2022. Dan had a paper in the special issue that he did not get a chance to complete; we have included a Tribute to his work that summarises his ideas. May he rest in peace.

Introduction

Founded in 2003, a novel medical technology company called Theranos introduced a small automated device which promised to test for hundreds of diseases and health markers rapidly with only a small sample of blood. This device had the potential to make dramatic and paradigm-shifting changes to public and global health, as it required so little health infrastructure to operate. Theranos, situated in Silicon Valley, was immediately dubbed the "Apple of Biotechnology." The company was founded and led by an intriguing character, Elizabeth Holmes, a blonde, blue-eyed, 19-year-old, who had dropped out of Stanford to pursue this passion project. In TED talks and to the media, she promised to "rescue the world" with this remarkable device.

Holmes' charm and enthusiasm for change was infectious. Theranos quickly raised nearly a billion dollars in investments, attracting a remarkable cast of investors, including Henry Kissinger, George Schultz, and James Mattis. While to many, Holmes' dedication and charisma seemed genuine, behind the scenes, her promises were not being borne out. Potential investors were told that they were seeing demonstrations of the technology at work, but in fact the blood tests were actually being done through conventional methods in another room. When an error occurred, a slow progress bar would pop up, ensuring that malfunctions would never be seen, only delays. None of this deterred Holmes from painting a picture of herself as a prophetic figure on the verge of transforming the world.

This illusion of promise worked incredibly well, deceiving regulators, investors, the public, and even those inside the company, until it didn't. Once prototypes of the device were embedded in a select number of pharmacies, the immense deception behind the company became clear, and Holmes' empire began to collapse. The narrative quickly transformed from one of an inspiring prodigy to one of a pretend genius who had no trouble engaging in elaborate deception in order to attract funders. This story of Elizabeth Holmes, the charismatic villain, proved irresistible, quickly leading to a bestselling book and widely viewed documentary (Carreyou, 2018; Gibney, 2019).

While this story of fraud and malicious intent can easily be told (and indeed has now been told within criminal charges brought against Holmes') another, more complicated story lurks beneath the surface of this one. This alternative tale is one involving layers of misdirection, a concept that this special issue borrows from the realm of magic. Beyond the deliberate deception of Holmes lie many background conditions, forms of tacit knowledge, and perverse incentives that helped make this remarkable global hype and deception possible. As Holmes herself emphasizes in her own defense, the culture at work in Silicon Valley is one in which exaggerated promises of the potential of startups are entirely ordinary. Those building a technology from scratch require funding, and such funding is secured through selling the promise of one's technology to potential investors. Unsurprisingly, in this negotiation, the line between 'we will' and 'we can' is not always drawn very clearly for potential investors. How much is required to declare that one has a proof of concept - a drawing, a patent, a working device? In this realm of cloudy truths, countless Holmes are created every day in the infrastructure of Silicon Valley, as young entrepreneurs acquire the tacit knowledge essential to success in the tech industry - make promises, grow investments, and hope that you can follow through later (Collins, 2010). Such a strategy is so commonplace that it is not immediately recognized as deception or fraud; rather, it manifests at a pre-conscious level, and is gained gradually, for instance through enculturation and professionalization.

As such, the narrative of Elizabeth Holmes, who was "out for blood in Silicon Valley" is itself a form of misdirection, drawing out attention towards a single actor with clear intentionality, and distracting us away from the complex features which combined to foster conditions that rendered it difficult, even impossible, to ask tough questions, even when it was evident that statements being made about the device's capabilities were false (Gibney, 2019). The common narrative encourages us to see the story of Theranos as an outlier, a tragedy that is unlikely to happen again, rather than part of a complex web of intentions, relations, and structures that serve to support and normalize forms of deception.

In this special issue, we explore such complex webs through the concept of misdirection, examining how it operates in the realm of global health. Misdirection is a concept developed within studies of magic (Kuhn, this issue), utilized in psychology and the cognitive sciences to describe a cluster of means and mechanisms by which attention is channeled, and processes of action obscured. Such a concept is especially welcome in global health, a complex, contested, dynamic, influential and loosely bounded domain of research and practice, replete with performance: from the anticipatory framings of funding bodies (McGoey et al., 2011) to accountability mechanisms, narrative control and a host of tacit assumptions that form its discursive arena (Montgomery et al., 2017; Sariola et al., 2017). Within STS, scholars have analyzed the relationship building, laboratory work (Pollock, 2014), geographic imaginaries (Herrick and Reubi, 2017; Brada, 2017) international collaborations (Sariola and Simpson, 2019), training regimes (Engel et al., 2014), drug development and the production of data (Kingori and Gerrets, 2019) that go into making up global health as a field. However, few have sought to directly tackle global health's particular form of solutionism: *how* are some practices and outcomes configured as the only viable option? The analytic of misdirection, taken up in numerous ways by contributors to this special issue, aims to fill this gap, furthering STS vocabularies of (and for) global health. Operating as a concept that points to processes that, we argue, profoundly shape the broader field of global health, the need for the concept of misdirection arose out of shared field observations of power, narrative, and practice.

In this Introduction, we review literatures that complement and structure this analytic, positioning misdirection between schools of thought and describing the approach each of the contributors to the volume have taken in mobilizing its illuminating capacities. In doing so, we emphasize the interpersonal, narrative, structural and performative capacities of misdirection, and outline its potential as an analytic through which to see the interplay of illusion, attention shaping, distraction, deception, and solutionism that works to close down some global health futures, and ensure others.

From magic to attention

The concept of misdirection in this collection operates as a means of interrogation. As the papers demonstrate, it can offer analytical purchase at a number of scales, from analyses of systemic practices to more intimate settings of treatment and health, beginning from a critical position that something is happening that is shaping both the outcome and perceptions of it. To situate misdirection as an analytical tool, we visit first the world of magic, a domain more widely addressed by historians of science (Webster, 1982; Vickers, 1984; Marrone, 2014) than STS scholarship, before going on to review how critical studies of attention – its objects and characteristics – can inform observations of misdirection in practice.

Imagine yourself arriving at a magic show. The darkened theatre and a spotlight on stage. Perhaps the room is not large, perhaps you are there with twenty or so others, close enough to the stage to see scattered sequins from the last performance, and see the dimly lit faces of others. When the performance begins, the magician engages the audience, asking for chosen cards, discovering items in pockets, and anticipating the unexplainable, as you watch closely. You want to see how it is done. Each time, how the coin arrives here, or the card there, eludes you. You and your friends leave impressed, discussing theories of *how* each trick was achieved.

Performative magic is an art-form in which magicians create the illusion of the impossible (Ortiz, 2006). In the growing field of research into the 'how' of performative magic, researchers have made the case that by neglecting the efficacy of magic, cognitive scientists miss a key way of understanding perception (Kuhn et al., 2008). Scholars have since analysed the ways that professional magicians exploit 'cognitive limitations' (Kuhn, 2019), the processes underlying human attention, perception, deception and free will.

Misdirection, in this literature, is a specific process deployed by magicians in order to prevent the audience from detecting the deception that has been used. In other words, misdirection prevents the observer from attributing the true cause of the magical effect they have witnessed. In the magic show you just imagined, the coin trick the magician performed used sleight of hand

to make the coin vanish. Misdirection is used to prevent the audience from noticing the sleight of hand. The magician may exploit, for example, the public's attention, by using their eye gaze to guide the spectator's attention away from the sleight of hand or by asking the spectator a question at a crucial moment, which will automatically draw the spectator's attention towards the magician's face, and thus preventing them from noticing the sleight of hand (Kuhn, et al., 2016). Misdirection, then, is the process of directing people's thought processes, including their *attention*. Magicians will orient their audience towards an intended outcome while simultaneously diverting their attention away from the process used to achieve it (Kuhn 2019).

At present, attention is a topic of renewed interest across fields - from digital humanities (Bucher, 2018; Bucher and Gelmond, 2018; Thain, 2018) and aesthetics (Prendergast, 2004) to neuroscience (Lorenz-Spreen et al., 2019; Macknik and Martinez-Conde, 2010) cognitive science (Kuhn et al., 2016) and literature (Odell, 2020). Thoroughly interdisciplinary, "it seems there is no popular issue that can avoid being framed in attentional terms" (Pedersen et al., 2021: 311). As anthropologists Pedersen, Albris and Seaver point out, the 'attention economy' was first described by psychologist Herbert Simon in 1971: "when information is abundant, human attention becomes a scarce resource', yet it remains elusive 'mean[ing] different things in different contexts, appearing at times synonymous with willpower, perception, valorization or care" (Pedersen et al., 2021:310).

Our interest in this collection, however, is less to do with scarcity and the economic, but shares a desire for the kind of account that 'understands attention as an irreducibly socially and materially mediated phenomenon, not simply as a scarce resource *that is located in and limited by individual mind-brains*' (Pedersen et al., 2021: 312, emphasis added). Within the anthropology of media, internet and digital platforms, this means taking a more distributed approach to attention, considering its infrastructural components, financial incentives, fashions, wherein attention "partakes in and reproduces larger political structures and economic flows" (Pedersen et al., 2021: 319). From this, we borrow license to consider what the

shaping of attention does within the structures of global health. Our attention is socially delineated. What we pay attention to and what we don't, what we foreground and what recedes into the background, what we notice and ignore, is formed by our participation in collectives, or 'attentional communities' (Zerubavel 2015:9, 53). This creates a perceptual readiness to notice or ignore that can be linked to particular subcultures such as disciplines (Zerubavel, 2015: 56) and scientific practice more generally (Zerubavel, 2015: 111). Freudenburg and Alario (2007) in *Weapons of Mass Distraction: Magicianship, Misdirection, and the Dark Side of Legitimation* focus on those elements that are *required to disappear*, on the attention that needs to be evaded to maintain legitimacy. For example, misdirection is operationalized by diverting attention away from any questions about existing distributions of privilege in politics. Mc Goey (2012) emphasizes how a focus on "strategic unknowns resists the tendency to value knowledge over ignorance or to assume that the procurement of more knowledge is linked in an automatic or a linear fashion to the attainment of more social or political power" (Mc Goey 2012: 1). These strategic unknowns or elements that are evaded or what is absent or strategically hidden become key for the misdirection process to work. Gross (2010) defines several types of 'unknowns': 'nonknowledge' (that what is not known), 'nescience' (we don't know that we do not know certain aspects) and, 'negative knowledge' ('the active consideration that to think further in a certain direction will be unimportant' or 'even dangerous') (Gross, 2010: 68). Taussig emphasizes the relevance of public secrets, i.e. what is "generally known but cannot be articulated" (Taussig, 1999: 5) and their relation to power (Taussig, 1999). Questions around what type of knowledge and processes are strategically ignored and its link to power is at the heart of this volume.

Misdirection as an analytic therefore emphasises both what we notice, and what remains hidden or inattended and it can help 'unmask' the process of distraction and perceive what is absent. For example, White describes how framing ethical research as an informed consent procedure focuses attention on the details of the procedure while obscuring questions such as "whether

the whole political and epistemological process can be judged ethical" in the first place (White, 2017). Similarly, work on method in global health has critiqued the way evidence-based medicine privileges and perpetuates particular methods and ignores evidence obtained by other means (Oreskes, 2019; Kingori and Douglas-Jones, 2020; Peeters Grietens et al., 2019). This 'purposefully underdetermined' (Pedersen et al., 2021: 312) perspective on attention and misdirection takes us beyond an individualized focus, and opens up for distributed agencies and systems working in concert.

Structural misdirection

Two recent publications outline how misdirection may be put to analytical use. First, in their work on the scientific standardization of intervention in malaria elimination, Peeters Grietens, Gryseels and Verschraegen develop the idea of a 'universalist sleight of hand' (2019: 390), occurring when interventions depend on and produce "decontextualised evidence by methodologies that exclude social variablity'" (Peeters Grietens et al., 2019: 390). Sketching the "underlying values and logics of daily scientific praxis in specific epistemic communities', these scholars describe a 'circular system of knowledge production [that] hinges on measuring universally valid characteristics of an intervention with methodologies that aim to produce non-contextual evidence" (Peeters Grietens et al., 2019: 400). In their analysis, attention is shifted -by the assemblage of data, evidence and intervention- to "new universal medical and biotechnological interventions' at the expense of 'localizable plausible solutions" (Peeters Grietens et al., 2019: 397). Using the idea of misdirection, these authors point to the way that the production of scientific data and global health evidence is shaped through the direction of attention to particular approaches (Peeters Grietens et al., 2019: 398).

Second, in 2018, Sarah Gimbel and colleagues published an analysis demonstrating that global health 'partnerships' were producing mechanisms by which data, as capital, was being "harvested from sites, passed between partners, used to audit and surveil systems, and ultimately deployed to

justify and promote subsequent rounds of project making and data gathering" (Gimbel et al., 2018: 80). All this data is not only laborious to produce, but is done so – as Gimbel et al. demonstrate – by solidifying existing disparities, as 'unequal power dynamics privilege donor priorities above local ones' (Gimbel et al., 2018: 94). Together, the facets of the article make evident how the 'need' for data is sustained; master narratives about data put the production of data above and "often at the expense of… under-resourced health systems" (Nichter, 2008: 2). As they marshal their examples to challenge this seemingly self-evident base of monitoring and evaluation, Gimbel and colleagues make evident that from the point of view of the recipients of global health funding, donors' needs for data "only grow, with new indicators or increasingly disaggregated metrics, each year more onerous to collect, report, disseminate and use locally" (Gimbel et al., 2018: 88). Their critique rests here: as energy, time and effort is poured into producing data on the efficacy of intervention, attention is drawn away from the capacities not being built, in reporting, statistics, and data more relevant to recipient countries' own priorities.

Both of these papers tackle the process by which knowledge about global health is produced, shaped and organized according to both method and international agreements, whether of standardized subjects or accountability demands. So what kind of 'structural misdirection' might be taking place here? When STS scholars attend to the production of evidence, they have sought to consider the settings and mechanisms by which it is produced. Following Peeters Grietens et al., we suggest that while magicians astound their audience through deception and performance, taking place explicitly and on center-stage, misdirection in global health can also unfold tacitly back-stage and can describe hidden processes and reveal covert and implicit tactics that are being deployed (c.f. Jones 2014).

This misdirection can be pursued as what Pedersen et al. (2021: 312) call an "irreducibly socially and materially mediated phenomenon". And rather than being achieved through the singular mind of a magician, misdirection within global health can be seen as dispersed, as entan-

gling individuals, structures, processes, and histories.

Processes of misdirection can underpin, then, the production of knowledge and shape action. As in Peeters Grietens et al.'s (2019) study of what is considered a possible direction for malaria intervention, misdirection shapes possibilities and impossibilities for action. Building on this notion of misdirection to examine knowledge production practices in global health, the contributions in this special issue aim to show how our attention is often focused on specific processes, practices, and outcomes while side-lining, 'invisibilizing', alternative methods, evidence, theories, and interventions (Peeters Grietens et al., 2019), thus creating an illusion of impossibility (Ortiz, 2006). Tracking processes of misdirection involves locating where the spotlight lands, what is left in the dark, what is revealed or made impossible, what kinds of actors and assemblages are involved, and what pathways are engendered or foreclosed.

This balance between the abstract and the empirically anchored will allow those interested in pursuing their own analyses to ask of novel phenomena: Is there a case of misdirection here? If so, who or what is misdirecting, who or what is being misdirected, what is revealed and what is hidden? Which aspects in misdirectional processes are intentional or unintentional, or a combination thereof, and what are some key effects? How does it play out temporally, materially, and geographically? What knowledge, memories, narratives and realities are created as a result?

The contributions

The contributions in this collection highlight three distinct aspects of the way misdirection can be used to pinpoint and illuminate what will count as global health knowledge and practice: interpersonal, narrative, and structural. Across the articles, which span the interpersonal and the global, our authors are concerned with questions of the efficacy of stories and the socio-material implications of knowledge making.

A first paper by Kuhn, Kingori and Peeters Grietens describes the concept of misdirection in the field of magic, showing that although misdirection lies at the heart of this deceptive art, there

is little consensus as to what actually defines the concept. The paper continues to discuss the key psychological mechanisms that are involved in misdirection and ends exploring some of the uses of misdirection in other domains such as politics and online deception. One element of departure from misdirection in magic in this special issue relates to the idea of intent. While misdirection in magic always implies intent, several authors in this special issue depart from this key aspect. In the Tribute to Dan Allman, for example, we describe how in Dan's work he used 'intent' as a lens through which to examine misdirection. He included involuntary or shadow misdirection in his examination of the construction of research in the pressured conditions of global knowledge production. Weighing the unplanned and the involuntary on the scale of intent, Allman found the limits of knowing about intentions in the 'risky business' of research.

Our second cluster of articles allow us to focus on the power of narrative in acts of misdirection. In their discussion of the regulation of herbalism in France and England, Emilie Cloatre and Nayeli Urquiza Haas trace a series of misdirections narrated both by herbalists and the regulatory and legal infrastructure. At stake is what will count as 'real' medicine, and at the forefront is the 'screen of apparent legal protection' which Cloatre and Haas systematically analyse. From illusions of legality to the production of the illegal, in this analysis misdirection is the artful way that the distributed actors of the legal system narrate a proactive intervention triumphing over competing claims to knowledge. This contestation over kinds of evidence appears in Keys's contribution, which expounds on the handling of malaria elimination in Santo Domingo, capital of the Dominican Republic. Framing misdirection as co-produced, Keys illustrates how narratives about poverty, stories told by hemograms, and the belief in the neutral narration of data combine to erase the local specificities of the malaria outbreak in the Dominican Republic, folding it into a global, unsited story. In their text which builds on placebo literatures, Phoebe Friesen and Emilie Dionne interrogate narratives of 'beneficent deception', asking how and where deception is justified in medical research and practice. Friesen and Dionne

focus their exploration on the role of story and voice in such cases, examining how stories told to justify these practices tend to offer clear narratives of beneficence, directing audiences away from who tends to be deceived, and who is given voice within these stories. Examining research involving children and high-tech "placebo machines", provocative testing used to stimulate pseudo-seizures in patients suspected of faking it, and dementia villages that recreate the past through hyperreal architectural design (Baudrillard, 1981), the analysis traces the often fraught and ethically challenging territory of deceptive medicine.

Misdirection as a form of erasure, particularly of structural inequalities, appears in our third theme. The universalist aim of Global Health and the inequalities it produces is apparent in Alenichev's contribution "Encountering semiotic misdirection in Covid-19 etiquette guides", showing how Covid-19 preventive measures and related public health materials inevitably project hidden norms and values on "standardized" people and communities, generating a seemingly universal etiquette (e.g., hand washing), that hides/ignores social, moral and material dimensions (e.g., the absence of running water) that may complicate these norms for targeted populations, leaving many people structurally shamed due to the unavoidable transgressions.

Misdirection as Achievement

While distinct in their scale, these papers demonstrate how the questions that misdirection produces can illuminate the stakes of global health knowledge and practice. In some cases, it is possible to identify actors shaping situations, in others, less so. Nonetheless, attention to misdirection can shed critical light on power: it probes questions of who steers the narrative, what stories are dominant, what and how counternarratives are made absent, and how attention is shaped. Its capacity to open backwards onto intention, to focus analysis on interpersonal engagement, and to force the identification of persuasion and distraction gives it a generativity that notions such as performance or performativity lack. At the same time, misdirection can be used to contest power. Fieldworkers in global health mobilize their misdirection skills as a tactic when facing adverse working conditions

that they have little power to change (personal communication Patricia Kingori and Rene Gerrets) while herbalists in France and the UK circumvent the law and navigate its ambiguities to be able to carry out their professions (Emilie Cloatre and Nayeli Urquiza, this issue).

Looking across the papers, we reflect on susceptibility to misdirection: are there specific subgroups, topics, or attractors of it? While this collection takes no geographic area as its focal point, future research might ask where specific genres of misdirection appear, how misdirection itself is (tacitly or otherwise) incorporated into strategies to deceive or how misdirection can be a strategically embedded pre-condition for the functioning of specific institutionalized processes. This is the case, for example, during the informed consent process where the fact that populations participating in research do not understand the pages-long technical language is strategically ignored; as is the fact that large part of populations do not distinguish between research and aid; that the large majority of participants decides to partake in research before hearing the consent information (Paré Toe, 2013); or that individual autonomy in the decision-making process that is claimed as the ethical standard is just not present in many contexts.

It remains an empirical question how misdirection 'works' in its various guises: what might scholars gain by pointing out what misdirection hides, such as the 'sleight-of-hand' processes that hinge on creating illusory 'choices', or illustrating how outcomes are predetermined (referred to as 'forcing' in magic (Pailhès and Kuhn, 2021) by adroitly manipulating/determining what is perceived as (im)possible?

Beyond identifying moments and sites, the papers also sketch out a politics of misdirection. As a number of the papers show, STS and global health scholars may be themselves drawn into practices of misdirection, knowingly or otherwise. Like the participation of a selected person in the audience of a magic show, chosen to validate the magic trick, global health researchers often express the feeling of being used to validate that what has already been decided, like in a magic trick when the "card is already on the table" and the outcome of the trick has already been scripted.

Here inheres the question of how misdirection participates in governance, and is itself governed. From questions of research ethics, where misdirection is incorporated deliberately into deceptive treatment (Friesen and Dionne, this issue), to the ambiguities that inhere in making claims to and regulating herbal medicine (Cloatre and Haas, this issue), attending to misdirection raises further questions. Scholarship in the cognitive and behavioural sciences is beginning to take up the production of wonder as a site of greater understanding of human minds, demonstrating that prior information about deception inhibits only some of the efficacy of misdirection (Kuhn and Tatler 2005; Kuhn et al., 2008; Kuhn et al.,2016). This raises questions for scholars: who should know how to do it, who should allow it, who assesses its impact on others?

By working with both the conceptual tool of misdirection and rich empirical data sets, it is our hope that this special issue will pave the way for future scholars to take up the concept of misdirection in their own work, incorporating it as a critical illuminator of the technologies, infrastructures, devices and assemblages that make up the field we know as global health.

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Misdirection – Magic, Psychology and its application

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Misdirection is magic and magic is misdirection.

(Hugard, 1960: 7)

Abstract

The art of magic relies on deception and illusions to create human experiences that appear impossible. Misdirection lies at the heart of this deceptive art, and yet there is little consensus as to what this concept aims to describe. The concept of misdirection is not limited to magic, and its principles are applied to wide aspects of our lives (e.g., politics, public health, marketing). In recent years, scientists have started to examine the psychological mechanisms that underpin misdirection and new theoretical frameworks have been developed to help understand the concept itself. This paper provides two different perspectives on misdirection. In the first section we will discuss its use in magic and examine some of the key features involved in using misdirection to create magical illusions. This section will examine some common misconceptions of misdirection. The second section will provide a psychological perspective that discusses the key psychological mechanisms that are involved in misdirection (perception, memory, reasoning). The third section examines the uses of misdirection in other domains. This paper aims to provide a clearer understanding of how misdirection is used in magic which can serve as the basis for its use in other domains, such as public health.

Keywords: misdirection, magic, deception, attention, psychology, cognition

Introduction

Stage magic is an artform that allows us to experience things we believe to be impossible (Kuhn, 2019). To do so, magicians rely on powerful psychological tricks and illusions that allow them to manipulate their audience's conscious experience (Kuhn et al., 2008). For thousands of years, magicians have perfected the art of deception (Lamont and Steinmeyer, 2018), and many of these principles have been applied to areas that go beyond the magician's stage (Kuhn, 2019). Hieronymus Bosch's 16th Century painting of the conjuror nicely illustrates the intersection between misdirection and the social world of deception (Figure 1). Here the conjuror skilfully misdirects his audience's attention to hide his secret actions. However, closer inspection of the painting reveals how the magician's misdirection also prevents a member of the audience noticing two pickpockets' stealing his pouch. Misdirection plays a fundamental role in the magician's armoury of deception, but misdirection has often been used for more less magical means. Throughout history, there has been a vibrant knowledge exchange between the world of magic and individuals/organisations seeking ways to gain an unfair advantage over others. For example, Victorian spiritualist frequently borrowed magicians' deceptive tricks to convince the public of their supernatural powers (Tompkins, 2019). Similar deceptive techniques have been applied by contemporary psychics (Marks, 2000), and politicians are often seen misdirecting the public on a much larger stage. Donald Trump was a true master of misdirection, and he effectively used his twitter account to command the political narrative of the world media. This form of political misdirection shares much resemblance with conjuring misdirection, and insights into the

Figure 1. The Conjuror, by Hieronymus Bosch c. 1502

nature of misdirection may provide effective ways of countering this form of deception. The concept of misdirection has been applied to fields such as politics (Freudenburg and Alario, 2007), Human Computer Interaction (Tognazzini, 1993), deception (Hyman, 1989; Jastrow, 1888), cyber deception (Malin et al., 2017) and, in this issue, global health.

The art of magic deals with some of the most fundamental questions about the human mind and culture (Smith, 2015), and as such has relevance to a wide range of disciplines. For example, During (2002) examined how modern magic emerged as a form of show-business that was distinct from the occult, and he illustrates how cultural contexts helped shaped this secular form of magic. Smith (2015) took this approach further and examined the intersection between science, technology, society and magic, both in terms of how magicians chose to frame their performances in the context of new scientific discoveries, as well as the deceptive principles being deployed. Smiths showed that stage magic provides a valuable tool to study how people perceive and learn about new forms of technology, and the deep entanglement between human and non-human agents. Even though magic is frequently discussed in the context of magical rituals and the occult (Sørensen, 2007), the art of stage magic (i.e. secular magic) has received relatively little systematic investigation. In this paper we will focus on the deceptive principles magicians use to manipulate people's experiences, rather than the experience itself that magic elicits. As we will see, these practices have important implications for our understanding of the nature of the human mind, and our relationship with technologies and society.

In recent years cognitive scientists have started to examine the psychological tricks magicians use to create these illusions, and scientific investigations into these principles provides insights into the ease by which our mind can be manipulated (Kuhn et al., 2008; Macknik et al., 2008; Rensink and Kuhn, 2015; Thomas et al., 2015). Misdirection is key to magic (Kuhn et al., 2014), which is why it has gained much interest from magicians, academics and others. Even though misdirection is central to magic, the concept itself is relatively

poorly understood and defined (Lamont and Wiseman, 1999).

Magic relies on preventing the audience from discovering the deception, and the magic community has worked hard to prevent the public from discovering how their tricks are done (Jones, 2011). The secretive nature of magic has prevented outsiders from accessing much of this knowledge, and this may explain why the nature of misdirection has received relatively little critical examination from outsiders. This in turn may explain why misdirection has been less thoroughly studied, and thus remains relatively poorly understood. However, in recent years academics have started to study magic empirically and systematically, and this science of magic has enabled new concepts about some of the fundamental aspects of this deceptive artform. In this paper we will examine the nature of misdirection and present ideas and concepts from a magician's perspective, and from a psychological perspective, and illuminate some of the key cognitive principles that underpin misdirection. In the final section we will highlight different areas where direct comparisons have been made between misdirection and other more applied forms of deception.

What is misdirection? - Magicians' perspective

Magic is a performing artform that allows you to experience things that seem impossible. Stage magicians use deception and misdirection to create experiences that violate our understanding of the world (Lamont, 2013). For example, as you witness the magician pulling a rabbit from their hat you experience a cognitive conflict between then things you believe to be possible (i.e. rabbits cannot materialize from nowhere) and the things you have just experienced (i.e. rabbit appeared inside what seemed to be an empty hat). Witnessing such events elicits a wide range of emotions, such as wonder, awe, surprise, astonishment, curiosity…(Lamont, 2017; Leddington, 2017). However, at the centre of this experience lies a cognitive conflict between the things we believe to be possible, and the things that we believe to have experienced (Kuhn, 2019; Leddington, 2016). Indeed, neuroscientific research shows that witnessing

such magical effects activates neural centres that are involved in monitoring more general forms of cognitive conflict (Danek et al., 2015; Parris et al., 2009).

Stage magicians create these magical experiences by using secret deceptive methods, which they typically refer to as the *method* to the *effect* (Lamont and Wiseman, 1999). A magical method might involve a secret compartment in the top hat, which allows you to conceal the rabbit inside what would otherwise appear to be an empty hat. It is important to note that the same effect can often be achieved through different means (Rensink and Kuhn, 2015). For example, the magician might misdirect your attention to prevent you from noticing how they secretly sneak the rabbit into the hat. Even though the method may be different, it should result in the same effect – a rabbit appears in the hat. The magician's main objective is for you to experience the effect without noticing the secret method that is being used to create the effect – the principle that allows them to do so is misdirection. It is important to stress that magic never happens without a cause. The magician's objective is to prevent their audience from noticing the true cause of the effect, and guide them towards endorsing the magical cause of the effect (Kuhn, 2019; Lamont, 2013).

Misdirection is central to magic, and it is difficult to envisage any magic trick that does not involve some form of misdirection. Randal (1976: 380), suggests that "[m]isdirection is a principle element in the art of deception", whilst Leech (1960: 6) refers to misdirection as "the meat of deception, the stuff of which illusion is made". Jean Hugard went as far as claiming that misdirection is magic and magic is misdirection (Hugard, 1960). Magicians have written countless books about misdirection and it is a concept that is frequently used to describe phenomena outside the context of a magic performance. However, the concept itself is still poorly understood, and prone to misconceptions by both magicians and the general public. Let us therefore examine the concept in more detail, and highlight some common misconceptions about misdirection regarding its use in magic.

Let us start by examining a popular definition of misdirection. Wikipedia (n.d) defines misdirection as "a form of deception in which the performer draws the audience attention to one thing to distract it from another". This idea of attentional distraction is commonly encountered in definitions of misdirection, and attention does indeed play an important role in misdirection. The human brain has a limited processing capacity, and thus rather than processing all perceptual information, our attentional system systematically prioritizes information that is of importance and ignores things that are less relevant. Within the context of a magic performance, there are lots of different things that occur simultaneously, and attentional distraction can prevent the audience from attending to the crucial detail and thus failing to perceive it (Sharpe, 1988). For example, an assistant riding a unicycle would provide ample attentional distraction to prevent the audience from noticing how the magician sneaked a rabbit into the hat. In this instance the misdirection would have successfully prevented people from noticing the method, but in doing so it will have distracted people's attention from the effect - noticing the magician pulling the rabbit from the hat.

Rather than simply distracting people's attention, misdirection typically involves guiding attention towards something interesting and relevant to the effect (Wonder, 1994). This is in contrast to how politicians often misdirect attention to distract from negative news stories. Boris Johnson's campaign adviser Lynton Crosby's "dead cat" manoeuvre is a good example of attentional distraction that is used as disguise. According to him

> There is one thing that is absolutely certain about throwing a dead cat on the dining room table. ... [E]veryone will shout, 'Jeez, mate, there's a dead cat on the table!' In other words, they will be talking about the dead cat—the thing you want them to talk about—and they will not be talking about the issue that has been causing you so much grief. (Delaney, 2016)

Throwing a dead cat on stage would certainly prevent people from noticing the magician sneaking the rabbit into the hat, but it would also distract

them from the effect – the rabbit appearing from the hat.

Misdirection is typically associated with guiding or distracting people's attention, but it is important to note that many misdirection principles do not necessarily rely on attentional process. As Leech (1960: 6) points out, "real misdirection deceives not only the eye of the spectator, but his mind as well". There are lots of misdirection principles that are independent of what people perceive. For example, Juan Tamariz explains how "a magician can create lagoons in the spectators' memories in order to make them forget whatever we wish for the magical effect, or to make them believe they remember things that in reality never existed." (Tamariz, 2012: 157). Other memory misdirection techniques rely on influencing how people remember an event, and this form of misdirection provides an extremely powerful tool to prevent people from discovering the true cause of the effect.

Other misdirection techniques rely on manipulating peoples' thoughts and reasoning. For example, magicians often give you the impression that a trick involves little planning, and these types of tricks are designed to appear impromptu (Teller, 2012). In reality, most magic tricks involve considerable preparation, and people typically fail to realize just how much work goes into creating them. Presenting a trick as if it is performed impromptu prevents the audience from considering more elaborate setups, and thus provides a valuable form of mental misdirection. Although attention plays an important part in misdirection, misdirection is a much broader concept than one may naturally assume.

Let us now look at the final, and possibly most important component of misdirection – your awareness of the misdirection. Misdirection is only effective as long as the audience fails to realize how they have been misdirected. Once you notice that your attention has been distracted, you will no longer experience the magical effect – now you attribute the cause of the effect to your inability to detect the method rather than the magical effect. Good misdirection must therefore be unnoticed, and occur naturally within the context of the performance (Lamont and Wiseman, 1999). Tossing a "dead cat" on stage will prevent you

from noticing the secret method, but since it is an obvious form of distraction, you will attribute the appearance of the rabbit to your failure in perception, rather than the intended magical cause. Once people become aware of the misdirection, the impossible becomes possible, and the magic disappears (Pareras, 2011).

Misdirection is central to magic, and yet it's a concept that is generally poorly understood. From the magician's perspective we can think of misdirection as any process that "directs the audience towards the effect and away from the method" (Lamont and Wiseman, 1999: 31).

What is misdirection? – psychological theories

Magicians have spent hundreds of years performing their tricks in front of live audiences, and this performance experience gives them great insights into how best to misdirect their audience. However, even though magicians know what tricks work, they may not necessarily know why they work (Kuhn, 2019). In recent years, scientist have taken a keen interest in studying magic because it provides valuable insights into some of the limitations of human cognition. Much of this science of magic endeavour has focused on misdirection, and many of the key misdirection principles are now being scientifically evaluated. This scientific research allows us to move beyond informal anecdotal descriptions and adapt a more systematic approach to misdirection. This interdisciplinary collaboration between magicians and cognitive scientist has led to new frameworks of misdirection, which not only explain which principles work, but also why they work.

In 1999 Wiseman and Lamont published the first psychological theory of misdirection, a framework that drew informal links between psychology and misdirection (Lamont and Wiseman, 1999). This informal taxonomy offered an important starting point as it tried to link magic practice to psychological processes. However, this theory lacked scientific rigour, and many of the psychological processes were rather loosely defined. In 2014 Kuhn et al. developed a new taxonomy of misdirection that was based on known and established psychological mechanisms (Kuhn et al., 2014).

Most previous theories focused on misdirection from the performer's perspective – The psychologically-based taxonomy of misdirection tries to explain how misdirection affects the spectator's mind. This new perspective allows us to draw direct links between misdirection and established cognitive mechanisms, and evaluate them scientifically.

The psychologically-based taxonomy of misdirection

The psychologically-based taxonomy of misdirection uses a rather broad definition of misdirection that encompasses any psychological principles that guides the audience towards experiencing the magical effect. According to Kuhn (2019) misdirection is an umbrella term that describes a range of psychological principles that are used to prevent the audience from discovering the true method and focuses the audience's attention to the magical effect. From a psychological perspective misdirection includes cognitive processes that manipulate people's beliefs about what they are experiencing. To do so effectively, misdirection exploits many of our mind's limitations. The key is that these limitations must be counter-intuitive, since once you become aware of them, you start attributing the effect to your limitations rather than the magical effect. Any effective misdirection principles must not only exploit people's cognitive limitations, but also failures in their beliefs about their cognitive processes, also known as meta-cognitions (Ekroll, 2019; Kuhn et al., 2014; Ortega et al., 2018, 2021). People often hold erroneous beliefs about their true cognitive abilities, and these errors in metacognition are a crucial component of any effective misdirection principle.

The psychologically-based taxonomy of misdirection has become an influential framework for examining misdirection and it is based on the notion that human cognition generally involves several different types of information processing. When watching a magic trick, the observer must first perceive the event sequence, and thus capture the relevant sensory information. The observer must then store key aspects of this information in memory, which is then used to reason about how the trick is done. According to Kuhn et

al. (2014) misdirection encompasses any psychological process that prevents the observer from attributing the true cause to an effect. To do so, the magicians can manipulate any of these three mental processes (Kuhn and Martinez, 2012).

The psychologically-based taxonomy of misdirection has three broad categories that correspond to the three broad types of cognitive mechanisms. The first category refers to procedures that manipulate perceptual mechanisms and have the potential to prevent people from noticing an event. Attention plays a crucial role in determining what aspects of the world that we perceive, and unless we attend to something, we are unlike to see it. All of the attentional misdirection principles fall within this category. For example, there are lots of techniques that misdirect a person's attentional focus either by external or internal triggers. For example, our attention is automatically drawn towards salient features (e.g. a bright light, loud sound, eyes) and such features are used to misdirect people's attention towards the desired objects and thus away from the secret method (Sharpe, 1988). Kuhn and colleagues (Kuhn et al., 2009; Kuhn et al., 2008) have shown that this form of attentional misdirection is extremely effective at preventing people from noticing events that are taking place in full view. For example, in several such studies, attentional misdirection is used to prevent people from noticing the magician from dropping a lighter and a cigarette in full view (Kuhn and Tatler, 2005; Kuhn et al., 2008; Land and Tatler, 2009).

Alternatively, magicians often orchestrate the narrative to manipulate the audience's internal motivation to attend to things. For example, magicians often use *patter* to talk about certain objects or events, which results in people's attention being allocated towards these objects without them necessarily being aware of it (Smith et al., 2013). These implicit suggestions can increase or decrease the level of attention given to something. For example, magicians may reduce the level of attention by making an object or event seem mundane. One of the key principles here involves familiarity – the first time you see the magician place a special prop on the table (e.g. a pair of scissors), you will become interested in the object and start attending to it. However,

if the magician uses them to cut a piece of rope in half several times, the audience will become familiar with the object and thus start to pay less attention towards it.

Just as we control what object we attend to, we can also focus our attention on particular moments in time (Barnhart et al., 2018; Fraps, 2014). There are huge fluctuations in how we process information over time, and magicians exploit these natural fluctuations or induce them to ensure that their secret method is carried out during time points where their audience is less attentive (Wiseman and Nakano, 2016). For example, a joke, or surprising event typically elicits a strong emotional response which and magicians suggest that this is followed by an attentional relaxation (Macknik et al., 2008). People are less likely to notice events that take place during these natural relaxations in attention, which provides a perfect opportunity to carry out the secret methods without it being noticed.

The final form of attentional misdirection relates to our overall attentional resources. Our attentional recourses are limited, and people who engage in attentionally-demanding tasks often fail to notice extremely obvious events, a phenomenon known as inattentional blindness (Mack and Rock, 1998; Simons and Chabris, 1999). For example, Chabris and Simons (1999) have shown that if people were asked to count the number of times basketball players pass a ball from one player to the other nearly 60% of participants failed to notice a gorilla walking across the screen. This principle is frequently exploited in misdirection whereby the magician may ask the spectator to engage in a complex task, which will deplete their attentional resources making them less likely to notice other things going on (Smith et al., 2013). This is also one of the main reasons why magicians avoid repeating the same trick. Observing a trick for the first time requires more attentional resources than when it is perceived the second time round. Indeed, empirical work has shown that people are often more likely to discover the secret when the trick is repeated (Ekroll et al., 2018; Kuhn and Findlay, 2010; Kuhn and Tatler, 2005; Kuhn et al., 2008). Magicians also often introduce a sense of confusion by having lots of different things going on simultaneously,

which depletes attentional resources and thus prevents spectators from noticing the secret.

The second main category of misdirection principles relate to how people remember an event. Perceiving an event does not imply that you will remember the event. Only a tiny fraction of the information that we perceive can be recalled later from memory and even remembering an event does not necessarily imply that you have experienced it in the first place. Our memories are highly selective reconstructions, that are based on fragments of remembered experiences, rather than complete representations. Hence lots of misdirection techniques are designed to manipulate how people remember an event.

Most of the memory misdirection techniques try to ensure that the audience forgets the relevant information about the magic method. There are several ways in which this can be achieved. For example, people are more likely to remember an event if they are immediately asked to recall it, rather than later on. The magician may therefore include a time delay between the method and the effect, which is known as time misdirection (Fraps, 2014; Leech, 1960). Another effective principle that can be used to prevent people from remembering the relevant details involves creating confusion. It is highly unlikely that people can remember all aspects of a complicated magic routine, and this ensures that they won't remember the crucial detail that are necessary to work out how the trick is done.

Most people intuitively assume that our brain encodes information so that it can be replayed in its original form, like a video camera (Chabris and Simons, 2009). Our memories are based on reconstructions rather than the accurate retrieval of information, which means that our memories are far less stable than we intuitively believe they are. There are lots of misdirection techniques that exploit the fluid nature of memory by controlling and influencing this reconstruction process. This can result in people misremembering entire event sequences. For example, people often misremember related event sequences as actual sequences simply because they appear related. In the context of a card trick the spectator might misremember a false shuffle (one that does not mix up the cards) with a real shuffle, which has an

entirely different function (the cards are genuinely mixed up).

Suggestions can also be used to influence people's memory and change the way events are later remembered. Elisabeth Loftus has conducted much pioneering works showing that individual words or phrases can alter memories and even induce memories for events that have never been experienced (Loftus and Hoffman, 1989). Magicians frequently exploit such memory distortions and use verbal and non-verbal suggestions to alter how people remember an event sequence. For example, Wiseman and Greening (2005) have shown that verbal suggestions given at the time a spoon was bending resulted in people falsely remembering that the spoon was still bending when it was in fact static on the table. These types of memory distortions are often exploited in the context of a séance, and some of the earliest work on memory documented how these memory distortions can be exploited by spiritualists (Hodgson and Davey, 1887). Magicians will often include critical misinformation (e.g., that you shuffled the cards) when recapitulating the magic performance to change the way the events are remembered – you falsely remember shuffling the cards. Indeed, unpublished research from our lab shows that verbal suggestions about who has shuffled a deck of cards can significantly alter to way in which the even sequence is later recalled. People often cannot distinguish between veridical memories and these false memories, which provides magicians a tool to rewrite the past, making it a very effective form of misdirection.

The final category of misdirection involves reasoning. Each member of the audience brings along a different set of pre-existing beliefs and assumption about the nature of the world, and the magic performance. Even though some of these assumptions are correct, others are not, and lots of misdirection principles manipulate these assumptions. It is beyond the scope of the current article to examine each of these assumptions, but we will highlight a few to illustrate the principle in more detail.

The theory of false solution is a principle in which the magician presents the audience with an obvious, yet false solution to the trick, which later is revealed to be wrong. For example, in one experiment participants were shown a simple magic trick in which the queen of hearts invisibly travelled from a deck of cards into the magician's pocket (Thomas et al., 2017). The method was simple – the magician used a duplicate card which had been placed in his pocket at the beginning of the trick. Indeed, when performed like this, 80 % of the participants correctly identified this simple method. However, when the magician added a false solution, participants struggled to identify the method. Here the magician pretended to palm a card from the top of the packed, but immediately destroyed this as a potential solution by revealing that his hand was empty, before it reached into the pocket to reveal the other card. This false solution prevented participants from discovering the simple solution to the trick - a duplicate card. The theory of false solution is a powerful form of reasoning misdirection (Thomas and Didierjean, 2016) that is related to the Einstellung effect (Luchins, 1942) whereby people are reluctant to abandon a false solution despite knowing that it is false, and prevents people from considering alternatives. This principle has been found in domains outside magic, such as chess problems, in which expert chess players fail to abandon a suboptimal solution even if better alternatives are available (Bilalic et al., 2008).

The Ruse is another effective way in which people's mind can be prevented from discovering the solution to trick. Simply putting your hand into your pocket may seem suspicious and attract attention. However, using a ruse to justify the action (e.g., reaching in to my pocket to fetch some magic dust) will make it seem less suspicious and thus people will take less notice of it (Van de Cruys et al., 2015). Van de Cruys and colleagues have argued that people simply cannot represent an action has having two simultaneous, yet different functions. Therefore, an action such as placing your hand in your pocket can only ever be represented as a putting action (e.g., dropping a secret prop in my pocket) or a fetching action (picking up magic dust), but not both. Once an action has been justified as an action that is mutually exclusive to the to be concealed action, our mind will struggle to entertain the alternative action.

Most people assume that a magic trick has a single pre-determined end. However, magicians

often perform tricks that have several possible endings, which allows the magician to choose between them depending on what choices have been made. This principle of multiple outs is often used in mentalism and forcing (Pailhès and Kuhn, 2021). For example, the magician might have multiple predictions for four different outcomes, and simply reveal the one based on the spectator's choice. The multiple out principal exploits people's erroneous assumptions about the nature of magic trick in that they are all presumed to have a predetermined end.

The psychologically-based taxonomy of misdirection highlights and isolates a wide range of psychological principles which has helped identify the cognitive mechanisms that underpin them. However, it is important to note that magicians rarely apply these principles in isolation. In a typical magic performance, the magician will deploy several of these misdirection principles simultaneously resulting in complex layers of deception that complement each other (Olson and Raz, 2021). Indeed, unpublished research from the MAGIC lab shows that combining different deceptive methods simultaneously prevents people from working out relatively simple deceptive principles. In this study participants were asked to watch a demonstration in which the magician held up cards which he subsequently named. If one deceptive method was applied alone (marked cards, transparent blindfold), participants managed to work out the deception easily. However, combining the two methods made them virtually impenetrable.

Bayesian approach to misdirection

Grassi and Bartels (2021) have recently proposed a Bayesian approach to misdirection which uses a computational approach to explain how each of these different cognitive processes affect the way in which magicians can manipulate the observer's beliefs away from the real cause of the magic effect (i.e. the method) and accept the alternative beliefs about the effect (i.e. the magical effect). Bayesian predictive coding is a computational framework that is typically used to explain perception. Our senses receive lots of incomplete and often ambiguous sensory information about the physical world and making sense of this informa

tion poses huge computational challenges. To do so effectively, our brain employs prior knowledge to resolve these ambiguities which helps us make sense of this fragmented information. We acquire this prior knowledge by learning statistical regularities about the world, and we can use these priors to predict the most likely cause of the incoming sensory information. Bayesian inference is a mathematical principal based on probability theory that combines the observed information (i.e. likelihood) with probabilistic predictions that are based on previous beliefs (i.e. prior beliefs) to calculate the most likely interpretation of the event (i.e. posterior probability). The difference between our prior beliefs and the incoming sensory information is known as the prediction error, and we use this prediction error to update our beliefs about the world.

Bayesian predictive coding theories view the brain as a system that maximizes the evidence for its world model by minimizing the difference between its prediction (prior beliefs) and the sensory data. To reduce this prediction error, we can update our beliefs about the world and/ or change our interpretation of the sensory data. This process of reducing prediction errors is seen as the basis of all human learning and this model has been applied to numerous cognitive processes. Grassi and Bartels (2021) have applied Bayesian predicative coding to explain misdirection, and this new model provides an effective way of explaining how misdirection principles interact with our current beliefs about the world. Grassi and Bartels (2021) argue that magic is best explained in terms of surprise, and an individual's level of surprise can be operationalized as the difference between our prior beliefs about the situation and the incoming sensory information – prediction error. For example, it is very unlikely that rabbits appear from nowhere, and thus our prior beliefs about this occurring are extremely low. Seeing a rabbit appearing from a hat results in a huge prediction error between our expectations (i.e. priors) and the incoming sensory information, which in turn results in the phenomenological experience of surprise.

Grassi and Bartels' Bayesian framework relies on a relatively broad definition of misdirection that incorporates any process that manipulates

the audience's beliefs away from the real cause of the magic effect and misdirection is intended to guide it towards an alternative belief. Accordingly, misdirection intends to maximise the level of surprise that the trick elicits by maximizing the prediction error. Bayesian predictive coding models explain how this can be achieved and it also provides mathematical tools that in principle allow us to calculate the effectiveness of such principles. According to this theory magicians can increase the level of surprise a trick elicits by either shifting an individual's expectations (i.e., prior beliefs) or by shifting the sensory information. This model of misdirection does not conflict with previous approaches (e.g. Kuhn et al., 2014; Lamont and Wiseman, 1999), but it shifts the focus from the individual misdirection principle towards a process by which our prior beliefs affect the misdirection principles themselves, and it highlights how magicians manipulate our prior beliefs.

Grassi and Bartels' model acknowledges the important role that attentional control plays in misdirection, and they see its role in terms of modifying the prediction errors in favour of those that maximize the mismatch between expectations and observations (i.e. surprise). There are two ways in which magicians can control their audience's attention to achieve this. Firstly, attention can be manipulated to prevent viewers from detecting the secret method (e.g., magician sneaking the rabbit into the hat) which would result in a reduced prediction error. Secondly, magicians control the audience's attention to highlight the strength of the efficiency that supports the trick, and therefore increases the spectator's confidence in having observed all of the relevant information, which in turn increases the level of surprise that the effect elicits.

The psychologically-based model of misdirection (Kuhn et al., 2014) is helpful in identifying individual misdirection principles, and it allows us to illuminate the cognitive mechanisms that underpin them. However, this model fails to explain how our prior knowledge and experience influence the effectiveness of each of the misdirection principle (Kuhn, 2019), nor does it tell us much about how they interact with one another. Grassi and Bartels's Bayesian predictive coding model makes specific predictions about

how these principles interact as well as how our prior knowledge affects them. Moreover, this computational model potentially allows us to directly implement the principle in the brain and thus enables us to make important connections to neurophysiological processes. To date, the Bayesian predicative coding model has not been empirically evaluated, but it certainly offers a step in the right direction.

Misdirection is a principle that lies at the heart of magic, and much of the research on misdirection has focused on the psychological mechanisms that underpin misdirection. Advances in cognitive science and the science of magic are providing new insights and perspectives on the issue. The concept of misdirection is also widely used in other domains, and in the next section we will examine how misdirection is being applied to other domains.

Applying misdirection to other domains

Deception lies at the heart of magic as well as many other human activities, and it is therefore no surprise that misdirection has been used to deceive people in other domains (Kuhn, 2019). Misdirection provides an effective model of deception and has plaid an important role in more formal theories of deception (Hyman, 1989; Jastrow, 1888). For example, in his memoires, Robert Houdin recounts how the French government called upon his conjuring skills to help suppress the Algerian colonial uprising (Robert-Houdin, 1859). In a similar vein, British Magician Jasper Maskelyne allegedly used his misdirection skills to deceive the German forces in World War 2, by using misdirection to vanish the port of Alexandria, and hiding the Suez Canal from view. These examples have received much public attention, but there is little actual evidence suggesting that these acts ever took place (Allen, 2007; Lamont and Steinmeyer, 2018). Instead, these stories are instances where magicians either used misdirection to misdirect the public about their legacy (Lamont and Steinmeyer, 2018), or government agencies misdirecting the public about their true capabilities.

In the 1950's the CIA did commission the American magician John Mulholland to write a manual outlining different ways in which conjuring deception and misdirection can be used by CIA field operatives to poison enemy agents as well as many other elaborate forms of deception (Melton & Wallace, 2009). It is unknown as to how much impact this manual truly had in the field, but it illustrates how principles of misdirection can potentially be applied to other domains. Indeed, the connection between misdirection and real-world deception is most prominently felt in the world of cyber deception.

Arthur C. Clark suggested that "any sufficiently advanced technology is indistinguishable from magic," (Clarke, 1999, ch. 2) and there has been much interest in exploring links between the digital virtual world, and the misdirection principles deployed by magicians to create their own illusory experiences. In 1993 Togazzini (1993) published an influential paper that highlights many of the similarities between human computer interface designers and the art of magic, and Togazzinis suggested that insights from magic could help human computer interface designers create more immersive and compelling user experiences. There are clear parallels between these two domains, and misdirection principles are frequently used to guide the user's attention through complex visual displays to enhance the ease by which information can be accessed and thus enhancing the overall user experience. More recently, this connection between misdirection and the online world has been explored in the world of cybercrime.

Magicians use misdirection to change people's perceptions and beliefs, and alterations of beliefs and perceptual experiences are also important components of cyber deception. There is a clear resemblance between the tools used by cyber-criminal to defraud an individual into handing over sensitive information, and the principles magicians use to elicit such information as part of a magic trick. Law enforcement agencies have therefore become interested in the connections between the magician's skilful use of misdirection and cyber threat actors who intend to circumvent human defences (Malin et al., 2017). Malin and et al. (2017) conducted a thorough analysis

of previous misdirection theories (Fitzkee, 1945; Lamont and Wiseman, 1999; Sharpe, 1988) and examined ways in which such principles are being applied by cyber criminals. For example, the principle of repetition is frequently used by magicians to familiarize the audience with objects or actions so that they attract less attention in the future. This principle of repetition is often applied in the digital online world. We visit websites and we have learnt that the most basic ubiquitous navigational action is to click on a link or button presented to us. We have repeated this action thousands of times making it virtually automatic, which means that it requires very little conscious attention. Malicious online actors take advantage of this behaviour to distract us from carefully examining the details of the web page that might tip us off that there is something amiss about the website. Malin et al. (2017) cite countless other example, that highlight the similarities between the deceptive principles deployed by cyber criminals and conjuring miserection, and this connection certainly warrants further investigation.

Henderson and colleagues (Henderson et al., 2015) also highlight how misdirection and magic deception principles resemble many of the tricks deployed by hackers in the world of intelligence and cyber security. Their case study illustrates how cyber criminals can operationalize misdirection principles to gain access to sensitive information, as cyberworkers try to make sense of complex, dynamic and uncertain scenarios that closely resemble a magic trick. Their case study particularly highlights how a single cyberattack episode often involves multiple strategies and forms of deception, that are combined in a similar fashion to how magicians combine their multiple forms of misdirection.

Politicians are often accused of misdirecting the public, and political distraction forms a central part of most political campaigns. When Boris Johnson was recently questioned about his attendance of a party at Downing Street, whilst the rest of the public was banned from social mixing, and he was quick to deflect the question and talk about his government's effective vaccine rollout. Such forms of political misdirection are widespread, and Freudenburg and Alario (2007) put out a call to examine the relationship between

political discourse and misdirection more closely. Whilst most sociologist have focused on how "tradition" and "culture" have influenced the political discourse, Freudenburg and Alario suggest that more attention should be paid to how misdirection is used to prevent the public from fully perceiving the political discourse. In their article Freudenburg and Alario (2007) link some of the principles used by politicians to the conjuror's concept of misdirection. Their main focus is on attentional distraction for the purpose of disguise, and reframing arguments to alter people's memories of the political discourse.

Governments frequently use distraction to prevent the public from taking notice of the true impact that a particular set of policies have. For example, Dennis (2019) suggests that one of the best ways for governments to disguise high-taxing policies is by drawing the public's attention to large tax cuts that are being done for the highest earners, whist cutting welfare spending and keeping lower tax bases unaffected. This form of misdirection is effective in that these tax cuts have a relatively minor impact on the overall money that is being collected, and whilst the net effect results in fanatical surplus, the government can be seen as supporting lower taxes, and protect the interest of the rich.

Political misdirection often involves reframing questions as a form of misdirection that allows politicians to manipulate the political discourse (Freudenburg and Alario, 2007). Much of the literature suggests that the mass media have a relatively small impact what people think, but instead that they are particularly effective at manipulating what people think about (Iyengar and Kinder, 2010). Within this context, the questions can form a potent form of misdirection that allows politicians to reframe the political discourse. Freudenburg and Alario cite a powerful example surrounding the anti-Vietnam war movement, which describes how skilful politicians raise questions to reframe the argument and misdirect the political discourse. As peace activists marched the streets, politicians were unable to simply ignore these protests, and therefore needed a way to misdirect the public's attention away from the issues raised. An extremely effective way of doing so, is to change the question that was most salient

about the issue (i.e., the detrimental social impact of the war), whilst continuing to talk about the issue (i.e., the war). This form of political misdirection allows politicians to alter the narrative in the main stream news. During the peace marches, politicians proclaimed that they support the troops, which implies that the protesters do not (Beamish et al., 1995). Subsequent analysis of the media coverage showed that this simple rephrasing of the question changed the focus of the discussion from the protester's concerns about was and destruction to whether the protesters were being unpatriotic or were undermining the troops in the field. Political spin is an important tool in the politician's handbook, and the connections between such forms of deception and misdirection are clear, and a fuller analysis may make us better equipped counter misdirection.

There are lots of other areas where principles of misdirection are applied to the real world. For example, Ekroll and colleagues how shown how some of the psychological principles underlying magic tricks may be relevant for understanding traffic accidents (Ekroll et al., 2021). Leathley (2019), has shown how misdirection principles can help us understand health and safety issues more generally. Misdirection has also been applied in health settings where it can be effectively used to in pain management (Bagienski and Kuhn, 2019, 2020).

Recently, in the field of global health, Peeters, Gryseels and Verschraegen (2019) have used the term misdirection to refer to processes by which attention is diverted from certain scientific approaches that do not fit the hegemonic malaria elimination paradigm to favour universalistic biomedical and biotechnical interventions. More concretely, the authors look at how the use of vector control tools, such as bed nets and topical repellents, is measured and how the success of related interventions is evaluated, drawing attention to standardized metrics while diverting attention away from social context, local variability and the potential of localizing interventions. The papers presented in this special issue will further the discussion on misdirection in global health.

Our discussion of how misdirection is applied in other domains is not intended as a full review

of the field, but instead as examples of how these conjuring techniques can translate to other fields.

Conclusion

Magicians have vast experience in effectively manipulating people's perceptual experiences. The scientific study of misdirection has helped unravel the many layers of misdirection that magicians deploy to deceive their audiences, and it has helped identify the mechanisms that underpin these illusions. The secretive nature of magic often prevents outsiders from drawing parallels between misdirection and other forms of deception. The science of magic has helped facilitate the knowledge transfer between magicians and scientists, and in this article, we shed light onto the some of the core misdirection principles and explain their use in magic and beyond. Most people have a rudimentary understanding of how basic attentional misdirection can be deployed to prevent people from noticing things. However, misdirection goes beyond simply distracting your audience and many of the lesser-known principles are particularly relevant to wide aspects of our lives.

Misdirection relies on exploiting often surprising and counterintuitive limitations and biases in cognition, and these processes are not restricted to performing magic tricks. Instead, they highlight cognitive processes that underpin our everyday behaviours, which makes them relevant to most aspects of our lives. As we have seen, misdirection strategies are being used, and abused in many aspects of society and technology. By examining the cognitive mechanisms that underpin these misdirection principles, we can move beyond simple descriptions, and start to explain how and why they work so effectively.

Misdirection is central to magic, and yet, it has received relatively little systematic examination from magicians or academics. The science of magic provides a new perspective on misdirection, and it has helped highlight some common misconceptions. The scientific study of misdirection is still in its infancy, but in the last decade we have seen huge advances in our understanding of misdirection. Misdirection is not limited to magic, and its use in other domains raises important questions about the nature of misdirection itself. The science of magic has provided a working definition of misdirection, as applied by magicians, and its use in other areas may shed new light on the concept itself.

Most misdirection principles exploit deep rooted psychological processes, and it is often impossible to counter their impact. However, awareness of our limitations and biases, and understanding how misdirection is applied on personal and societal levels can help us change our behaviours and devise policies and strategies to counter this form of deception.

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Misdirection and the Regulation of Herbalism in France and England

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Abstract

In this paper, we propose to explore how the regulation of herbalism, in France and in England, rests on series of 'misdirections,' with the coexistence of law and herbalism depending on multiple magical illusions. Attempts to regulate herbalists, and the responses they invite, involve multiple sleights of hands both by the law and by herbalists. Herbalists perform misdirections to maintain an illusion of legality, even where they bend legal rules that they deem incompatible with their practice. But far from being the only, or even the most effective, tricksters, herbalists are only one set of performers in a more complex layering of legal illusions. The regulatory and legal infrastructure itself relies on misdirections enacted through everyday legal procedures that trick the general public into believing that the law is 'acting' to protect vulnerable consumers from dangerous healers and their medicines, while the effects of its actions may be to tolerate, or indeed produce, zones of illegal, or 'barely legal,' practices. At the same time, this performance is enabled by playing a disappearing act, in which the knowledge of herbalists, and the demands of their users, are disappeared behind the screen of apparent legal protection. Drawing attention away from competing claims to knowledge, and towards its protective intervention, the legal system thereby embeds misdirections of its own kind.

Keywords: Herbalism, legalities, misdirections, science and law

Introduction

In this paper, we explore the regulation of herbalism, in France and England. We focus in particular on the tensions, mishaps, and frictions that the process creates, reading those as misdirections: crafted gestures that direct the gaze towards some action to make others less visible, enabling the disappearance of objects, practices and political claims. Since those who heal with plants have

historically been considered as both powerful and threatening, herbalists have for long been seen as a profession in need of regulation. Yet, recent attempts to create new rules for herbalists, and the responses offered, involve multiple sleights of hands. On the one hand, the regulatory and legal infrastructure relies on misdirections enacted through everyday legal procedures that create a

perception that the law is 'acting' to protect consumers from dangerous healers, even when it is not clear that this is its effect. On the other hand, some herbalists perform misdirections of their own in response to the rules meant to restrict or regulate their excesses, deploying minor disobedience as part of a toolbox of discreet activism. In the end, who is tricked and by whom is not easy to discern, and intentionality is itself difficult to capture: those who acknowledge that their own action involves some dissimulation see this as incidental to a different kind of meaningful process; others follow a quasi-ritualised procedure, where the disappearance is embedded into the politics of law itself. To explore those tensions, we approach the concept of misdirection as a heuristic to identify practices that may be construed as creating illusions of visibility and invisibility.

Exploring the difficult negotiations of herbalism with the law in France and England, we suggest that rules misfire in both countries, producing zones of illegality and of 'barely legal' practices, each with their particular characteristics. In France, the criminalization of herbal medicine practice by anyone other than a pharmacist has meant that herbalists always operate on the border of il/legality. When rules are bent (or more explicitly broken), it is not necessarily ill-intended, but an inevitable aspect of trying to work within restrictions that makes herbalist practice almost impossible, threatening its sustainability. In England, ambivalence towards herbalists' knowledge has materialised into regulatory mechanisms which some factions considered to be mere bureaucratic 'smoke and mirrors.' Herbalists are tolerated and their practice survives within the narrow confines of a tightly defined legal exemption. And while most strive to comply with the law, and work within its boundaries or close to the edge, they are sceptical about its effects. The examples in this article explore the intricate rules that relate to the kind of products herbalists are allowed to sell, and how those products should be prepared, packaged or labelled; the advice herbalists can (or must) provide; requirements around place of sale and consultations and, to some extent, professional regulations. While some of these rules are very clear, others are less so, creating a wider zone of malleability and opportunities for negotiation,

avoidance, or simulation. Whereby herbalists may be seen to more directly trick and distract, to offer a neat version of compliant action to legal agents who oversee their practice, the legal system also operates its own misdirections. Those are more layered, involving both displacement and the embedding of techniques of distraction, where intention and routinised performance are difficult to distinguish, yet herbalists' particular epistemological and political claims disappear. The examples we use to illustrate these include the disconnect between the law on paper and the everyday tolerance of minor disorder; the invisibility of herbalists' knowledge in debates around professional regulations and the sale of medicinal plants; and, in England, the regulatory illusions produced by the bureaucratic management of herbalists as a profession.

As we map these misdirections, we endeavour to show the possibilities, limitations and complexities of the interface between regulation and everyday healthcare practices at the crossroad of contested science and fragile legalities. The analysis builds on scholarship at the crossroad of STS and socio-legal studies, interrogating both the everyday practice of law in healthcare and the interface between law and scientific knowledge. It also engages work on law and magic, that has challenged the law's ascribed identity as a pillar of rationality: in that respect, it echoes some of the concerns of law and STS scholars in interrogating the nature of knowledge in legal processes, while emphasising the ritualised processes that, in our case study, facilitate the disappearance of competing claims.

Methodology

The forthcoming discussion is based on an analysis of the contemporary legal debates surrounding herbalism in France and England, both in formal legal settings and herbalists' everyday practice. We rely on a mixture of legal and documentary analysis, and semi-structured interviews. Moments of increased political activity have generated significant documentary data, in the form of regulatory texts, policy reports, and parliamentary debates, initiated over slightly different periods in France and England. In England, these

debates arose in the aftermath of a 2001 House of Lords Science and Technology Select Committee Report- which explored more broadly the regulation of Complementary and Alternative Medicines (CAM) in the UK- and concluded in 2014 after it was decided they were not ready for statutory self-regulation. In France, the debates arose in the context of two Senate Commissions- in 2012 and 2018- that re-opened former conversations about whether the State allow herbalists to professionalise and self-regulate, and how it should regulate the sale of medicinal plants. As well as policy documents, these events triggered numerous public reactions from herbalists via numerous blogs, online material and grey literature, and some media coverage, that we also reviewed.

Alongside written material, we rely on semi-structured interviews with 25 people, conducted between 2017 and 2019. Participants were selected for their involvement in relevant legal debates, or because of their oversight of the professional regulation of herbalists. They comprised of representatives of herbalists associations in England, and the main schools of herbalism in France (which, as well as their role in training and education, have been at the forefront of campaigning on behalf of the profession); representatives of regulatory agencies (in England) and parliamentarians (in France); and, through snowballing, individual herbalists who had been involved in relevant debates. Finally, this research is part of a broader project on the regulation of traditional and alternative medicine, that informs some of our analysis.

Law, science and misdirections

Herbalism has been part of the healing landscape in France and England for centuries. Even as biomedicine has settled as the primary healthcare resource, medicinal plants continue to attract interest (Garreta, 1998). Herbalists thrive to be seen as the main experts of medicinal plants, but their place is unsettled: in France, they have no formal recognition as a profession, and much of their activities are seen as intruding on the spaces that are legally reserved to pharmacists (or doctors) (Campion, 2003; Bost, 2015). They straddle the boundary between legality and illegality, remaining within the former only as long as they

abandon some of the core constituents of herbalist traditions (Adams, 2002; Cloatre et al., 2021). In England, the position of herbalists vis-à-vis the law is less fragile, and they benefit from a zone of tolerance via exemptions to medicines laws. At the same time, efforts to be formally regulated (and thereby recognised) as a healthcare profession has failed, denying in the process some of the particularities of herbalists expertise. As they continue to negotiate their place within the legal system, contemporary herbalists also defend a particular model of healthcare and a particular socio-political vision in which narratives of nature are layered over matters of health (Elzière, 1986; Garreta, 2007; Grisoni, 2012). Looking more closely at the relationship between herbalists and their regulation reveals a series of misdirections, sleights of hand that disguise or displace claims, actions and politics.

These movements are shaped by the social and epistemological particularities of herbalism, while echoing the broader, complex and sometimes uneasy, relationship between CAM, state institutions and biomedicine that others have pointed to (Adams et al., 2005; Brosnan, 2015, 2017; Vuolanto, 2015, 2018; Wahlberg, 2015). Both in France and England, contemporary herbalism has negotiated its identity with and beyond science: notwithstanding some diversity in individual positioning, herbalists have engaged with scientific knowledge and practices to demonstrate the technical validity of their practice, while retaining a certain attachment to tradition and nature in their discourses (Bost, 2015). Like other CAM professions, they have also sought to define a cohesive professional identity, even if such effort has at times been hampered by the diversity of their practices and epistemological standpoint (Brosnan 2017; Stöckelová and Trnka, 2020). Despite these efforts, public discourse has sometimes continued to reduce herbalism to a more straightforward form of popular practice, based on less rational beliefs than science. For example, a French Senatorial report on complementary therapies stated clearly that to be considered 'medical' in the eyes of the law, these therapies should become "a haven of rationality from which magical beliefs should be banished" (French Senate, 2013: 7). Most contemporary herbalist associations would reject the

characterisation of herbalism as an extension of magic, a label that responded to another historical period when the use of herbs by female sages had been considered the work of the devil (Manderson, 2005). Instead, herbalist associations in England and France today emphasise their likeness to pharmacological sciences and to health practitioners who follow diligently a professional code of conduct (Banerjee, 2009; Evans, 2008; Vanmarie, 2002; Wadell, 2019). They often make the case that herbalism has a scientific basis, but one that has yet not been demonstrated through the exigencies of the medical and pharmaceutical industry and regulatory apparatus (Dreher, 1983). By adopting the codes of science and the medical profession, herbalist practice has sought to cement its legitimacy, including vis-à-vis legal institutions (Wahlberg, 2008). On this basis, in England and France, professional associations have endeavoured to convince ministers, legislative bodies and medical authorities that herbalism has sufficient scientific credentials to be regulated as such. At the same time, many herbalists, in their individual capacity, insist that herbalism is not purely reducible to science, emphasising instead its harnessing of the powers of nature, and a different kind of ethos of care, a message also echoed by some of the schools or associations when describing their approach (Bitcon et al., 2016; Scottish School of Herbal Medicine, 2021; Wadell, 2019). In this way, contemporary herbalism overlaps with scientific narratives, while also proposing an alternative vision of the interface between nature and healing, and between plants and humans, that is not reducible to scientific rationalities. How herbalists negotiate this duality is a matter of shared as well as individual practice: associations and individual herbalists adopt nuanced stances, from outspoken positioning within scientific discourse, to some emphasising their difference, echoing imaginaries of tradition, or, in some cases, of magic itself. Responses from policy actors similarly locate herbalism in different discursive registers, within or away from science.

This ambivalence of herbalism – perceived or enacted – partly explains the frictions that can exist between herbalism and law. Arguably, modern law has been built on a powerful assumption that it was first and foremost an exercise in rationality and foreseeability, and one of the pillars of contemporary states keen to shake off any remnant of their premodern, less rational selves (Pękala and Stępień, 2012). Laws and norms are assumed to be guided by objective, unemotional and provable knowledge and similarly applied coldly and systematically: their legitimacy is based on this understanding that they are objectively informed, transparent, and built on provable knowledge (Conaghan, 2013; Norrie, 2013). Legal norms are presented as having shed their magico-religious origins and instead, 'modern' law is tied to the rule of rational democratic governments (Ziolkowski, 2003). But this has also meant that the law struggles to engage with practices that are not perceived as rational in this way. The difficulties for contemporary states to regulate witchcraft is maybe the most striking example of such difficulties (Geschiere, 2019; Petrus, 2010; Pharr, 1932; Roberts, 1935), but because of its ambivalent positioning, herbalism has posed a more discreet, yet partly comparable, set of frictions.

In its effort to position itself as a pillar of rationality, the legal system heavily relies on scientific knowledge and evidence. Legal authorities engage with numerous forms of scientific expertise to provide reasoned decisions, that are presented as the logical outcome of factual constraints, rather than the outcome of a political process (Jasanoff, 1990, 1995). Yet, in the way that STS scholars have approached science, and the relationship between sciences and complementary medicines, as the effect of a socio-political processes (Brosnan et al., 2018) loaded with implications and embedded patterns of exclusion and imbalance, others have demonstrated the politics of the relationship between law and scientific knowledge (Cole and Bertenthal, 2017). Rather than the interactions between law and science being a matter of transposing knowledge from one institution to the other, in order to foster rational decision-making, law and science can be seen as constantly shaping each other as institutions, anchoring their respective power over social relations while rendering less visible their individual politics, contradictions and limitations (Cloatre and Pickersgill, 2020; Jasanoff, 2006). In this process, the relative legitimacy of different forms of knowledge and sets of practices is

constantly renegotiated, with those deemed illegitimate pushed to the side of the legal system while others are more comfortably fitted (Cloatre and Pickersgill, 2020). In the analysis below, we explore an example of such exclusion through the metaphor of misdirection: a trick of disappearance by maintaining the gaze of the audience elsewhere, hiding politics as well as a process.

As explored by other articles in this issue, misdirections are in some ways magical. However, law and legal institutions more generally have a complicated relationship to reason and 'magic'. Legal scholars pointed out that the law is itself an institution rests on its own set of rituals (Goodrich, 1996). Exploring law's own languages and codes, often not far from incantations, or the spectacular and ritualistic nature of trials, critiques have insisted that the legal world is riddled with quasi-magical features (Barshack, 2000; Clark, 1930; Corcos, 2001). Indeed, and without denying its distinctive characteristics, approaching law as one form of ritualistic ordering alongside magic might be a more suitable way of thinking about its power to act, or to enchant, even those it fails to convince about its rationality. Insofar as the act of enchanting relies on 'dazzling' a spectator, in this reading, the rule of law does not necessarily derive from it being 'rational,' but in its ability to divert from features that may remind us of its more mystical foundations, and force our gaze on its 'reasonable' and 'predictable' nature: echoing Bruno Latour, the law has never been modern as much as it has worked to define itself as such (Latour, 2012). Law's magical features largely operate because modern legal practices are a "secularized way of performing certain material effects through symbolical acts; rituals that work in the imaginary but have unmistakable consequences in the 'real' world" (Alvarez-Nakagawa, 2017: 1250). The ritualised magic of law adopts a particular form in what some have termed the post-regulatory state (Collin, 2004; Fletcher et al., 2019; Fries, 2008). A feature of contemporary regulation is that the governance of conduct is no longer controlled exclusively by centralised state institutions. Instead, legislative functions have become fragmented and dispersed across multiple institutions and social actors. Rather than 'command and control'

directly the behaviour of the regulated, the state manages behaviours 'at a distance' by delegating some of its functions to institutions other than courts and parliaments (Black, 2002). The law is then not only found in legislative acts of parliament but instead, is dispersed in guidelines, codes of conduct, manuals, etc. This fragmented landscape of regulation, facilitates legal misdirections, a play of 'smoke curtains' and 'mirrors' where the law hides particular realities from view, away from the visible and spectacular theatre of politics, into more discreet and routinised spaces of legal decision-making that shape social experiences (Ball, 1975; Keenan, 2017; Rogers, 2008; Simpson, 1985). In our case studies, the law performs small tedious 'abracadabras' that dilute aspects of herbalists' knowledge under the pretext of managing and preventing risks associated with the practice of herbalism, albeit in different ways in each case study. This is the case for example when layers of bureaucracy create an illusion of substantive regulation and epistemic ordering. In doing so, the legal system misdirects our gaze away from the socio-political stakes of the ordering of healing, towards a tidy narrative of order linked to a set of rational procedures of risk management.

Alongside the misdirections embedded into the legal system, we explore the more visible forms of misdirections that herbalists perform in their efforts to act in ways compatible with the law. Using the malleability of the law, they stretch its boundaries when they consider it necessary to provide products, advice or care that they deem essential to their practice. In our reading, these become part of a broader attempt to be visible and recognised, to challenge the tacit exclusion performed by the legal system. We explore what it means for herbalists to sit at the edge of the law (in the case of France) or to see some of their practices hampered by increasingly complex regulatory demands (in England). This position creates everyday frictions between the possibility of practising herbalism on herbalists' own terms and remaining neatly within the boundaries of the law. The friction points also misfire into divergent trajectories that both enable, exclude and particularize different practices (Tsing, 2005: 6). The trickeries at play are facilitated by the state of regulation: in both contexts, the grey areas left

by regulations, and the exclusions they perform inevitably place much everyday practice on the edge of il/legality. In this way, illegality can be seen as constitutive of legal logics, an expected part of the project of making law. This part of our analysis builds on socio-legal engagement with legality and illegality, and in particular, on the tradition of legal consciousness: the everyday practices of law, particularly how its users diverge, adapt, challenge, or adopt law creatively, are studied as part of the law itself rather than as an excess that could be reduced by tinkering with the law. Law is seen as relational and therefore bi-directional, inevitably being changed by those who engage with it, while they also experience alterations as a result of their direct and indirect encounters with the law. The key analytic shift, where the emphasis is not on law but on legalities, is understood by Ewick and Silbey as a focus on "sources of authority, and cultural practices that are commonly recognized as legal, regardless of who employs them or for what ends" (Silbey and Ewick, 1998: 22). This dissolution of law with a big 'L' is altered by the exploration of law in society, including how different social actors ascribe different meanings to what they consider legal or illegal, how they experience, play and redraw those boundaries, and ultimately, rewrite them (Cowan, 2004; Halliday, 2019). When we speak about the misdirections of herbalists, we intend to move beyond simple dichotomies on what is legal or illegal, lawful and criminal, and instead, understand how the misdirections of herbalists co-create spaces of juridical tolerance. These misdirections are a form of tacit activism that sustain world-making projects (Fritsvold, 2009; Halliday and Morgan, 2013). Building onto the insights of socio-legal and anthropological studies on illegalities, we assume there are supplementary 'meanings' of licit/illicitness construed by social actors, where the crossing of legal boundaries matters more in social than normative ways. Negotiating with il/legality may be interpreted as a survival strategy (Peterson, 2014), or as an alternative lay interpretation of the law that supports a different kind of ethical project where the law is seen as having failed (Cloatre and Enright, 2017). The act of law-breaking can also be part of more explicit activist projects, drawing attention to

alternative lifestyles and alternative futures to those proposed by states and enabled by the law (Fritsvold, 2009).

In the following sections, we explain first the laws regulating herbalism in France and the main misdirections that we have identified. This is followed by a similar overview about herbalism in England, presented as a counterpoint to the French case. In each case study, we concentrate our analysis first on the misdirections herbalists perform to sustain their everyday practice and second, in the misdirections performed by the law through its regulatory bureaucracy and its disappearance of herbalism(s).

Herbalism and the law in France

In France, products that are considered 'medicinal, including medicinal plants and manufactured herbal medicines, can only be sold by pharmacists, and in pharmacies according to article Art. 4211-1,5, of the *Code de la Santé Publique*. Anyone else selling medicinal plants can be found guilty of the illegal practice of pharmacy, which is punishable under criminal law. Since the 1980s, herbalists have organised to contest this de facto monopoly, claiming that they too should have a legitimate role to play in the distribution of herbal medicines (Bost, 2015).

In response, and in the light of increasing demand from consumers, some exceptions to the pharmacists' monopoly have been created over the years, in particular for plants thought to be innocuous. A 2008 law liberalised 148 plants from the pharmacopoeia and made them available for general sale (Journal Official, 2008). These can be sold in places other than pharmacies – often health stores, or one of the few traditional *herboristeries* that still exist. But there are restrictions on how those plants can be sold. For example, plants cannot be mixed (with a few exceptions of specifically authorised mixtures) and should be sold in raw form (except for a few that can be sold as powders). Importantly, only pharmacists can advise on how those products should be used: despite this concession made to those who wanted to sell plants outside pharmacies, pharmacists continue to be the only actors recognised to have expert knowledge over medicinal

plants. Herbalists are allowed to sell innocuous medicinal plants, but only as can everyone else: the law gives them no additional right to advise or prepare. Effectively, their knowledge is not considered 'special' in any way, diluting their claims for recognition as legitimate experts of plants, as we return to.

But herbalism has not always been as constrained in France as it is today. Until 1941, certified herbalists occupied a legitimate (if fragile) place (Bost, 2018). After many years of pressure from the *Ordre des Pharmaciens*, the certificate was rescinded in 1941, which erased herbalists from any regulation relevant to healthcare practice. The fact that this took place under the Vichy government, though partly incidental as the reform was in the making for decades before, has come to sustain claims by herbalists that it should be seen as a historical anomaly that needs reversing. Consequently, from the early 1980s, a new generation of herbalists organised to try to have the certificate reinstated, with occasional support from politicians, but so far unsuccessfully (Cloatre et al., 2021). Today, herbalism is a coherent profession, unified in its effort to seek some recognition from the state, and to reclaim a more legal space.

Tricksters and boundary-crossers

Herbalists have learnt to work within the relative invisibility conferred by the law while stretching the boundaries of what they are allowed to do. How the law defines who should sell medicinal plants maps uneasily onto their actual availability, and the practice of herbalism. Despite apparently clear legal boundaries, the trade of medicinal plants in France is messy, and much of it happens outside of pharmacies. Plants sold on markets, in health stores or specialised herboristeries, constitute part of everyday healing for many users (Garreta, 2007; Brousse, 2018). Although many of these plants belong to the list of plants authorised for general sale, not all of them do. Similarly, even though only pharmacists are, in theory, allowed to advise on the medicinal uses of plants, others provide forms of guidance that isn't dissimilar. To some extent, this is because some herbalists respond to the constraints of law by playing tricks with the legal order, bending its borders in

response to their needs, or the demands of users. Yet, rather than being about deception, these tricks are a form of negotiation and adjustment to precarious conditions, inevitable trade-offs to sustain traditions that, they fear, would otherwise disappear, or minor diversions from the letter of the law to deploy other registers of care or safety. If herbalists are not fundamentally animated by a desire to trick the law (and indeed have been engaging with state authorities to renegotiate the law), they are also concerned that current regulations are unnecessarily restrictive and counterproductive, and that their strict application would result in a distorted and unworkable practice of herbalism.

Even where herbalists cross legal boundaries, they tend to do so with measure, remaining within the law, or arguably within the law, as far as possible. They are aware of the law, particularly when they have been provided with formal training, readily available since the 1980s (Ecole des Plantes de Paris, 2021; Ecoles Lyonnaise de Plantes Médicinales, 2021). The boundaries of legality continue to matter, but may be bent when it is required to keep herbalism possible and meaningful. Boundary-crossing is also usually discreet, keeping a façade of legality even when its substance is debatable, behind which less legal endeavours may also take place. For example, herbalists are guided by the law in terms of which plants can legally be sold outside pharmacies: yet, some feel that they need to occasionally venture beyond these restrictions when the list stops making sense.[1] They do so with caution, and discreetly, for example hiding some of those controversial plants in a dedicated cupboard only to be opened for trusted customers.[2] Authorised plants are displayed more prominently than the non-authorised ones, making it less likely that they might be noticed by anyone carrying the type of light touch checks that, in practice, often constitute the only way to be 'caught.' Or some might encourage patients to grow in their own garden plants that they are not allowed to sell, respecting the letter of the law while deploying a different understanding of the riskiness of plants (e.g. see the blog: D'Herboriste, 2019). Their motivation is rooted in the feeling that the law is poorly designed, creating a threat to herbalist practice

through its blind spots. They consider the list to be ill-adapted and inconsistent, leaving out many of the most commonly used plants in traditional herbalism, or featuring only the less useful parts of specific plants.[3]

Similarly, their everyday work is constrained by the limits to the sort of claims they can make over healing and the advice they can give, since providing a diagnostic or health advice could bring a claim that they are acting illegally by undertaking acts legally reserved for pharmacists or doctors. Yet, selling plants without guidance or advice is seen by herbalists as problematic, a blindspot of the law that may expose users to risks rather than protect them.[4] Again, many herbalists comply with this requirement. Others apply some flexibility, seeking to remain within a zone of tolerance while providing expert guidance. They may play with words to define such guidance so that it is not construed as 'medical/medicinal.'[5] Any guidance provided through labels is similarly cautiously phrased, avoiding medical claims or explicit posology.[6] Such crafting can blur the boundary between health advice of the type reserved for pharmacists and doctors, and a broader type of non-expert suggestions provided to customers, and the boundary of il/legality.

In all these techniques, the aim is to direct attention away from practices that signal any boundary crossing: language, writing, objects are adjusted and moved around to suggest that nothing of (legal) significance is worth noting. Those who tease the boundaries of the law try to avoid attention (of pharmacists who may report them, of law enforcement officials) by playing subtle visual and spatial trickeries, creating a sense of doubt about what is at stake. But herbalists are also not the only actors enabling this pushing of legal boundaries to take place. If we are to seek intentionality in this particular misdirection, deviations are fostered and facilitated by the make-up of the law itself: the absence of statutory regulation and the lack of legal existence of herbalists in France means that much of their practice takes place in less regulated spaces. It is easy for borderline activities to go unnoticed because performances tend to be to a limited and sympathetic audience. Yet, these activities are not invisible: state agents or professional associations occa-

sionally intervene, and stories of those who got caught and faced legal consequences travel far and fast. But such interventions are the exception to a more fluid everyday where rule-teasing is a secret hidden in plain sight: in that respect too, it resembles more a case of negotiation than of deception in ways that others have pointed out in their own analysis of il/legality (Cloatre and Enright, 2017; Cooper, 1996). For the most part, this negotiation does not prevent the broader infrastructure in which herbalism operates from holding up: in the day to day, most negotiations with the law and routine misdirections result in relatively peaceful and harmless coexistence between herbalists that monitor their own boundaries and legal agents that provide them with a zone of tolerance.

In this context, the stakes of the occasional boundary-crossing performed by some herbalists, and of this ongoing negotiation, can also be understood as part of a broader project of legitimation and resistance (Cooper, 1996; Fritsvold, 2009; Halliday and Morgan, 2013). Rather than being read as meaningless law-breaking, it is closer to a form of tacit activism, that seeks to expose and challenge the impact of the law on the ability for herbalism to survive (Cloatre and Enright, 2017). The ongoing efforts deployed by herbalists to renegotiate their position in law have been hampered by their ongoing precarity: attempts to be visible, and efforts to relaunch the profession, are made more difficult by the very strict limitations placed by the law on what they can do. In response, various individual and collective tactics have been put into place (Certeau, 2013). Stretching the boundaries of the law belongs to the former, with individual herbalists adopting different positions, some adhering to the strict boundaries of the law while others occasionally cross them, to sustain their ability to practice, and the future of their professions, and to remain visible and relevant. In that respect too, herbalists boundary-crossing is not mainly about breaking the law: rather they work through its blindspots, confident that their knowledge of plants means that they can safely circumvent the law while helping their patients/customers. They see patients as the main losers in a system that is so restrictive in terms of access to plants and

plant-based medicines that they are more likely to be tempted to purchase treatment in less safe spaces, such as the internet.[7] Their bending of legal requirements is a response to these limitations of the system, a way to overcome what they see as unfair and harmful effects of a misadjusted legal system.

Disappearing knowledges as regulatory misdirection

Alongside their occasional performance of minute legal misdirections, herbalists have developed more collective strategies to renegotiate the law, bringing its incoherence to the eyes of the state through official routes, from the lobbying of individual officials to contributions to public conversations. This has been supported by careful strategies to redefine the common ground of their profession, with schools of herbalism developing extensive training for those seeking to join the profession, formalising the kind of knowledge that contemporary herbalism rests upon (Cloatre et al., 2021). So far, these efforts have been thwarted by a different set of tricks played by the legal system itself. Rather than the tricks, illusion and invisibility at play being the work of an identifiable trickster, however, those have a more systemic origin, embedded in modes of action of the law itself.

Despite the best efforts of herbalists to be given a space in the law, they have so far met limited success. Some individual MPs have been receptive to their demands, raising their concerns in parliament through parliamentary questions or, more significantly, two dedicated Senate commissions. But herbalists struggle to see their knowledge recognised as a particular form of expertise, and the minor bending of the law by some herbalists coexists with a more structural process of disappearance, where the politics of law become hidden under a cloak of science. The legal system operates on a series of misdirections, turning attention away from some matters, to direct it towards its seeming intervention or its claims to action, and away from its politics and tacit exclusions through an emphasis on scientific resources. One of the most effective 'tricks' of the legal system is to divert away from the particular type of knowledge that herbalists claim to possess, and their users wish to rely on. Through rhetorical

and procedural manoeuvres, proposals by herbalists and users that a different kind of healthcare might exist, and that it might rest on a particular kind of expert knowledge, are discreetly effaced, disappearing behind the more forceful presence of scientific and biomedical demands.

This is in part because herbalists' knowledge is a challenge to regulators in France: regulators and the politically influential medical and pharmaceutical councils regard it as being popular rather than scientific knowledge. As a result, it continues to sit uneasily with the scientific expectations on which the regulation of medicines and healthcare professions is otherwise organised, and indeed the type of rationality on which modern law tends to rely. This tension, already ingrained in the laws that effectively consider herbalists as no more knowledgeable about medicinal plants than anyone else, has also hampered herbalists' efforts to be regulated otherwise: the boundaries of legitimate knowledge proposed by the law do not align with those followed by herbalists nor their customers. This disconnection has been striking whenever the question of herbalism has featured in parliamentary discussions. Since the 1980s, the (re)creation of a herbalist certificate has been occasionally raised through parliamentary questions. Each time, the response provided is the same – a cut and paste answer that brushes aside the possibility of a substantive discussion by rendering its problematique irrelevant: the certificate was rescinded in 1941, and medicinal plants are now sold only by pharmacists. In the eyes of the state, pharmacists have "complete knowledge of medicinal plants, in relation to their composition, pharmacological effects, and therapeutic uses" (Assemblée Nationale, 2020). This position negates the claims of herbalists or their supporters for a different kind of knowledge, focusing instead on the 'complete knowledge' that pharmacists possess. This was fleshed out further in the context of senatorial commissions, where (at the initiative of Senator Joël Labbé) the question of the diploma- and the future of herbalism in France- was explored in more detail. The commission proceeded with extensive interviews with a broad range of actors – including public agencies, Medical and Pharmaceutical Councils, industry, and schools of herbalisms –

juxtaposing the claims and positions of different interest groups, and illustrating the coexistence of different visions for medicinal plants. In these conversations, those who opposed the re-creation of a regulated profession for herbalists (notably representatives of the medical and pharmaceutical Councils)insisted that there was no need for such profession because pharmacists already fulfil that function. Pharmacists were the 'true' experts of medicinal plants, fulfilling any possible need for herbal medicine (e.g. French Senate, 2018). In these exchanges, like in the standard response Ministers have offered to parliamentary questions on herbalism, what becomes evident is that attention to the knowledge that pharmacists possess also renders invisible the alternative types of knowledge that herbalists want to see valued. Herbalists do not claim to know about plants in the same way as pharmacists do; their claims are underlined by a different kind of health politics, also made irrelevant by insisting on the ability of pharmacists to respond to all needs. These claims do not deny the value of science nor scientific knowledge, nor its lack of relevance to herbalism itself: indeed over the years, herbalists have made significant efforts to situate their own knowledge within scientific paradigms familiar to the legal system. Schools of herbalism reach out to science by introducing relevant teachings into curriculums, working with suppliers, manufacturers and producers who align with pharmaceutical regulations and learning from science where they see it as complementary to their practice (Bost, 2018). They seek to adhere to epistemologies that can make them more visible and more acceptable to the codes of the law. But they do so without entirely abandoning their attachment to the less explicable powers of nature or the roots of their practices in popular traditions: they consider those to also be relevant to how we relate to and engage with plants, and how we can preserve more fully their powers to heal, in their many dimensions. This includes a certain scepticism towards how plants are envisaged and transformed through pharmaceutical processes, and a wariness of the industrial logics that underpin pharmacological uses of plants. It is in this respect that their vision for a different kind of herbal healing is political, and lost in an emphasis

on the knowledge of pharmacists over plants as being 'complete.' This disappearance is effected by the legal system, not through direct confrontation, but through the repetition of what is seen as a straightforward, apolitical fact: expertise over plants is already supported by the law, and this expertise is all that patients may need. This is not to say that individual agents are seeking to deceive, or that they are themselves always actors rather than the audience in the legal misdirections at play: one of the strengths of legal misdirections is to rely on grander narratives and performances, within which everyday actions may individually be as expected, yet their association generate exclusion and fragility.

The effects of this disappearing act are read differently by herbalists and the legal system. For legal actors, it is a necessary step to protect patients from the dangers of plants. But by refusing to reach into the world of those who are seeking from herbalism something explicitly different from what pharmacists have to offer, and side-stepping suggestions that knowledge over plants may be multiple, the legal system also triggers some exclusions. Its denial of alterity leaves users dissatisfied with what pharmacists can provide needing to turn to less visible spaces on the edge of legality, where their only protection is the type of self-regulation herbalists have sought to develop. For herbalists, this is the most problematic side-effect of the regulatory system: although it ardently portrays itself as designed to protect vulnerable users, its apparent strictness distracts from its own limitation. Here, as in other areas of law, vulnerability is turned on its head: whereas the law's explicit aim is to protect, its ill-adjustment to everyday practice can result in fostering yet further risk and vulnerability, including by enabling zones of illegality (Munro and Scoular, 2012).

Herbalism in England: misdirections and routinised bureaucracy

In England, herbalists have benefited from a common-law exemption to make herbal medicines, which means that they are not exposed to criminal law in the way French herbalists are (MacLennan and Pendry, 2011). Because of this, England was seen by the French herbalists we met as a

more welcoming, as an idealised regulatory landscape.[8] The additional space given to herbal practice means that herbalists in England don't face the same threats of illegality, and the precarity they experience is of a different kind. They operate within a narrow space of practice allowed by a strictly defined legal exemption. This makes legal misdirections less striking, even more openly akin to a negotiation of boundaries. Areas of opaqueness proliferate along the margins between acceptable and less acceptable practices, which some herbalists feel the need to stretch to sustain what they see as meaningful practice. And for all its apparent efforts to recognise the kind of social demands that herbalism addresses, and put in place a detailed apparatus to protect those who choose to rely on it, it is not clear that the regulatory system has been willing to engage with herbalists knowledge, or their claims for difference, much more than the French system has.

Today, under the herbalists' exemption, subject to certain conditions, anyone can prepare, give, and sell herbal medicines (based on single or multiple herbal substances or preparations) in the context of a one-to-one consultation.[9] Some limitations apply: the herbal product should not be manufactured or assembled by a third party; the supply of the herbal remedy ought to be done in the same premise where it was assembled, and if using restricted herbs (for example, aconite, chinchona bark, ephedra), those must be kept safely away from the public (Medicines and Healthcare Regulatory Agency, 2014). Importantly, what herbalists can do can also legally be done by anyone else, because the herbalist title is not protected by law (Banerjee, 2009; Clarke et al., 2004).

The restrictions under which herbalists in England need to operate foster their own type of boundary-work that stretches the law in discreet ways, bending the borders of legality while appearing to be in full compliance. This is illustrative of the kind of negotiation fostered by lay engagements with the law. For example, changes to the legislation in 2012 brought by EU rules prevented herbalists from acquiring bespoke preparations ordered from third parties, causing practical difficulties to herbalists who had been relying on such supplies (McIntyre, 2011; Santosh,

2015) before the gradual shift away from common law.[10] One herbalist we interviewed recalled researching the wording of the law, trying to figure out a way to stretch the boundaries of the meaning of 'manufactured' herbal products:

> For a while you see under the 1968 Medicine's Act, I was trying to find a way that we could continue to legally practice. And there was a part in the Medicine's Act where I think trawling through the Medicine's Act sort of midnight one night and I came across the words about assembly and the words assembly were in that Act which said, as long as the product is assembled on the premises. And I thought, well I wonder what the actual legal term 'assembly' really means. I sort of trawled down, trawled down and sifted through the whole thing until my eyes were popping out and found that 'assembly' according to that definition meant putting a label on it, which seems ridiculous, but that is what it came down to. So I thought, well if we can get our external herbal suppliers to make up the prescription and send it back to us, we stick the label on and give it to the patient. We are still working within the law because the final assembly is taking place on our premises [...].[11]

Although she did not actualize this potential misdirection, this shows how herbalists can construe their practice through the finer components of legislation, looking for ways to expand definitions to make essential elements of their practice sustainable. Law is also produced and transformed through this craft: the letter of the law might be the purview of judges and regulators, but social actors find alternative meanings and construct legality out of continuous evolution in their relationship with the law (or in the absence of it) (Halliday, 2019; Hertogh, 2004). Such interpretations can go untested and unchallenged until the more exceptional intervention of formal legal actors, but in the everyday of the law, such interventions are not the norm. Another participant talked about how her health store offers light-touch 'consultations' at the till, rather than in the private settings that the law requires.[12] This practice has been found in local studies in London too among Chinese herbalists (Teng et al., 2015). This was a way for her to work around restrictions to continue selling mixed herbal remedies, a key aspect of her practice. When explaining such

negotiations, herbalists were conscious that they are somehow stretching the rules. Yet, like their French counterparts, they are also keen to try to avoid direct confrontations with legal institutions, looking for ways to make the requirements of the law workable for their everyday practice, and when this is not possible retaining as much of the spirit of the law in their adjustments as they can. Like in France, these minor misdirections are enabled by the regulatory system, and its fostering of zones of tolerance: most infringements carry little sanctions, and legal cases against herbalists have been rare. Rather than acts of law-breaking, the stretching of legal boundaries is a performance in which actors and audience play their part, as long as a degree of care and measure remains applied.

Disappearing knowledges as regulatory misdirection

In very much the same way as their French counterparts, herbalists in England strive to show the relevance and particularity of their knowledge and to demonstrate it apprehends some aspects of healing differently from biomedical professions. If they accept that there are some overlaps in how different constituencies may know about plants and their healing power, they also revendicate a unique contribution and advocate for the survival of these modalities of healing. Yet, the regulatory system disappears herbalists knowledge as expertise, in ways that are more nuanced but not dissimilar to the French context.

In the last twenty years, herbalists' attempts to become a profession regulated by statute have failed. To some extent, their goal got caught into a broader deregulation agenda pursued by the British state, aimed at limiting statutory instruments because they were considered expensive, bureaucratic and ineffective (Allsop and Jones, 2018; Hampton, 2005). But by applying this logic to herbalism, the state performed a misdirection of its own: it evaded and postponed any serious engagement with claims of expertise by those who use plants as medicines. Legislators and other stakeholders in the regulatory debate have drawn attention to herbalisms' absence of a scientific basis or that those who make herbal medicines don't have a standardised and homogenous body of knowledge that transcends cultural differences

between healing traditions. The lack of homogeneity among those who use medicinal plants continues to sit uneasily with the universalist scientific expectations on which the regulation of medicines and healthcare professions is otherwise organised, and indeed the type of rationality on which modern law tends to rely. For example, the 2001 House of Lords Science and Technology Committee report segmented professions into legalisable and non-legalisable professions (Banerjee, 2009; House of Lords Select Committee on Science and Technology, 2000). Here, likeness to science- its ontological, epistemological and operative standards- became a way to discreetly sideline claims by non-European medical traditions. Western herbalism was considered more legalisable because of its closeness to scientific language and epistemological basis (Cant, 2020). By contrast, practitioners of Ayurveda and Traditional Chinese Medicine were deemed non-legalisable professions, and even described as potentially 'dangerous,' because their knowledge was more akin to philosophy or religion. In the end, any hopes herbalists may have had for statutory regulation had to be abandoned.

It could be argued that herbalists' scientific character has been shaped by their exclusion from the healthcare system. Critics have long redirected attention towards the 'unscientific' character of herbalist practices to justify its regulation or prohibition. And in response, herbalists have tried to become more like doctors or like pharmacists: they have set up associations that set standards of conduct, they have incorporated scientific norms and practices in their education and training and they have promoted the integration of research about the therapeutic effectiveness of plants. Some of these associations have lobbied successive governments over the last hundred years to have their title protected. Protection of title serves two key objectives: it prevents non-experts from practising and unsafe practitioners can be banned from a register. Yet, herbalists have nevertheless failed in their attempts to convince parliament of the need to protect their title. This might seem surprising, considering herbalists have been somewhat tolerated and they have had allies in parliament who have been sympathetic to their plight. However, tolerance has not been born

completely out of trust in herbalism *per se*. Many times, it has been defended on other terms: for example, parliamentarians and other government institutions have defended herbalism on the basis of the freedom of choice of consumers and legislators own conception of Britain as a liberal country (e.g. House of Commons, 1985).

Despite herbalists attempts to have their profession protected by law, they have also rejected offers where their identity is at risk of being erased by becoming assimilated or subordinated to the medical profession. When Aneurin Bevan offered herbalists to join the National Healthcare System in 1948, herbalists rejected it because they would have had to fall under the oversight of doctors (MacLennan and Pendry, 2011). Today, herbalists and traditional healers using medicinal plants also have a plurality of voices and positions concerning such regulation. Most associations have been enthusiastic about regulation and embraced transformation into a more 'scientific' practice aligned with the law, and one that promotes the use of over-the-counter traditional herbal products when properly regulated. However, some factions have been more ambivalent about the benefits of becoming regulated by law, and have actively resisted the 'scientization' of herbalism because such a change would disappear the very knowledge and practices they have embodied (e.g. see the blog: Herbarium, 2009). Those involved in these networks prefer to stand at the edge of the law and sometimes stretch some of its rules. One of the herbalists even parodied the scientific identity she encountered in her university education by wearing laboratory coats and acting out at the same time 'witch-like' behaviours.[13] This re-appropriation of the exclusion is also a resistance to the pull to become subjected by the symbols of scientific authority (Loizidou, 2007). That same herbalist also used the symbol of magic as a way of reembracing the otherness of herbalism and deflecting criticism from what is understood as a scientific standpoint:

> When we first qualified and we first went out onto the market stall, we were met with a lot of people kind of saying, can you prove that it works? How do we know? We responded by bringing scientific research, our papers and they just even when you

have got all of that, they still want to push and go, how do you know it works? What is it? And then, one day, I don't exactly know how it came about, but we made witch's costumes and we put black pointy hats on and we had a cauldron and then nobody ever asked us if it works anymore. All those people were just kept away.[14]

Regardless of herbalists' chosen response, the regulatory system has two limitations: the first is the implication that herbalists knowledge needs transforming, along epistemological lines that do not necessarily sit well with some of their beliefs. In this process, claims to be 'otherwise' are discreetly silenced in favour of a conditional acceptance, that depends on embracing more scientific paradigms (Dixon, 2014; McIntyre, 2011). The second is that, even if herbalists are to embrace new regulatory demands, unless their title is protected anyone could claim to be a herbalist regardless of their own credentials. Herbalist knowledge remains at best tolerated but is not seen as sufficiently palpable to be protected as expertise. Yet, the complex bureaucratic apparatus that was created as an alternative to statutory regulation makes such tacit exclusion, and lack of protection, hardly visible. This is arguably the most striking type of misdirection undertaken by the regulatory system, and one that may be most common to contemporary societies: bureaucratic routines are deployed as a way to diffuse and disappear more complex socio-political claims, and epistemological debates.

Bureaucracy and the deflection of debate

While herbalists had sought to be offered the legitimacy and protection conferred by professional statutory regulation, the British government provided a rather different response. In 2011, the government announced that it would create a register of practitioners using unlicensed herbal medicines, to be overseen by the Health and Care Professions Council (HCPC) (Barber, 2014). Herbalists and traditional healers thought they had finally succeeded in their efforts for state recognition as a scientific discipline. As one of our interviewees noted, the HCPC was "the natural home for herbal medicine, because it is setting standards. It is about making sure that people can't practice if they are struck off."[15] However, this deci-

sion was overturned in 2014. Instead, herbalists were brought under the oversight of the accredited register program of the Professional Standards Authority (PSA) (Wadell, 2019; Walker, 2015), triggering a rather different, and more bureaucratic approach.

Set up in 2002, the PSA is an independent meta-regulator that 'regulates the regulators.' Meta-regulators imply re-casting the function of law from direct control to proceduralisation (Scott 2004; Aust and Gozlan, 2010). For example, in the case of the PSA, one of its functions is to oversee the processes for dealing with complaints and standards used by all health professions, including doctors, nurses midwives, etc., without directly engaging with the professions themselves (Allsop and Jones, 2018). Instead, it oversees the procedural systems that other regulators have put in place.[16] This oversight by a dedicated agency enables the state to scale back traditional legal mechanisms, relying instead on less direct means of shaping professional behaviours through standards, guidelines, codes of conduct, education, etc. Self-regulating bodies- such as those created by the accredited registers scheme - have to follow a set of standards and processes to identify risks posed by registrants and mechanisms to mitigate them (PSA, 2015, 2018). If they fail to uphold such standards, the self-regulating bodies themselves will lose their accreditation, and, it is implied, their legitimacy. While the goal is to improve standards of practice, the day-to-day working has produced something rather different, where regulatory choreographies become an end in and of themselves. For some of the herbalists we interviewed and their associations, the focus on procedural actions risked missing out on substantive controls needed to protect end-users from unqualified healers, producing an illusion of regulation rather than any meaningful oversight. This approach to regulation assumes that the risks of unregulated professions are manageable through bureaucratic control focused on policing behavioural norms to manage the indeterminacy in healing relationships (Doyal, 1990; Gjengedal et al., 2013). But it does not engage with the substance or knowledges shaping the practices at stake, leaving aside the more difficult questions raised by herbalists' demand for statutory regula-

tion, since the knowledge(s) on which they rely is not relevant to the exercise. In its practice, this form of regulation may have made complementary medicines visible and knowable, and thus, "amenable to measurement, verification and validation," (Wahlberg, 2015: 13) but it does little to engage their epistemological claims, nor to offer direct protection to practitioners or users.

This subtle misdirection sidelines politically thorny questions about herbal medicine's efficacy and knowledge-base and redirects attention to the governance of standards, guidelines and other processes. On one hand, what unfolds is a more insidious and fragmented system of regulation that fails to engage with herbalism and other traditional healing knowledges on their own terms. Herbalists are not swooned by the charm. Most herbalist associations rejected this option, voicing their opposition to a system they deemed to be a mere regulatory illusion or a duplicate of what they were already doing (Dissenting Members of Herbal Practitioner and Medicines Working Group, 2015). It remains self-regulation without any ability to punish intruders and those who they deem potentially dangerous practitioners because the state has not protected their title. They regard it as regulation without any teeth, lacking any ability to correct risks associated with the use of plants, and side-stepping the main argument in favour of regulation: protecting the specialist knowledge required to mix and use plants correctly. At the same time, leaders of herbalist associations interviewed worry that embracing the PSA model would mislead people into believing that there is effective regulation.[17] Today, two decades after the parliamentary inquiry that opened the door to the process towards statutory self-regulation, herbalists suffer from legislative fatigue and have a hard time believing in the magic of the law. They have not only figured out that the apparatus of professional governance is a magic trick, meant to create the illusion of accountability and enforcement of the rule of law, but they've also realized the magician is a trickster, a figure with no real power other than from those who believe in it and its rituals. Instead, they prefer to continue to practice away from its performance.

Conclusion

Overall, both in France and England the interface between law and herbalism is riddled with misdirections: both regulators and herbalists foster a situation in which an illusion of cohabitation between legal logics and herbalist practice is provided. Yet, such cohabitation is resting on efforts to make others look elsewhere: herbalists negotiate their precarious activities between more or less visible registers, playing on the ambivalence of the law where they feel this is needed or justified. Regulators, willingly or not, disappear the particularities of herbalist knowledge and their users' demands, denying some of their more political claims for epistemological alterity. In these debates as elsewhere, scientific knowledge and rationality deflect attention from other calls and voices. Herbalists, and patients who seek their advice and resources, are voicing dissatisfaction with what is available elsewhere, and indeed with biomedicine. Those who reaffirm the adequacy of existing regulation through a reminder of the range of biomedical resources available, or propose ways for herbalists to be more like (biomedical) health professionals, are drowning rather than engaging those dissident voices.

An effect of this situation, that herbalists most critical of the law we met decried, is to foster precarity and vulnerability, of herbalists as well as of patients. This in itself could be read as a form of misdirection, though unintended, inscribed in the logic of illegality itself: as claims and lifestyles are left out of legal debates, and pushed to the fringes of legality, they are displaced into less visible and less protective spaces. For herbalists, the biggest failure of the system is that no legal barriers are placed to prevent healers they consider less qualified, or less scrupulous, from practising. In pointing to this blindspot, they denounce some of the misdirections produced by law, hiding away the very possibility of ill-intended tricking that it fosters. The law claims to protect through restriction, criminalisation or selective legitimation, insisting on its completeness and the value of its rituals. Yet it leaves in its blindspots those whose world-making projects are deemed irrelevant or incompatible, relegating them to less legal or unregulated, and less protected, spaces. As the fragile status quo remains, herbalists and

legal agents continue to perform everyday misdirections that, though multiple in their forms and mechanisms, open up questions about the nature of both herbalism and law. Each one plays into the game where both play expected roles, but in everyday life, some fall short of that 'ideal' and others take their role too seriously, to the point they believe their performances are real. Or one may say, with time, they become 'real' as reinterpretations and adaptations between herbalists and regulators become sedimented through practice (Butler, 1988; Callon, 2010). In the negotiations between herbalists and the law, broader questions of national politics also shape the kind of performances at play. In France, the background is in part about institutional tensions: changes to the rights of herbalists also touch on the sensitive question of where the exclusive rights of pharmacists and doctors extend, and where the monopoly of pharmacy over borderline products may be eroded. At the same time, the apparent attachment of the state to narratives of science, and of protecting through science and law, echoes broader expressions of Republican values. In England, bureaucratic rituals are part of a broader turn towards decentralised governance, where substantive decision-making can become dissolved in more mundane techniques of surveillance.

The performative coexistence of law and herbalism clashes with the portrayal of law as a pillar of rationality. Despite its continued reliance on scientific institutions as norm-productive, and on bureaucratic procedures as productive of a particular form of protection, ongoing negotiations expose the limits of law's grander narrative as rational, predictable and transparent. A key feature of law's magic is its ability to create fictions of separation and indivisibility where there is entanglement, yet everyday frictions expose some of the tricks at play. Insofar as the purification process is prone to fail or misfire (Callon, 2010; Latour, 2012), an everyday legal misdirection disrupts the gaze away from key political demands, while creating the illusion of 'action.' Driven by consumer desires, global herbal medicine markets thrive (Banerjee, 2004; Barnes et al., 2007; Kudlu and Nichter, 2019) and states are pressured to establish accountability mechanisms without willingly sanctioning herbalists knowledge. These tensions map onto

narratives of the disenchantment with modernity, including how law participates and is one of its main adherents. The disenchantment operated by the law seeks to purify practices from the irrational, but in doing so fails to acknowledge the cohabitation of modern law with other ways of being. Weeding the magic out of herbalism, relocating it carefully into the remit of science, is an easier way for the law to tame it as an object and make it manageable. In turn, resistance to regulation is in a way a form of rebellion directed against the disenchantment of the plant world. Legal discourses take part in the stories of disenchantment characterised by the use of rationality as a replacement of magic, and predictability as a replacement of wonder (Bennett, 2001).

Acknowledgements

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Notes

1   Interviewee Fr.3 25/02/2018; Interviewee Fr.4 25/02/2018; Interviewee 1 06/04/2017.

2   Interviewee Fr.6, 10/04/2018.

3   Interviewee Fr.9 06/09/2018.

4   Interviewee Fr.8 06/09/2018; Interviewee 2 Fr. 06/04/2017.

5   Interviewee Fr.7 12/08/2018.

6   Interviewee Fr. 4 25/02/2018.

7   Interviewee Fr.6 10/04/2018; Interviewee Fr.8 06/09/2018.

8   Interviewee En. 5 05/07/2018.

9   Human Medicines Regulations 2012, Regulation 3 (6) and (9).

10   Interviewee En.2 29/05/2018; Interviewee En.3 05/06/2018; Interviewee En. 8 12/11/2018.

11   Interviewee En.8 12/11/2018.

12   Interviewee En.5 05/07/2018.

13   Interviewee En. 6 12/07/2018.

14   Interviewee En. 6 12.07.2018.

15   Interviewee En. 9 16/11/2018.

16   Interviewee En. 1 27/04/2018.

17   Interviewee En. 2 29/05/2018; Interviewee En. 8 12/11/2018; Interviewee En. 16/11/2018.

Following Misdirection and Multiple Malarias in Santo Domingo, Dominican Republic

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Abstract

Misdirection can be understood as a social process of pursuing certain kinds of evidence while drawing attention away from others. This paper explores misdirection in the context of malaria elimination in the Dominican Republic. Malaria has recently exploded in impoverished spaces of the capital, Santo Domingo. Using ethnographic material collected from 2018-19, three perspectives trace the social co-production of misdirection. First, a young man afflicted with fever and weakness understands his ailment as "stress sickness" brought on by poverty and structural violence. Second, clinicians focus on the results of hemograms to diagnose febrile patients, creating a pattern of misdiagnosis. Lastly, malaria policies and financing demand more indicator data, creating the appearance of a neutral reality separate from local histories and political tensions. In the end, misdirection obscures malaria's multiplicity, or the alternative realities that arise among the social actors who live with and respond to the problem of malaria in the capital. Attention to social-material practices breaks out of the narrow conceptualization of malaria as only a parasitic disease and reveals its other, multiple manifestations that require more than techno-biomedical solutions alone.

Keywords: Malaria multiple, misdirection, elimination, ethnography, Dominican Republic, Hispaniola

Introduction

Malaria on the rise in Dominican Republic

In September, 2018, an article appeared in a popular Santo Domingo newspaper, noting that:

> The malaria outbreak affecting residents in *barrios* of Santo Domingo-West was not a surprise to community members, whose leaders have, for a long time, been warning about and demanding definitive solutions for the small ravines that surround them, but their voices went unheard amidst the water-logged streets and thick brush that encircle their homes (Pantaleón, 2018: author's trans.).

Ultimately, more cases were reported that month (87 cases) than any other in the year, as malaria surged in a part of the city nicknamed *La Ciénaga*, or "the swamp." *El nombre se lo dice* one resident said—"the name says it all."

The Dominican Republic and Haiti share the last malaria-endemic island in the Caribbean, the site of Europe's first landfall in an imagined New World and where shipments of enslaved human cargo brought along malaria parasites (Rodrigues et al., 2018). All local cases on the island are due to *Plasmodium falciparum* parasites, which remain chloroquine-sensitive and are transmitted by

Anopheles albimanus mosquitos. In 2006, the International Task Force for Disease Eradication declared elimination "technically feasible, medically desirable, and economically beneficial" in both countries on the island (WHO, 2007: 28).

At the time of the Task Force meeting, malaria in the Dominican Republic was a mostly rural disease. Bilateral cooperation with Haiti and improvements in surveillance, medical management, and vector-control had substantially reduced disease burden (Roberts, 2010). In late 2012, both countries agreed to work towards complete malaria elimination on the island by the year 2020 with support from the Global Fund for AIDS, Tuberculosis and Malaria (GFATM) (WHO, 2013). By 2013, that goal seemed tantalizingly close in the Dominican Republic: that year, malaria incidence had never been lower, both nationally (579 total cases) and in the capital region (40 total cases), than at any point in the previous 20 years.

But in late 2014, cases began sky-rocketing in Santo Domingo. By 2018, nearly 80% of all cases nationwide were in the capital. The outbreaks were not confined to one part of the city but shifted across different municipalities, where entrenched poverty, poor surface water drainage, and a weak health system were the norm. To note, virtually all cases in these outbreaks have been autochthonous, rather than imported from Haiti, where malaria is far more prevalent.

Similar to other areas of Santo Domingo, malaria was already present in La Ciénaga before this outbreak, but in low numbers. As the population grew, so too did cases. Poor people from outlying provinces had come, in their words, to *buscar su peso*, find any work they could. In La Ciénaga, they settled on land once declared *inhospitable*, or uninhabitable, given poor drainage that led to frequent flooding (Figure 1). Once vacant, state-owned land, parcels in La Ciénaga were now sold to these new arrivals as patronage gifts in exchange for votes, since the crowded masses of La Ciénaga symbolized a larger voting bloc.

Concurrent to rapid urbanization and the unexpected rise of malaria in the capital, the country's health system began to decentralize the national malaria program to local-level health districts. Long a vertical, stand-alone program within the Ministry of Health, the national malaria program was instructed to transfer its technical competencies for all aspects of malaria control and elimination—from clinical management to outbreak response—to local districts and healthcare centres, where staff were less familiar with the disease and where resources were limited. From then on, the national program assumed an advisory role. These changes were consistent with the wave of structural reforms that have swept over Latin American health systems since the 1970s in order to cut costs and meet demands of

Figure 1. Flooded home in La Ciénaga. Photo by Hunter Keys, 2018.

international funders (Bossert et al., 2000; Mitchell and Bossert, 2010).

The decision to decentralize the malaria program may have also been influenced by recent developments in malaria financing on the island. Prior to decentralization, the country received over $7 million USD in malaria funding from the Global Fund. As time went by, the Dominican Republic found itself in the paradoxical position of being 'too rich' to qualify for continued Global Fund support to fight malaria. Global Fund money was instead disbursed through performance-based mechanisms, among them Cash on Delivery (CoD), which required countries to meet specific targets in reducing autochthonous cases before receiving funds (Herrera et al., 2015). The CoD funding system posed a dilemma when, for example, outbreaks of malaria effectively disqualified the Ministry of Health from receiving financial support to respond. This is not the first time that the country has faced a rise in malaria concurrent with a decline in funding: after years of DDT spraying and investing in rural sanitation programs, the country came close to complete elimination by 1968, reporting only 21 cases that year (Boncy et al., 2015). The gains were short-lived: by the early 1980s, malaria once again resurged across the country due to declines in public spending and re-seeding of transmission by an infected Haitian migrant workforce (PAHO, 1983), which the Dominican government had contracted to harvest sugar cane under deplorable conditions (Martinez, 1999).

Thus, as malaria outbreaks grew in the capital in the early 2010s, the institutional landscape became marked by changes in the health system, the influence of international organizations such as the Global Fund, and complex public-private financing schemes. In the months leading up to this study, malaria funders unrolled a new financial plan. In early 2018, the Regional Malaria Elimination Initiative (RMEI), a multi-million-dollar, five-year project kicked off across seven countries in Central America, Mexico, Colombia, and the Dominican Republic. Financing for RMEI flowed from national governments and a mix of loans and grants from the Inter-American Development Bank, Bill and Melinda Gates Foundation, Global Fund, and Carlos Slim Foundation. In effect, years

of declining public spending for the Dominican health system and the intractable nature of malaria had created an opportunity for 'philanthro-capitalism,' or the use of performance-based financing to solve health problems in countries with a hollowed-out public sector (Erikson, 2015). By late 2018, representatives from well-known international health and development organizations were busy in Santo Domingo planning a new community engagement project for malaria in the capital.

Malaria multiple and misdirection

It was against this backdrop that my ethnographic work on malaria took place. I asked simply how people understood the illness, how they were dealing with it, and what should be done about it. This included not only those who traditionally fall under the gaze of medical anthropology—the 'local community'—but also the field-level staff, program planners, and executive leadership. I 'studied up' the scale of social and scientific power by interviewing and observing experts, visiting consultants and others who do not actually live in poor places where there is malaria but who still pursue the disease with a "relentless ethos of optimism" (Brown, 2017: 483). The personal and professional lives of these social actors intersected because of malaria, but how did they understand it, learn to live with it, or try to eliminate it?

But I also sought to go further. Rather than 'see' malaria as a disease (a passive, isolatable object), why not consider the practices that handle it (Mol, 2002)? This approach considers the social-material practices that delineate, manipulate, and represent malaria. Malaria does not wait patiently 'out there' to be diagnosed (or eliminated); there are 'multiple malarias' that emerge from the myriad ways in which people, technologies, and the non-human world interact (Chandler and Beisel, 2017). By foregrounding malaria *practices* rather than malaria the *disease*, we come to appreciate how malaria multiplies (Mol, 2002).

Just consider, for example, the difference in 'seeing' malaria as an ordinary part of everyday life—as many people do in many poor parts of the world—*and* as the singular focus of powerful global health philanthropies. Or at an interpersonal scale, how diagnostic decision-making,

patient preferences, and availability of material resources come together to enact a particular 'kind' of malaria. For example, the process of diagnosing malaria in under-resourced settings can depend less on the detection of malaria parasites (one definition of the disease) and more on a negotiation between patient and clinician (a different kind of understanding altogether) (Beisel et al., 2016; Umlauf, 2017; Chandler et al., 2012). These realities contrast with presumptions of globally-accepted medical guidelines, which declare that malaria diagnosis depends solely on the presence of malaria parasites detected by rapid diagnostic test (RDT) or microscopy (WHO, 2021). On the one hand, we appreciate malaria as a parasitic disease that becomes real through blood samples and laboratory technology; on the other, we find that it is a social process in which clinicians and patients make do with what is available and respond to different pressures and preferences. In this way, malaria multiplies through acts of coordination among clinicians and patients, laboratories and medical supplies, criteria and data, and bureaucracies and organizations (Berg, 1997; Mol, 2002; Engel et al., 2017). Malaria becomes something different to different people. Attention to practices reveals malaria's multiplicity and breaks out of the narrow framing of malaria as only a biomedical disease.

Here, I link the idea of malaria multiple to the concept of *misdirection* to show how an adherence to the biomedical paradigm, which works hand-in-glove with malaria financing schemes, obscures malaria's multiplicity. In magic, misdirection refers to the magician's sleight-of-hand to draw attention towards an intended outcome and away from the technique used to achieve it (Kuhn, 2019). In this instance, misdirection is intentional. In the domain of global health, however, misdirection can be less obvious and more difficult to pin down. Responsibility for misdirection is distributed across individuals, institutions, bureaucracies, research practices, and histories. It can be embedded in epistemic traditions that allow for global health policies and systems to 'work.'

One of the best examples of misdirection in malaria practices is the trend of biomedical technologies coming to be seen as *the* solution to the problem of malaria. RDTs, anti-malarial combination drug therapies, fumigation, and insecti-cide-treated bed nets remain the cornerstone of global malaria control and elimination strategies, and they have certainly reduced morbidity and mortality (O'Meara et al., 2010). However, the appearance of unanimous support among malaria experts and funding institutions for these techno-biomedical solutions creates the impression that such technologies are "consensual, universally applicable, technically feasible, and morally desirable—in short, irresistible" (Eckl, 2017: 424). A study of the social lives of global malaria policies reveals how internal conflicts among experts about the problem of malaria, its techno-solutions, and who provides those solutions are ultimately downplayed in order to preserve political power (Eckl, 2017).

That power is usually tied to the ability to secure more funding from a core group of donors promoting corporate-based, managerial approaches to measure malaria program success (Tichenor, 2017). In this way, misdirection draws attention away from malaria's socio-political determinants, such as rising inequalities, land-use patterns, and access to healthcare (Brown, 1997; Packard, 2007) and towards indicators and 'performance metrics,' de-contextualized evidence that further reinforces the idea of universally-applicable solutions (Peeters Grietens et al., 2019). In effect, technologies become even more appealing for governments and vested interests since they make malaria appear to be a solvable, depoliticized problem rather than one that requires change to the status quo (Kamat, 2013; Packard and Brown, 1997).

Building on this literature in medical anthropology and science and technology studies (STS), I continue the argument that contemporary social-material practices for malaria create the illusion of certainty, validity, data quality, and so forth. This suite of scientific practices comprises the bedrock of the malaria elimination paradigm in Haiti and Dominican Republic (Boncy et al., 2015), a geographic region that has largely escaped the analytical lens of misdirection and malaria multiple. Rather than accept this paradigm as 'right,' I draw on the ideas of misdirection and malaria multiple to reveal what it misses. Fidelity to standardized scientific practices directs attention towards one, commonly accepted

construction of malaria as a parasitic disease and away from other co-constructions of malaria.

To illustrate this, I follow the social practices involved at three crucial stages: from the onset of illness and its interpretation; to the moment of diagnosis; and finally, to the collection of metric data to support malaria programs and financing. While previous literature richly describes the relationship between malaria's illness experience and structural vulnerability (for example, see Muela Ribera and Hausmann-Muela, 2011); the ambiguity of a clear diagnosis (Hausmann-Muela et al., 1998; Umlauf, 2017); the allure of simple technologies for diagnosis (Beisel et al., 2016); the disconnect between standardized treatment guidelines and local realities (Chandler et al., 2008; Chandler et al., 2012); the problematic collection of indicator data (Gerrets, 2015; Kingori and Gerrets, 2016; Tichenor, 2017); the role of indicator data in 'global health business' (Erikson, 2012); and the framing of the malaria problem within expert cultures (Brown, 1997; Eckl, 2017; Eckl, 2014; Packard, 2007), few studies have sought to explicitly connect these strands together in the same context using the concepts of misdirection (Peeters Grietens et al., 2019) and malaria multiple (Chandler and Beisel, 2017). The nexus of misdirection and malaria multiple constitutes a new contribution to social studies of malaria and the STS community more broadly.

Following these two theoretical strands led me into conflicted spaces, where, for example, a malaria diagnosis led to two, seemingly opposite conclusions about the nature of the illness; where an unreliable blood test functioned as a sort of divining rod amidst uncertainty; and where an audit culture, touted by experts as "what should be," left little room to consider "what really is." These findings expose "the gap between assumed clarity and actual ambiguity" (Eckl, 2017: 424).

The goal of this paper is not to heap criticism on the social actors struggling against malaria in Santo Domingo. If *mis*direction diverts attention away from social-political complexities to create the illusion of only one 'kind' of malaria (a 'natural' biomedical disease to be eliminated), then its alternative—a reimagined *direction* for the elimination paradigm—is one flexible enough for malaria's multiple realities. Why is this necessary?

Because, as I explore below, malaria is not the same thing, nor highest priority, for everyone involved; the stakes are different. A reimagined direction for elimination on the island should certainly keep trying to find and cure the sick and prevent malaria's reintroduction, but it should also go further by asking whether the practices involved in that process are good for the people (Mol, 2002).

Methodology and context

This work draws from multiple ethnographic site visits to Santo Domingo that began in early October, 2018 and continue at the time of this writing. The accounts below draw on data collected from October, 2018 – March, 2019. During this time period, total time spent 'in the field' was approximately six months.

Data collection was based on semi-structured interviews, personal observations and field notes, and shadowing key informants in their daily lives. Key informants included malaria patients, clinicians in public hospitals and clinics, residents and community health volunteers in La Ciénaga, field-level staff employed in the malaria program and public health system, and epidemiologists, malaria experts, and visiting consultants from external agencies. A total of 49 key informants were interviewed.

From 2010-2020, the highest weekly caseload in La Ciénaga occurred in week 39 of 2018 (n=28 cases; Figure 2). This ethnographic study began the following week. By then, cumulative incidence from week 1-40 of 2018 was 6 per 10,000 people, double the incidence over the same time period in 2016 and 2017. One death was reported in 2018 and three deaths in 2019.

In 2020, the total population size of the La Ciénaga focus was estimated to be around 430,000 people. Given their economic circumstances, most residents of La Ciénaga sought care at publicly-subsidized hospitals and clinics or were diagnosed and treated through active surveillance (home visits) by public health system field staff. For ease and clarity, the term 'malaria program' encompasses all planning, coordination, and field activities implemented by the central agency undergoing decentralization, and 'district
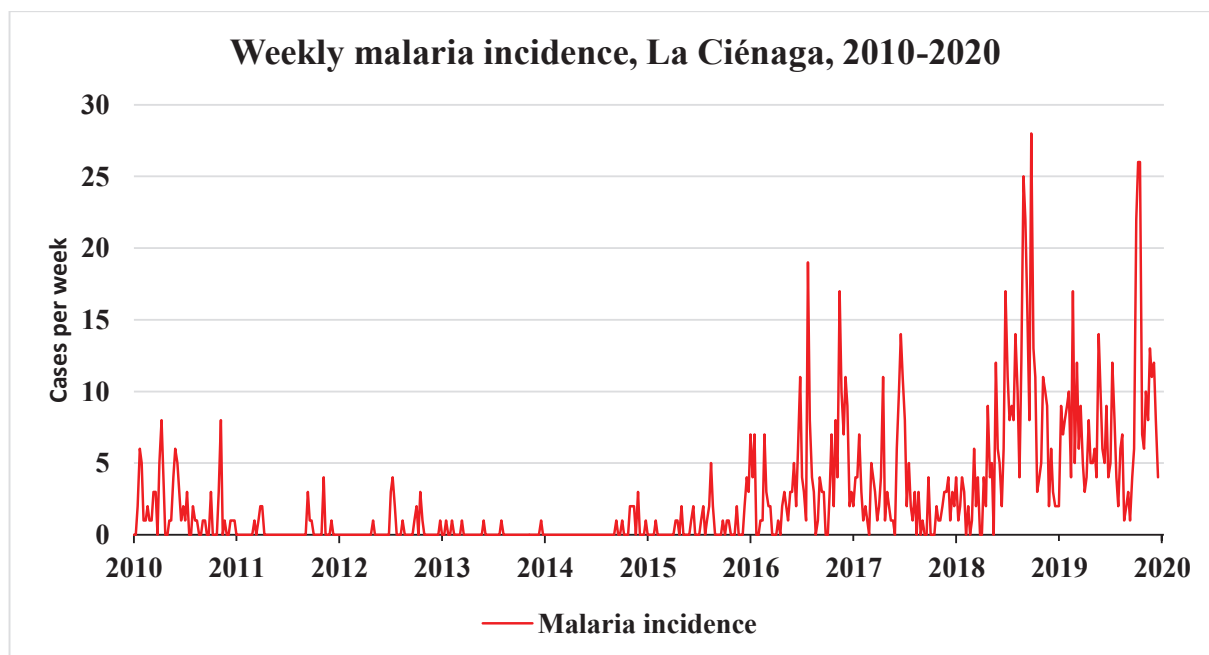
Figure 2. Weekly malaria cases in La Ciénaga transmission focus, 2010-2020.

office' refers to the publicly-funded, district-level Health Area Directorate with jurisdiction in La Ciénaga. The staff at this district office were tasked with new responsibilities for malaria under decentralization.

The district office was headed by a director and an epidemiologist who used surveillance data to dispatch a field team of roughly a dozen paid technicians to conduct home visits for surveillance, fumigation, mosquito net distributions, and education campaigns. Throughout the epidemic, the Ministry of Health ordered the district office to implement a '60-Day Plan,' in which field staff worked seven-day work-weeks for 60 consecutive days before reassessment and determination to continue for another 60 days. During this time, advisors from the central agency made regular visits to the district office to assess the quality and effectiveness of interventions and provide training and guidance. The central agency also deployed its own field teams (drastically reduced through decentralization) as trainers alongside district field staff.

Already, subtle signs of misdirection are discernible in this foreshadowing. Numerical case data appear to guide a scientific, rational response to malaria, but underneath each of the data points in Figure 2 are transformations: first,

an individual passes from a state of wellness to sickness; second, the individual's blood sample is interpreted as either positive or negative for malaria; and third, the individual's experience is reduced to a case count, a neutral metric. This description entails a sense of movement among people, materials, techniques, and objects. Along this 'chain of translation' social-material practices make certain phenomena knowable and comparable (Latour, 2005).

But they also do more: practices not only produce something (such as a graph of malaria incidence); they also *generate* a reality that fits with those methods and systems of knowledge (Law, 2009). Figure 2 does not exist 'naturally' but results from a large network of people and things: mosquitos and parasites, sick patients, clinicians, diagnostic tools, epidemiologists, spreadsheets, and scientific and analytical techniques. The result—a graph of case counts—*performs* for certain audiences, especially those with an interest in eliminating malaria. The challenge when viewing such a stable representation of reality is to remind ourselves of the multiple occasions for misunderstanding as people fall ill, seek care, are (or not) diagnosed, and are (or not) included in a database. Even from there, data are transformed

yet again as they are 'cleaned,' analysed, and presented to make claims or demand action.

Misdirection keeps us from seeing how Figure 2 is less a mirror of reality and more a performative artifact calling for a willingness to believe in its power to show what it purports to show (Holtrop, 2018). To unsettle common assumptions about malaria in Santo Domingo, I follow the perspectives of a patient suffering from malaria, clinicians struggling to make the diagnosis, community health workers going door-to-door to find more cases, and visiting malaria experts proposing a new intervention to slow the spread. Each ethnographic vignette reveals different ways in which misdirection 'invisibilizes' alternative realities: first, by suggesting that only one aetiology (and therefore only one form of treatment) exists; second, by diverting attention away from structural conditions in the health system to make diagnosis easier; and lastly, by drawing on a suite of scientific and technical practices to frame malaria as a de-politicized, biomedical problem.

Suffering from malaria: "stress sickness"

Wilson was a young Haitian man whom I met at Hospital Gonzalvo, a crowded public hospital where many residents of La Ciénaga sought care during the outbreak. When I met him, Wilson was quite sick, lying on an emergency room stretcher with his hand on his forehead, nauseated and fatigued. This, it would later turn out, was his second visit to Gonzalvo for the same illness episode.

That day, his rapid diagnostic test (RDT) for malaria was positive, so his attending physician alerted a field technician at the central agency. At the time, I was accompanying this technician in his daily work, much of which involved crisscrossing the city in a government pick-up truck to initiate medical treatment for malaria to patients in clinics and hospitals.

I struggled to understand why clinicians did not begin treatment themselves once the diagnosis was made. As I came to discover, a mix of issues, from over-burdened public hospitals and recent changes to malaria policies all figured into the seemingly straightforward process of diagnosing and initiating treatment for malaria. Under these conditions, a malaria diagnosis could actually lead to two, seemingly opposite interpretations of the same illness.

At Wilson's bedside, the doctor explained the need for treatment (Figure 3). Wilson sat up. Although he understood and spoke Spanish, another young man at his bedside spoke briefly in Haitian Kreyòl to him. Realizing that Wilson was Haitian, I chatted with him in Kreyòl, which seemed to put him more at ease. He took his first dose of chloroquine and primaquine under the

Figure 3. Wilson's second visit to hospital emergency room, where I met him. On the hospital bed are bottles of chloroquine and primaquine, medicine that he began taking that day. Photo by Hunter Keys, 2019.

watchful eye of my companion from the central agency. Before we parted, Wilson agreed to meet later at his home for a series of interviews. What follows is his account, shared over the course of three interviews at his little home in La Ciénaga after we met that day at the hospital.

Wilson lived on a small dirt path a few hundred meters off a busy, paved road. He lived in a one-room, wooden house in which a thin curtain hung from the ceiling to divide the cooking and sleeping areas.

He recounted how he moved to the Dominican Republic from Haiti. He was originally from Gonaïves, a large city on Haiti's coast decimated by Hurricane Jeanne in 2004. Wilson was unable to support his children in the aftermath of the hurricane, so he left for the Dominican Republic, crossing the border *anba fil*, or "under the wire," a colloquial expression to say without legal documents. He settled in a community of other undocumented Haitians on the outskirts of Santiago, a large city in the Cibao Valley. Unable to afford a visa, he spent his days as a carpenter, trying to avoid run-ins with the police. After being robbed by immigration authorities during a night-time raid, he left for the capital, Santo Domingo, where, he figured, there may be more work and social support.

The illness that led Wilson to Hospital Gonzalvo began a few weeks before his first visit to the emergency room. At first, Wilson felt tired and feverish, symptoms that he attributed, in his words, to *maladi strès*—"stress sickness." Malaria *the disease* never crossed his mind; in his understanding, a series of hardships had accumulated to such effect as to cause weakness (*pa gen fòs*) and "heavy head," or headache (*tèt fe mal, tèt lou*). As he put it, "Stress can make someone sick," making "you think about your life." I asked him what kind of stress does this, and he enumerated a litany of causes: lack of food; inability to send your kids to school; menial, low-paying work; and lack of money to send family in Haiti. "You wake up every day thinking about this," he said. In Haitian ethnopsychology, complaints such as headache and "heavy head" can signal mental distress (Keys et al., 2012). Wilson said that *maladi strès* was similar to *reflechi twòp*, or "thinking too much," another syndrome in Haiti associated with

worse depression and anxiety (Kaiser et al., 2014). Thinking too much about life's problems can even render someone *fou* (crazy).

For Wilson, stress sickness could not be cured at a hospital or clinic. Doctors, he explained, could treat only 'natural illnesses,' or *maladi Bondye*, such as fever (*fyèv*), hypertension (*tansyon*), diabetes (*maladi sik*, or 'sugar disease'), or the common cold (*grip*). I tried to understand how Wilson differentiated this recent fever caused by *maladi strès* from other fevers caused by 'natural illnesses.'

As he explained, *maladi strès* arose "between us, as people," rather than 'naturally.' In his telling, *maladi strès* resulted from discrimination, violence, economic insecurity, and living without legal documents. Wilson even said that *maladi strès* could contribute to natural illnesses like high blood pressure and diabetes—thereby requiring the intervention of doctors—but this would not resolve the underlying cause: that of *maladi strès*. All one could do was pray, continue looking for work, and hope to receive some kind of support or financial help.

Wilson's first visit at Hospital Gonzalvo seemed to confirm his suspicion that medical doctors could not cure this illness. As his symptoms worsened, his friends and neighbours convinced him to seek care at the emergency room. His medical record of that first visit stated simply, "Bronchospasm crisis," with nebulizers and steroids as treatment. "They did a blood test [presumably a hemogram], and said that everything was normal." After getting intravenous fluids, Wilson was sent home, feeling more confident that his illness was *maladi strès*, since, "the hospital did not give me the solution."

As his condition worsened, he went back to Gonzalvo a few days later. The decision to return to the hospital seemed to turn on a few key issues. First, he was disqualified from the public health insurance system because he was undocumented. This, in effect, left Wilson with few options anyway. As the closest publicly-subsidized hospital, Gonzalvo provided care almost free-of-charge, regardless of documentation or insurance status. Although he thought *maladi strès* arose from problems "between us, as people," Wilson did not think the illness was "sent" by another person with some nefarious intent. Such a scenario would require the intervention of a Vodou priest

or other healer (Khoury et al., 2012). Despite feeling that hospital doctors could not definitively cure him, Wilson still returned to Gonzalvo after taking the advice of friends and neighbours. Ultimately, this decision to return to Gonzalvo was based on parameters that were both flexible and constraining: a flexible understanding of the illness that granted doctors another chance to make a diagnosis (in their terms); openness to advice from others in the community; and lack of legal status and health insurance that left him with few alternatives.

Once back at Hospital Gonzalvo, Wilson was tested for malaria by RDT and found to be positive. Clinical notes listed the diagnosis as "febrile syndrome" with the plan to notify the central agency and collect a thick smear and another hemogram. Upon hearing this diagnosis, Wilson praised God "for leading me on the path to get the medicine." He completed the remaining doses of chloroquine at home and made a full recovery.

I asked him if he had ever heard of malaria prior to his diagnosis. "It's something the Ministry of Health is talking about," he replied matter-of-factly. Aside from suggesting that malaria was linked to trash, he could not describe what it was, how it was transmitted, or how one could prevent it. He still maintained that stress had caused his illness despite what appeared to dispel such ideas: the formal biomedical diagnosis, his compliance in taking anti-malaria medicine, and gratitude to the doctors and others who cared for him at Gonzalvo.

We (along with Wilson) appreciate malaria as both a biomedical diagnosis requiring specific treatment *and* as *maladi strès* brought on by social exclusion and structural violence. However, misdirection supports the assumption that only a biomedical solution is possible; it avoids questions of whether the government, health system, or other institutions have any responsibility to introduce 'socioeconomic treatment,' such as more public health funding, humane migration policies, and better living and working conditions for the poor. After all, it is worthwhile to recall that most countries successfully eliminated malaria within their borders through investment in socioeconomic infrastructure more so than malaria-specific interventions (Tusting et al., 2013; Packard, 2007). Regardless of how Wilson conceptualized or

attributed a cause for his illness (whether from psychosocial stress or parasitic disease), he essentially followed public health advice to seek care for fever. Aside from his own delay in seeking care when his symptoms began, the breakdown in timely diagnosis and treatment continued *after* he made contact with the health system: at his first visit, clinicians declined to test him for malaria. It appeared that the gaze of clinicians was focused elsewhere. This led to a key question: why, in the end, did the field technician from the country's central agency treat Wilson rather than the physician who finally diagnosed him?

Diagnosing malaria: "the platelets test"

"Doctors do not think about malaria," former patients and some field staff often complained. In conversations and interviews, a common pattern arose similar to Wilson's experience: people with fever and other malaria symptoms made repeated visits to the same clinic or hospital, had their blood drawn for a hemogram, were told they had a viral illness, and sent home. During this first visit, clinicians rarely used an RDT. Instead, they preferred hemograms to check the level of platelets.

For many in the community, the final diagnosis of malaria came through at-home testing by active surveillance teams, leading many to say that they trusted *la gente de malaria*, or "the malaria people," the field staff who went door-to-door diagnosing malaria, more so than doctors. "[The doctors] must do the malaria test!" exclaimed one former patient, herself finally diagnosed and treated by a field team at her home. Since "we are in an area attacked by malaria," she said, "a doctor must know [or be aware of] it."

To better understand why the diagnosis of malaria seemed to break down in the clinical setting, I spoke with clinicians at Hospital Gonzalvo and shadowed a doctor in the emergency room. In time, I came to see how important this hospital was for people in La Ciénaga: as mentioned above, care was nearly free-of-charge, a crucial feature for the mostly un- and under-insured population of La Ciénaga. There were other semi-public and private hospitals and clinics where people also sought care, depending on their means, but the

Figure 4. Triage, Hospital Gonzalvo emergency room. Photo by Hunter Keys, 2019.

unifying thread connecting their illness narratives was that regardless of care source, many were not diagnosed with malaria during their first or subsequent clinic visits. In fact, during my fieldwork, the average time from symptom-onset to diagnosis in La Ciénaga was seven days, a figure likely influenced by both misdiagnosis in health centres and delays in care-seeking by patients. This seven-day average was far from the recommended 48 hours (Dirección General de Epidemiología, 2020).

It was noticeable just how 'public' Hospital Gonzalvo was from the outside, where *moto-concho* taxi drivers angled around the exit and an overflow of patients waited on benches under an awning. Just inside, a throng of people stood in lines to speak with hospital administrators behind plexiglass windows and sat in a crowded waiting area; the message on posters to maintain *silencio, por favor*, was roundly ignored. The interior was dimly lit; there was an overall impression of too few resources for the volume of people in need. In a given year, Gonzalvo treats over 90,000 patients, most of whom share a socioeconomic level described as *muy bajo*—very low.

The emergency room cared for 100–150 patients a day. Only one or two doctors and a handful of nurses were available to meet this demand. At their disposal was a small stockpile of emergency medications, an oxygen tank, and a little wooden desk for a triage station (Figure 4). An ultrasound and EKG machine were down

a nearby hallway. This was a step up from the publicly-funded primary care clinics, that, as one doctor half-joked, "are lucky to have a stethoscope." Under these circumstances, clinicians had only a few minutes to take a quick patient history, develop a preliminary diagnosis, and order tests.

Clinicians confided that it was difficult to distinguish malaria from dengue or other febrile illnesses. "It could be a urinary tract infection, or just a common cold [*gripe*]," said one nurse. They remarked on the suite of vector-borne diseases that plague the capital: not just malaria but also dengue, chikungunya, and Zika. Features of the clinical history and physical exam could be helpful, such as the quality and pattern of fever or external signs like jaundice. Any sudden influx of patients with the same symptoms and coming from the same geographic part of the city signalled an outbreak.

Symptoms, clinical practices, and diagnostic technology mediate between patient and disease (Mol, 2002). For the doctors caring for febrile patients from La Ciénaga, the hemogram was most useful. "You must check the results [of the hemogram] against the reference values," he said, "to differentiate one infection from another." A drop in platelets could suggest dengue, while other changes, such as leucocytosis or anaemia, may indicate malaria. "The symptoms [of these infections] are all similar, but the analytical test shows changes [to help you] differentiate

one cause from another," one doctor told me. Although, following Wilson's example, malaria can simultaneously be a complicated psychosocial experience and a neutral disease state, practices and conditions of misdirection allowed for only one 'valid' interpretation.

Detecting hematologic changes required patients to come back for repeat testing, a practice that left an indelible impression on them. After their illness, some former patients recalled their platelet count from memory, as if to legitimize their symptoms or underscore the severity of their illness. The mother of a young patient said that after making a repeat clinic visit, "his platelets [had] dropped from 214 to 102," a common clinical finding from infection by *P. falciparum* but of limited utility in prognostication, triage, or management (Hanson et al., 2015). That patient's final (and accurate) diagnosis of malaria came some days later at another visit, where he was finally checked for the parasites.

Conspicuously absent in these stories and observations was consistent use of malaria RDTs, which are a recent advent in the country's clinical guidelines for diagnosing malaria (slide microscopy remains the gold standard in the country). Were there simply not enough RDT kits? This question met conflicting answers. In an interview, one doctor said that outbreaks could quickly deplete the supply; on other occasions, staff said that their supply was always well-stocked—accounts overheard in the same hospital!

The clinician I shadowed in the emergency room at Gonzalvo told me that they had indeed run out of RDTs, so only hemograms were collected that day. Patients with fever were sent home with a non-specific diagnosis, told to take acetaminophen, and return for a repeat hemogram later in the week.

A laboratory technician at Gonzalvo said that, "we call the [central agency]" for more RDTs, but according to the hospital director:

> We don't always have the rapid tests. We have to ask from the districts. We don't have a stockpile.
> *Author*: Why not?
> *Director*: I don't know […] It's their policy.
> *Author*: Of the district?
> *Director*: No, of the National Health Services. These are policies set by those at the top [*allá arriba*].

The director was alluding to the decentralization of the country's malaria program. Before 2015, all cases of malaria were clinically managed by technical staff from the central agency. Now, all programmatic and clinical responsibilities for malaria fell on local-level health districts and their healthcare centres, from primary care clinics to tertiary-level hospitals. This policy called for new supply chains for RDTs and their appropriate use in clinical decision-making. The transition had not been smooth; according to many, the central agency had been in charge of clinical management for so long that "doctors do not think about malaria."

Failure to quickly diagnose patients in the clinical setting could not be attributed to a simple lack of RDTs or because clinicians chose not to use them. Instead, it seemed that the almost mystical power of hemograms in clinical decision-making was rooted in larger issues of health system reform, changing guidelines and responsibilities, and resource scarcity. Amidst confusion and flux, hemograms offered clarity and confidence for clinicians, who acknowledged the poverty of their patients and sought solutions however they could, whether by prescribing the cheapest formulation of a given drug, providing pain relief, or giving intravenous fluids despite an unclear diagnosis.

Uncertainty pervaded this assemblage of care: patients wondered about the cause of their illness, over-burdened clinicians struggled to make a diagnosis, and hospital administrators navigated confusing policies and health system changes. In the end, the seemingly straightforward process of diagnosis—presumably made easier with RDTs—was actually quite ambiguous. Amidst this uncertainty, misdirection diverted attention away from health system dysfunctions and towards the 'truth value' of hemograms, inadvertently creating a pattern of misdiagnosis and inappropriate medical treatment.

Tracking malaria: "what should be"

"They are going to measure us" (*nos van a medir*), said a central agency executive to a group of district field staff in early 2019. The late afternoon sun filtered through the windows as the group sat together in the district office conference room.

The field staff had just returned from a long day of door-to-door malaria testing; their fatigue was palpable.

I had gotten to know this field team from days spent accompanying them in their daily work, plodding along the muddy footpaths of La Ciénaga in the afternoon heat, knocking on doors, and taking blood samples. A degree of companionship developed between us. Some spoke candidly about their lives, worries, and frustrations.

Perhaps their greatest concern was lack of consistent pay. During a break under the shade of a tree, one field technician leaned closer to me. His tone was serious; he worried what he said may cause trouble. They had not been paid in months, but given the scale of the outbreak, the Ministry of Health mandated that they keep working. "They're asking us to work without pay." The work did not correspond with a *pago digno*—a fair wage.

In the conference room that day, officials from the central agency needed to address poor quality blood slide collection and why surveillance forms had to be completed *siempre sistemático*—"always systematically" (Figure 5). District-level field staff were shouldering the bulk of the malaria response in La Ciénaga by then, with the central agency providing guidance and feedback. It was a challenging time; in the throes of an outbreak, the central agency was trying to assist and train a less experienced and under-funded district office.

The comment that, "they are going to measure us" deftly captured the influence of outside experts—in this case, the Pan-American Health Organization (PAHO), the "they" who would ultimately certify malaria elimination in the country. A 2019 technical document on malaria elimination in the Americas discusses "micro-stratification," or identifying and classifying malaria foci at a local level (PAHO, 2019). This involves epidemiological descriptions of cases in a given area, entomological and environmental characteristics, and gaps and needs in the health system—in other words, metrics that are needed to tell a particular story about malaria in a given place. A data-driven culture is crucial for tracking progress towards elimination: "the micro-stratification process depends on better and more specific data in order to understand transmission dynamics and organize the response or micro-plan" (PAHO, 2019: 25).

In the conference room, the central agency executive held up a surveillance form and continued: "All of this information is important, because PAHO will check our database." Sensing that the dynamic was slipping into criticism, the executive pivoted. "You are the ones out there spending the whole day in the sun, taking care of our neighbours, our cousins."

The effort to introduce and improve data-driven accountability for malaria control and elimination has been extensively documented elsewhere,

Figure 5. Malaria active surveillance form. Photo by Hunter Keys, 2019.

mainly in Africa (Gerrets, 2015; Tichenor, 2017; Okello et al., 2019). In late 2018, I observed executives, program planners, and consultants gather in the high-rise office suite of the Inter-American Development Bank (IADB) in downtown Santo Domingo. There, they pored over Excel spreadsheets and drew up algorithms to describe a forthcoming community-based intervention: training community members to do active surveillance themselves. Guiding this planning stage was PAHO's DTIR acronym: diagnosis, treatment, (outbreak) investigation, and response (PAHO, 2019). According to PAHO (2019), all suspected malaria cases are to be diagnosed within the first 48 hours by RDT or microscopy; all confirmed cases should start treatment within the first day of diagnosis; an outbreak investigation should start within the first three days after diagnosis; and each case or cluster of cases should trigger a community-level response within the first seven days of diagnosis. Visiting consultants were adamant this new intervention would be integrated into the existing health system, but, "DTIR is our guide," the representative from IADB said; things may be modified or adapted, but fidelity to norms was paramount.

A curious distinction arose in these high-level meetings. Everyone in attendance agreed on the importance of norms and standards, acknowledged as "what should be," or *lo que debe ser*; the challenge, voiced by Dominican colleagues, was grappling with "what is," or *lo que es*. This could relate to, for example, how notification of positive cases in the community *should be* done, but *how it really is*; or which reporting form *should be* used but which *really are*. At one point, one figure from the Dominican health system emphasized this difference between "reality and what we should do," to which the IADB representative reminded everyone: "We are thinking about what we should do."

A universal vocabulary was needed to articulate what *should* be done. "We must all use the same terms," an external consultant said at the start of another meeting. This quest for a shared vocabulary was essential to implement the malaria model they implicitly shared: malaria was a biomedical problem. "You have everything you need for transmission: the vector, parasite, and no

timely diagnosis and treatment," one consultant explained when asked why malaria was such a problem in La Ciénaga. This malaria was unlike that which had sickened Wilson, or the malaria that escaped diagnosis in an under-resourced and confusing clinical environment. Instead, this was malaria in its purest form—a biological parasite—now available for intervention by distributing bed nets, encouraging care-seeking for fever, scaling-up diagnostic testing, and prescribing anti-malarial medicine. In effect, the malaria experts created a circular system of knowledge production, whereby evidence in the form of indicator data and other universally-valid measures made the introduction of a particular technology or intervention seem common-sensical (Peeters Grietens et al., 2019).

Unmentioned throughout these discussions were patterns of diagnostic failure at clinics and hospitals or chronic under-funding of field teams at the district level. More than a year after those meetings at the IADB office, a clinic doctor gave a sobering account that clearly referenced the financial and structural limitations to meeting the expectations of PAHO's technical document:

> Imagine, you are asking these teams [of trained community members] to do active surveillance for seven consecutive days around the home of a positive case, and meanwhile, you have to give the three-day treatment to other positive cases nearby, and still do seven more days of active search, all without a vehicle, or enough gas, all in an area of rapid population growth.

In the planning meetings, the assumption was that more surveillance, this time by community members, would logically detect more patients, who would then be appropriately cared for once connected to the health system. Misdirection diverts attention away from structural and administrative challenges or the social nuances of implementing the project and towards collection of indicator data to represent the external world. In the words of one consultant, data "tell us what works and what doesn't."

That data began to trickle in at precisely the same moment that the country's political elite became engulfed in a giant scandal, one with fallout up to the time of this writing. In 2020,

the country's out-going president and certain political appointees—some within the Ministry of Health—were charged with stealing staggering amounts of public money. Consequently, a rigorous but agonizingly slow auditing system was put in place. This, in turn, affected the flow of IADB-financed loans inside the government, delaying monthly salaries to the newly-recruited community health workers and dealing a blow to their morale. In effect, misdirection constructs a 'frontstage' of neutral spreadsheets and incidence graphs, but backstage are human stories of disillusionment and dysfunctional governance.

Still, at the planning meetings, there was pushback against the universalizing discourse. For some, the language and conceptual roadmap were too self-contained and could not account for what was happening on the ground. "We must translate our language," one attendee said in private outside the conference room. Gesturing at the meeting, he said, "That's just technical talk. The dialogue is all one-way. What do these things mean to the people in the community?" Echoing the same sentiment, a field staff member remarked in private that the experts were too busy talking about theory. He looked up at the second-floor conference room from where we were seated outside and said, "Does anyone in that room actually know why there's malaria in La Ciénaga?"

Their remarks were a counter-narrative to the idea that the 'number-grammar' (Guyer et al., 2010: 37) of spreadsheets, algorithms, and standard definitions adequately grasped the messiness of malaria in the capital, a reality that those at the central agency understood, having worked so closely with communities over the years (Valdez et al., 2020). In our conversations and time together, central agency field staff, who had spent decades responding to malaria in the capital and building relationships in communities, continually referenced the need to cultivate spirit (*ánimo*) and calling (*vocación*) among recruited community members. When asked to explain her motivation, a newly-recruited health worker said, "We do not just worry about doing the [RDT]. It's about interacting out of friendship […] Sometimes, the person has not had a good day, or doesn't feel well."

"It is about showing your face [*dale la cara*]," said another. In short, it is about caring (Fig. 6). The empathetic comment that trained community residents were, "Spending the whole day in the sun, taking care of our neighbours, our cousins," acknowledged essential, humanist qualities in the struggle against malaria. Alternative realities of malaria were forming through human relationships of care and compassion, training and supervision, and disillusionment and feelings of neglect, all elements of a social world that—in the interests of malaria elimination—deserve more consider-

Figure 6. Malaria testing by central agency staff, Santo Domingo. Photo by Hunter Keys, 2019.

ation in program planning and response strategy. Misdirection effectively diverted attention away from malaria multiple and towards its construction as only a biomedical problem to be solved with technical solutions.

Discussion: multiple, hidden malarias

Malaria is a persistent problem in the Dominican Republic, which shares the last endemic island in the Caribbean with its neighbour, Haiti. Performance-based metrics, indicator data, and the 'hard' evidence of blood tests guide international funders, expert organizations, and care assemblages struggling to eliminate the parasite. These data are symbols in a powerful truth regime that calls for "what should be." Misdirection makes the solution to malaria appear obvious, obscuring the complex social relations, politics, local history, and difficult structural conditions that constitute "what really is" in Santo Domingo: that malaria the *disease* is but one of many realities.

The unexpected rise of malaria in the capital and ongoing slumification on the city's margins signal a rupture, both epidemiological as well as social. Santo Domingo, the historical epicentre of progress in an imagined New World, is a bustling metropolis where government-sponsored billboards proclaim in a public relations campaign, *Aquí, hay futuro*—here, there is a future. Yet a seemingly intractable outbreak of malaria in the capital, the "classic economic disease" once limited to rural areas, now slows the steady march of progress (Brown, 1997). So goes the rupture with past understandings of malaria's epidemiology.

The rupture is also social. Before, malaria outbreaks in the country were casually attributed to Haitian migrant workers, who were thought to import malaria from their home country where prevalence is far higher. Instead, malaria settled among the poor and crowded settlements on the city's edges, in places so fragmented they defy descriptions as cohesive communities. The *invasión* of people from impoverished rural areas into the city follows decades of structural adjustment policies and public-sector downsizing (Pomeroy and Jacob, 2004). Their immiseration contradicts the promise of those policies, which have instead transformed them into a new at-risk population, one now defined along economic fault lines rather than ethnic or nationalist divisions.

The social rupture ripples through a health system in which decentralization of the malaria program has sown operational challenges and confusion, contributing to breakdowns in care. Patients like Wilson follow the advice of public health messages nearly to the letter, seeking care for fever at places made available to them. Yet clinicians turn them away because the diagnosis is unclear—or rather, the ability, or even *responsibility* to make the diagnosis are too entangled to discern. Misdirection extends from clinic to community, where unpaid field staff tote along satchels of blood testing equipment and registers to write down, ever so diligently, the data they are told matter. These data, after all, "go in [the] database" to keep the process moving—and the money flowing, since program funding is increasingly dependent on performance-based metrics. Behind those metrics lies a different story, one less explored but crucial for the whole endeavour: how, and to what degree, spirit *(ánimo)* and calling (*vocación*) are cultivated and sustained.

In a world of ruptures, what might repair look like? A helpful starting point is to reflect upon "the importance of knowing about not knowing." Anthropologist Murray Last's study of medical pluralism among the Hausa people in Nigeria called attention to how little both patients and doctors needed (or cared) to know to bring about healing. "The patient is not interested in knowing the cures or the ideas [of biomedicine]; nor are the doctors necessarily interested in all the causes [attributed by the patients]" (Last, 1981: 387). Indeed, both chase a cure. A patient thinks his illness results from stress, and his clinician diagnoses malaria. The patient still takes the antimalarial medicine, but remains unmoved in his understanding of stress sickness. For public health professionals, it is easy to claim that only one of the two is 'correct' (Pelto and Pelto, 1997), but that misses the larger point: both do not know, or choose not to know, what is real for the other. Misdirection creates the sense that only one cure is necessary: medications to kill parasites. Malaria the social disease, or 'stress sickness' brought on by exclusion, discrimination, and structural violence,

calls for far more widespread and systemic reforms that require more creative thinking and political will outside the circular form of knowledge production in contemporary malaria practices (Kamat, 2013; Tusting et al., 2013).

The introduction of rapid diagnostic tests (RDTs) into this setting has not made diagnosing malaria the disease any easier. This stand-alone tool is praised for its utility and cost-effectiveness but is always embedded in a social milieu. Health workers may balance the use of RDTs against their own clinical judgment, desire to maintain professional reputations, or the expectations of patients (Chandler et al., 2012)—in short, the demands of everyday life. Here, hemograms came to replace RDTs because of clinician preference, resource scarcity, and unclear protocols following decentralization. "RDTs might function best when they can draw on the medical infrastructure that they were designed to extend in the first place" (Beisel et al., 2016: 3). Along with scaling-up the use of RDTs, there must be concomitant efforts to address the dysfunctionalities of the health system in which they are used.

Misdirection perpetuates itself by making RDTs *appear* as an irresistible fix to a complex problem. Introducing the technology into communities by way of field teams and trained residents requires a new set of metrics and indicators: number of RDTs completed in a given time period, number of new positive cases identified, or number of patients referred from community to clinic. All of this information must be carefully recorded, which overlooks the social reality in which it all takes place. Fidelity to standard procedures is "perceived as a better indicator of quality than the fidelity to empirical reality" (Peeters Grietens et al., 2019: 398).

That reality may very well contain patterns of data fabrication by those doing the work. Like the field staff in this study, those labouring in low- and middle-income countries to collect data face myriad challenges, especially unpredictable pay. Within expert cultures, these metrics are presumed to depict a neutral reality, but they are collected by human beings, people with their own struggles, worries, and aspirations. Poor morale and supervision and inadequate institutional support can lead them to fabricate or falsify data

as a way to subvert, resist, or redress tensions in the social-economic milieu (Kingori and Gerrets, 2016). 'Fake' data may in fact reflect a hidden, just-as-real side of reality, a possibility deserving more exploration in Santo Domingo.

The nascent project in Santo Domingo has shown some encouraging signs, though. While acknowledging the problematic nature of field data, more than half of all cases diagnosed in the community were picked up by trained residents in 2019 and 2020. This is part of the power of indicator data in the malaria elimination effort: they can inspire a sense of confidence and clarity about the problem of malaria. When trending in the right direction, the data evoke hope for an imagined future, one of a malaria-free island (Merry, 2011). Here, I have tried to destabilize the idea that numbers tell the whole (or even main) story of malaria in Santo Domingo by sharing ethnographic accounts along the chain of social relations that translates a sick individual into a case count compatible with spreadsheets and graphs. What escapes this process are the societal nuances and life worlds of the people involved in the production of those data (Holtrop, 2018). In recent follow-up interviews, trained community members describe a sense of inter-connectedness with neighbours, pride in one's work, and spiritual purpose. "[To] go directly to the person who's sick and give them medicine, I think this has no price," said one; "it is done out of love," said another. But much work remains: they ask for more consistent supervision and training, harmonization of their work with other interventions, respect for having a crucial role in the elimination effort, and especially, *pago digno*—a fair wage.

Practices of misdirection divert attention away from these and other complicated issues by taking malaria as a singular disease to be diagnosed, treated, and eliminated. Alas, this goal is not above the fray of politics and social ills; there is no 'one' malaria waiting patiently 'out there' to isolate and eliminate. These three ethnographic perspectives show how malaria acquires new forms and meaning through social and material practices, leaving unresolved the best way we should come to know this stubbornly persistent disease. In these circumstances, we may be better served by reflecting on a poignant question put forward

by Annemarie Mol: "[I]f we can no longer find assurance by asking, 'is this knowledge true to its object?' it becomes all the more worthwhile to ask, 'is this practice good for the subjects (human or otherwise) involved in it?'" (Mol, 2002: 165).

Acknowledgements

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"It's all in your head":
Magic and Misdirection in Medicine

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Abstract

In this contribution, we examine three stories of beneficent deception in medicine: the placebo machine invites children with treatment-resistant disorders to enter a high-tech machine and let their brains heal themselves; dementia villages extend validation therapy to the lived environment of geriatric care, supporting the illusion of living in the past through architecture; provocative testing relies on tricking patients suspected of fakery into experiencing seizures so that they can receive an expedited diagnosis. Enlisting the concept of misdirection from the realm of magic and theoretical contributions related to 'stories' and 'storying practices' from Feminist Science and Technologies Studies, we ask of each: Who is being deceived? Which 'characters' are given voice when these stories are told? How is deception justified? Following this, we question the onto-epistemological assumptions of reality and causation underlying each story and offer concluding thoughts on how 'magic' could be embraced within medical practice and research.

Keywords: misdirection, knowledge practices, clinical care, deception, placebo, clinical care

Introduction

Despite the adoption of autonomy as the central ethical tenet in Western medicine, deception remains ever-present across medical research and practice. Sometimes such deception is explicit, and at other times it takes on subtler forms. Discussions of such deception often examine the consequences and wrongs inherent in deception, but fail to consider the assumptions that loom behind its use. In fact, the instances in which deception is utilized, including the forms it takes, the patients that are deceived, and the justifications offered, can be remarkably revealing.

In this contribution, we examine three stories of *beneficent deception* in medicine, asking how the narratives that emerge around them operate to control the visual field and justify deception. Each case involves clear deception, in the form of lying or encouraging false beliefs in patients, and yet promises to outweigh the wrong or harm of such deception with clinical benefits. In the placebo machine, children with treatment-resistant disorders are invited to enter a high-tech, but 'inactive' machine and let their brains heal themselves. In dementia villages, validation

therapy is extended to the lived environment of geriatric care, supporting the illusion of living in the past through architecture. In provocative testing, patients suspected of fakery are tricked into experiencing seizures so that they can receive an expedited diagnosis.

On the face of it, each case involves an ethical wrong (deception) and an ethical benefit (beneficence) suggesting that the moral equation merely involves weighing the two against each other. Indeed, as will be shown below, this is how most ethical analyses of these cases proceed. However, behind the explicit deception seen in each case, *misdirection* is looming. Borrowed from the realm of magic, including emerging scholarship on the science of magic, misdirection can be understood as the intentional deflection of attention for the purpose of disguise" (Sharpe, 1988; Kuhn et al., 2014). As such, while misdirection may involve, or lead to, deception, it is primarily a form of distraction, leading one away from truth without necessarily denying it.

In taking up these three stories of beneficent deception through the lens of misdirection and feminist science and technology studies (F/STS), we aim to complicate the common moral equation, inviting analysis beyond the weighing of ethical principles and engaging the question of how misdirection operates in the way these stories are told. The realm of magic and the concept of misdirection can help to reveal how agency, acting, and story-telling are often veiled in medical stories of deception. Instead, stories of medical practice and research are often naturalized, made out to be the inevitable consequences of an objective expertise. At first glance, some medical feats may look like magic (she's healed!). But upon closer inspection, it is revealed that it is in fact the 'brilliance' of scientists and doctors behind the scenes who have learned their way around the human body, producing miracles of healing. As with magicians, doctors are praised for their ability to control and astound an audience, thus justifying a little trickery. Here, we question this narrative of magical, benevolent manipulation. Examining such healing as the result of a more *distributed agency* among various characters and components, we wonder if there might be an altogether different kind of magic at play.

This magic is not merely found in the advances of science, but is clearly co-made, 'configured' through an assemblage of actors. Noting this, we examine the real, but unrecognized, consequences (material, ontological, epistemological) that medical and research practices incorporating benevolent, and therefore acceptable/justifiable, trickery, can have on patients.

More importantly perhaps, we wonder about the *storying aspect* of these practices. In her work, Donna J. Haraway insists on the role of stories, storying, and narratives in the production of scientific and medical knowledge (Haraway, 1989; Haraway, 1996). Stories and story-telling, she argues, are an inherent and dominant feature of the production of knowledge. The concept of 'story' in scientific and medical practices allows her to reveal that theses practices are always *partial tellings,* 'framings', told from particular perspectives (e.g. socio-historical, cultural, gendered, racial, classed) and inherently social, political, cultural, etc. This partial knowledge, derived from stories, shapes both ontological and epistemological assumptions, and informs how scientists view and act in the world, and the subsequent stories that can be told or not and on which one can act or not. Put otherwise: such stories have various consequences that are at once material and discursive.

Philosophers of science and scholars of Science and Technology Studies (STS), particularly feminist ones, who embrace the *ontological turn* in the sciences[1], document how scientific knowledge production is performative, in that it participates in shaping the objects of knowledge rather than simply discovering them and representing their 'essences'; (Pickering, 2017; Woolgar and Lezaun, 2015; Åsberg, 2010). In this new ontology, sciences 'work' (they produce knowledge) because they intervene in a real that is dynamic. They are only and always *interventions,* i.e. active practices that 'know' by participating/affecting the ongoing configuration of a world-as-becoming, in-an-ever-making (Alaimo and Hekman, 2008; Barad, 2007). Furthermore, they are intervening in a real that is not fixed, and therefore available to representations, but dynamic, always changing, in the process of 'being-made', but where the 'materiality' of matter warrants careful attention because these

transformations can never be erased, but only responded to. They can change again, but not in an infinite number of ways. This recognition that the sciences are actors in shaping our world (and thus making ontological and ethical changes), however, remains marginal at best. Epistemically, knowledge practices continue to be practised as if pure objectivity, neutrality, and distance can be achieved.

In this contribution, we invite these insights emerging from F/STS into the realm of medicine and health research with a particular focus on uses of *beneficent deception*. Our methods involve a detailed analysis of three examples of beneficent deception in medicine, particularly of the 'story-ing' they enact, we examine how these stories are told, what assumptions underlie them, and how they misdirect audiences, both those directly involved and those at a distance. We utilize a variety of texts to represent these stories, including academic publications from medical researchers, clinicians, bioethicists, and social scientists, as well as narratives found in the media. These texts offer a glimpse into the ways these stories are told by those who have the most control over the narratives that circulate around placebo machines, dementia villages, and provocative testing, leaving space for our analysis, which utilizes both the analytic of misdirection and the tools of F/STS.

In light of each story, we ask: Who is deceived within the stories? Which characters are given voice when these stories are told? How is deception justified in these stories? With our own analysis, undeniably, we, too, are telling/ creating stories – but other ones, and perhaps ones that are – we hope! – more positive, ethical, *freeing.* Hence, echoing Haraway and embracing her proposal regarding the role of stories and storying in science, we propose our analysis as a way to *enable storying,* that is, to create an occasion for more stories about these cases to be told and, perhaps, to permit new configurations. With this analysis in hand, we suggest that there is great potential laying within the tools of 'magic', including magical misdirection, but that how such magic is currently used and framed in medicine restricts this potential from emerging[2].

Three Stories

The Placebo Machine

> Experimenter: You know when you're playing outside and you get a scratch on your hand? What happens to it?
> Participant: It heals.
> E: And what do you have to do to make it heal?
> P: It just heals on its own.
> E: That's right. The body heals on its own—you don't have to do anything. That's what we study. Just as your body knows how to heal itself, your brain knows how to heal itself as well.
> (Olson et al., 2021: 3)

The placebo machine was dreamt up by Jay Olson, a magician and placebo researcher, whose first magic show took place when he was 7 years old, and Samuel Vessière, an anthropologist and cognitive scientist with a diverse research program (Haldane, 2019). The research project, described in detail in the paper "Super placebos: A feasibility study combining contextual factors to promote placebo effects" published in *Frontiers in Psychiatry*, brought together lessons they had learned both from the science of magic and the science of placebos. Eleven children with various treatment-resistant conditions (e.g., Attention Deficit/Hyperactivity Disorder, Tourette Syndromes, migraines, skin picking) were recruited to take part in the study. Before encountering the placebo machine in person, children were shown a video of celebrities talking about the special opportunity those recruited to the study had to experience a machine that can help the brain heal itself. A month later, participants were invited to the lab, where they first met with the researchers, who were dressed in lab coats, a science communicator, and a camera crew from Los Angeles there to document the "novel procedure" (Olson et al., 2021: 3).

First, children were briefed, reminded that the procedure will help their brain heal itself and told by another child (a 'peer mentor') about how well it had worked for him (Olson et al., 2021). Then, a 15 minute interview took place where the children were encouraged to focus on their strengths and build positive expectations about their experience with the placebo machine. Finally, participants were taken into the scanner room, where an

impressive (but inactive) MRI (Magnetic Resonance Imaging) machine stood, accompanied by "space music" (Olson et al., 2021: 3). Children entered the scanner for 15 minutes; while inside, they were encouraged to focus on the "mental superpower" they want to develop and given suggestions like "As you slide deeper into the machine, you will find yourself feeling more and more relaxed and focused" (Olson et al., 2021: 5). Positive suggestions were again given after the scan and each child took home a watch that would buzz periodically and show a positive icon like a smiley face. Each participant came back a week or two later for another "sham MRI session" and then again for an exit interview. Follow up found that "ten of the eleven parents reported improvements in their children following the sessions. Two children showed near-complete cessation of symptoms" (Olson et al., 2021: 5).

Dementia Villages

> "It's a little bit Disneyland, a little bit Las Vegas and a lot more fun for residents than a sterile nursing home."
> (Rogers, 2018)

In his contribution to the anthology *Care home stories: Aging, disability, and long-term residential care*, Alzheimer's expert Peter Whitehouse describes the increasing trend in long term care towards helping people with dementia to feel more at home "by allowing them to bring personal furniture and mementos when they moved in" (Whitehouse, 2017: 106). While he is supportive of this trend in general, Whitehouse notes that one facility he visited, a *dementia village*, "took this attitude to such an extreme", noting that the "unreal reality" he encountered there made him feel uncomfortable (Whitehouse, 2017: 107).

Dementia villages refer to an emerging architectural design for long-term geriatric care facilities and represent a social approach to caring for the elderly who are experiencing cognitive decline and dementia. These villages extend validation therapy from words and actions to the lived environment: "the facility creates an environment that is designed to mask the dementia by pretending that the residents are in an earlier time and place" (Whitehouse, 2017: 107). Residents

in dementia villages are validated not only in their interactions with caregivers (dressed up as postal workers or grocery store clerks), but in the buildings, the furniture, the posters on the walls. Seen as an optimal design to foster, maintain, and promote autonomy as well as independent living for the person experiencing dementia, geriatric facilities are designed as villages, often from another time (e.g. 1950s or 1960s), and decorated as if they were local and pedestrian 'village hubs'. Describing his visit to De Hogeweyk, the first dementia village, built in the Netherlands in 2009, Whitehouse notes that the units "were designed to match various forms of Dutch social life (one even mimicked Indonesia for those who immigrated to the Netherlands from the former colony)" (Whitehouse, 2017: 107).

Since the opening of De Hogeweyk (also known as Dementiaville) the model has spread to the United States, Canada, the UK, and Japan (Biggs and Carr, 2016; Iakovou et al., 2019). Echoing the grand hotels of Las Vegas and the rides of Disneyland, dementia villages use the art of simulacra while suggesting that geriatric care need not be cold or a source of further trauma, but can be made into a pleasant, even dreamy, experience where those who have cognitive decline can reminisce about their past and be validated by their surroundings. Often compared to the Truman show, corridors in dementia villages are often decorated to mimic outdoor pedestrian streets and alleys, residential rooms' doors are painted as if they were individual homes, and flowerbeds, false windows, and benches decorate common areas. Aimed to both provide comforting and familiar homes for residents, that also recall and even re-enact aspects of their past, dementia villages hypothetically facilitate the agency of people with dementia. Despite these good intentions, Whitehouse wonders if perhaps we might be better off with efforts to support people with dementia to "navigate their own 'real' community", engaging in a form of "playful reminiscence" rather than the "serious fakery" entailed by dementia villages (Whitehouse, 2017: 107).

Provocative Testing

The goal of distinguishing between patients who are telling the truth and patients who are faking it

has a long history in Western medicine (Goldberg, 2021). In many such cases, telling the truth is shorthand for symptoms for which a physical cause can be identified, while faking it is a stand-in for unknown or psychological causation. Provocative testing involves using deception in order to diagnose psychogenic non-epileptic seizures (PNES) (also known as pseudoseizures, or spells), seizures that are not caused by epilepsy and are thought to be psychological in origin. In his bioethical analysis of the topic, James Bernat introduces us to Ms. Lamonica, a 38 year old patient, 'in good health except for being overweight', who presents for a neurological evaluations after experiencing at least two seizures (Bernat, 2010). During these seizures, she was awake and did not display any confusion afterwards, which leads her neurologists to "suspect that her episodes were nonepileptic seizures" (Bernat, 2010: 854). The chief neurologist decides to use *provocative testing* to confirm this suspicion, so the nature of Ms. Lamonica's seizures can be uncovered, and quickly.

To this effect, Ms. Lamonica first has EEG electrodes attached to her scalp and an intravenous catheter inserted (Bernat, 2010). She is informed that a solution that typically provokes a seizure will be administered. This is, however, false. The solution is simple saline, a pharmacologically inactive substance which acts as a nocebo, generating negative expectations and provoking a seizure in some patients[3]. Ms. Lamonica is told that if a seizure occurs, the administration will stop, and, consequently, the seizure. If the EEG reading is normal throughout the seizure, it is concluded that the nocebo effect, operating through negative expectations, caused the seizure, not the substance. In such cases, the patient is 'caught out' and the psychological nature of the seizures revealed. The neurologist will then likely refer the patient to a psychiatrist. This was the case for Ms. Lamonica, who had a seizure after the saline administration while her EEG recording remained normal. Afterwards, we are told, the neurologist "wrestled with the question of whether to tell Ms. Lamonica that the provocative test had been a ruse" (Bernat, 2010: 855).

Telling these stories otherwise: It *matters* how stories are told

As Haraway points out, "it matters whose stories tell stories" and stories *matter* (Haraway, 2019: 565). How stories are told and by whom have multiple effects, many of which are not or cannot be known, and are often not considered. Furthermore, stories are also never the sole domain of the *discursive*; they incur *material* effects and they also are *performative*. In this section, we examine the telling of these stories in greater detail. We ask: Who is deceived within the stories? Which characters are given voice when these stories are told? How is deception justified? Through our analysis, several forms of misdirection come to light. We reveal how these stories do not merely describe the world, in an objective fashion, but select certain characters, create particular narrative arcs, and point towards specific arguments. In doing so, other characters are hidden, different narratives become invisible, and some arguments slide out of view. As such, these tellings constitute an ongoing and surreptitious form of misdirection, one that is not always intended or even known to those doing the telling; and all have various, *material* consequences, that should not be sidelined.

Crucially, through our analysis of these stories and the misdirection contained therein, we are telling new stories. In doing so, we hope to reveal the way in which all of these stories, those we analyze and those we produce, are partial and limited. In constructing alternative stories, however, we aim to show that it is possible to *open up* to more productive uncertainty in medical practices and research. These new stories, we hope, may open up more onto-ethical medical practices, favoring relationships, and fostering new knowledge of health, illness, and healing. Current 'framings' and stories can reinforce simplistic and ultimately dangerous notions of reality and causation in biomedicine, that warrant a reckoning. As a result, we also advocate an *ethic of response-ability* in taking up magic in medicine.

Who is deceived within in these stories?

In each of these tellings, some characters take on the role of the 'magician', doling out deception, while others constitute 'audience members', on

whom the trick is played. It is noteworthy who is selected for each role. Magicians, those who are in control and writing the script, generating the experience for others, are played by the experts in each scene. In the placebo machine experiment, researchers take up the task of creating an illusion of neuroenchantment for participants (Ali et al., 2014). In dementia villages, architects, health professionals, and orderlies, all engage in daily deception to produce a novel 'reality' for residents. In the clinical practice of provocative testing, doctors attempt to trick patients into experiencing pseudo-seizures, to determine if those seizures are *really real*. Audience members are on the receiving end of the 'entertainment', unaware of what is taking place behind the scene and uninvolved, construed as both passive and active: they participate in the action, the 'doing', but unknowingly and unintentionally, while following along, *somewhat* willingly. The choice of which patients are to be deceived in each story is revealing; these characters and their descriptions invite paternalism, welcomed in the name of benevolence, thus misdirecting readers away from their agency and towards the importance of others acting in their best interest.

Placebo Machine

Lying to children is widely accepted, from Santa Claus and the Easter Bunny, to where a dog goes after it dies, to whether a dish contains broccoli. Paternalism, in the form of deciding for children, is also commonplace: what they eat, where they go to school, and where they live, are all choices frequently made by others for their wellbeing. Children are construed as imaginative, playful, and trustworthy, making them ideal audience members for a magic trick. The placebo effect is a particular kind of medical 'magic' that many argue is real and powerful yet has not been exploited enough (Benedetti, 2009; Miller et al., 2013). To perform such magic, children constitute ideal participants given the desire of many of them to play along and to please. Interest in placebo effects in children is longstanding and suggests there may be an increased power of placebos in those who have yet to grow into skeptical adults (Weimer et al., 2013). However, some placebo scholars raise questions about whether these documented

placebo effects exist in the children themselves or whether they might be better understood as instances of 'placebo by proxy', where hopeful parents and teachers report positive changes in a child's behavior, driven by their external expectations (Whalley and Hyland, 2013; Waschbusch et al., 2009).

In the context of the placebo machine, the children selected to participate are especially good contenders because they have a hodgepodge of conditions (e.g. ADHD, Tourette Syndromes, migraines, skin picking) found to be responsive to placebo treatments (Olson et al., 2021). The participants had also "already undergone conventional treatments with little or no effect" (Haldane, 2019). Because of this, ethically dubious interventions, such as those involving deception, are more likely to be accepted: there is little available for these patients. Such interventions may be seen as 'better than nothing', since the medical apparatus has often, in a sense, given up on them. In some cases, this desperation can boost the expectations of parents and children alike, contributing to increased placebo effects. Yet in other cases, they may feel hopeless, as nothing has worked, generating nocebo effects instead.

Dementia Villages

In dementia villages, those on the receiving end of the deception are also unlikely to raise significant concerns, given the preponderance of deception that already exists in their care. Practices, attitudes, and guidelines regarding deception are frequently discussed in literature related to the care of individuals living with dementia (Tuckett, 2012; Cantone et al., 2019; James et al., 2006). Validation therapy offers an example of such a focus, suggesting that rather than fighting against or repeatedly correcting the beliefs and impressions of those with dementia, we ought to validate them. As one therapist working with patients with dementia put it, "It's much better to validate with them and let them think what's in their mind is real than to disillusion them. They are happier in their little world" (Tuckett, 2012). Given the normalized uses of deception in dementia care, a little more blurring of the truth may be viewed as harmless.

Playfulness and deception also often go hand in hand. One nurse describes her approach to care of dementia patients: "I bullshit with those residents who are not in reality. You play along with them, those with dementia" (Tuckett, 2012: 13). The notion of playing with patients highlights the parallels between how patients with dementia and children are seen. As with children, the autonomy of patients with dementia is often considered non-representative or inexpressible, and so is often overruled or not considered. Dementia patients are also often compared with children or described as exhibiting 'childlike behavior'. In describing the results of qualitative interviews with family members of people living with dementia, the authors noted that childlike behaviors were often used, including "playing with soft toys, mimicking a child's voice or playing and running about" (Tyrrell et al., 2020: 6).

Provocative Testing

Who is most likely to be subjected to the trickery of provocative testing? Because infusing saline along with a nocebo expectation aims to catch a patient in the act of fakery, it is unsurprising that those implicated in this 'magic show' are those who tend to raise the most suspicion amongst health care professionals. Takasaki and colleagues remark that there is a "preponderance in adolescent females" in the population that suffers from PNES (Takasaki et al., 2016: 4). These patients are often reported to have "dramatic, emotional, and erratic" personalities, igniting stereotypes of teenage girls and attention-seeking performances (Takasaki et al., 2016: 4). What's more, these patients often have psychiatric comorbidities, especially in children and adolescents diagnosed with psychogeneic seizures, 84% and 49% of whom respectively have also been given a psychiatric diagnosis (Takasaki et al., 2016). In adult patients, personality disorders appear to be common in patients diagnosed with PNES, particularly those associated with cluster B, which are often linked to histories of sexual abuse from a trusted other (family member or friend) (Takasaki et al., 2016; Kanner et al., 2012; Devinsky et al., 2011; Bernat, 2010). Those diagnosed with such personality disorders are among the most despised and disparaged of patients in health care. "Derogatory

and cynical" jokes about patients with borderline personality disorder are common in medical schools, while clinicians often see such patients as not suffering from a 'real' illness, blame them for their own suffering, and view them as a drain of medical resources (Kealy and Ogrodniczuk, 2010; Wear et al., 2009).

Unsurprisingly, patients are aware of their suspicious status within clinical settings. In qualitative interviews with patients diagnosed with PNES, a common theme across patients has been "a perceived lack of understanding or disbelief by professionals" (Rawlings and Reuber, 2016: 106). As one patient put it, "As long as others understand me, and don't think I stage or simulate seizures, it is all right" (Karterud et al., 2015: 110). The provocative test is likely to affirm such concerns in patients. Not only do they feel distrusted by their caregivers, but those caregivers have devised tests in order to catch them in their perceived dishonesty, and in doing so, document a justification for their distrust. As such, patient distrust is well-founded, and it is unsurprising that feedback loops are often created between the distrust of providers towards patients and distrust of patients towards providers (Buchman et al., 2016). This should give one pause in thinking about the ways of relating that may be engendered through the use of terms like 'treatment resistant', 'non-compliant', or 'difficult patients', which often circulate in medical settings, particulary those dealing with the 'psychosomatic' terrain (Chamberlin, 1998).

Paternalistic magic?

Western medicine is known for its long tradition of paternalism, particularly in areas of medicine concerned with the mind, as in each of these cases (Code, 2018; Code, 2006; Munthe et al., 2012; Loignon and Boudreault-Fournier, 2012; Hansson and Fröding, 2020). The authority and superiority of the doctor is cultivated in a multitude of ways and places, within healthcare organizations, among the profession itself, but also societally. The knowledge of the doctor is seen as exclusive, an authority with limited access. Western history is fraught with instances where the medical profession has been used to deprive others of their knowledge, experiential or other (Merchant, 1981;

Code, 2006). Such instances are especially common in cases of those who are defined by their unreason, by virtue of being considered mad (Foucault, 2003).

Such paternalism can also be seen in the selection – *storying* – of the patients chosen for beneficent deception in medicine. Who better than children, aging adults with cognitive impairments, or women who might be 'faking it', and particularly those with conditions seen as hopeless? Because we're used to seeing each of these groups treated paternalistically, they are natural and fitting audience members when it comes to deceptive practices in medicine. Selecting such participants as candidates for beneficent deception is a form of misdirection; it invites us to focus on their lack of autonomy and the likelihood of benefit, as opposed to the trickery involved.

Which characters are given voice when these stories are told?

Another form of misdirection can be found in the way 'characters', in each of these stories, are given, or not given, voice. In each story of medical innovation, characters must be developed and described. As we have seen, the characters being deceived and those doing the deceiving fit within preconceived notions of control and agency. But who takes center stage in the telling of the story, of the regaling of the trick, depends on how successful it was. A magician is celebrated for a remarkable trick, just as researchers, architects, and doctors are congratulated for their successes. In cases when these experts fail to execute their vision, however, other lines of visibility, responsibility, and blame are drawn.

Placebo Machine

In Olson et al.'s (2021) reporting of the placebo machine, the voice of only one participant from the experiment appears within the authors' manuscript. This participant, 12 year old Maria, had been compulsively picking her skin, while awake and asleep, for two years. Her mother has been required to bandage her arms and face each morning and she frequently developed skin infections. However, after her experience with the placebo machine (including an additional session provided by the researchers), Maria experienced a miraculous recovery. While all other participants are spoken for by their parents or by the researchers within the article, Marie is quoted directly:

> At first I was confused, because I was just going into the machine and I was like, "What is this doing?"... And then after another two sessions, I started to notice you feel more relaxed, calm, confident. And I noticed I wasn't picking as often. I didn't have the urge to pick.
> When you [exit the machine], you learn how to lie down and go into that same state that you were in inside the machine, and after a few sessions, you don't even need the machine any more. So if I have another problem, I can just do it myself now. (Olson et al., 2021: 5-6)

An ideal audience member, Maria offers compelling evidence for the magic of the placebo machine: not only does her urge to pick disappear, but she is able to access the healing qualities of the experiment on her own, without the need for the elaborate show contained within the experiment. As suggested by the researchers, *her brain is healing itself*.

Those who did not fare as well as Maria are given much less voice within the scientific story of the placebo machine, however. In particular, one child who participated in the experiment "demonstrated no noticeable improvement" (Olson et al., 2021: 7). While very little is said about the participant, the authors point out that the 6 year old "was oppositional with his mother and the experimenters", "showed little interest in the procedure", and "expressed scepticism about the machine" (Olson et al., 2021: 7). It seems that, in this case, the audience was uncooperative and unwilling to play along with the magic trick. In analysing the lack of effect of the placebo machine on this participant, the researchers point to the 'oppositional' nature of the child as well as his 'scepticism', suggesting that the failure of the experiment can be located 'all in his head'. Nothing is said about other factors that may have contributed to the child's experience, directing blame and responsibility solely towards the 6 year old child who lacked enthusiasm for the placebo machine. This type of narrative is common in placebo research, in which one's attitude or mindset is often thought

to be an essential ingredient of the causal story (Friesen, 2019). These dual explanations, in which a participant is blamed for an unsuccessful experience, and the magic of the experiment credited as a successful experience, misdirect audiences towards one form of causation when results are positive and another when results are negative.

Dementia Villages

In discussions of dementia villages, the voices of the most crucial audience members, those living with dementia, seem entirely absent. Despite reading widely on the topic, we could find no retelling which included the voices of residents or lived experiences of the villages. Instead, the comfort of family members dominate in discussions of dementia villages. An article describing a Canadian dementia village simply called *The Village* (in Langley, near Vancouver) includes pictures of a mother and daughter, the former being a resident of *The Village*. Interviews, however, only include the daughter's experiences. Residents are mentioned throughout the article in relation to their ability to "roam free" and "wander", inviting comparisons with animals or children (Griffin, 2019). Moral discussions of dementia villages also center around family members, especially the difficult choices they must make about where to "put" their loved ones[4]. This focus naturalizes the idea that those with dementia or cognitive decline cannot be involved in decision-making processes or have autonomous goals, needs, values, or desires. Communication with them is seen as impossible, rather than difficult or different. People with dementia are construed as entirely and irremediably lost in their heads, their independent realities, inaccessible to others who are required to make decisions for them[5].

Provocative Testing

Here too, the voices of those most likely to be administred provocative testing are mysteriously absent. A recent systematic synthesis of 21 qualitative studies describing the experiences of patients who have been diagnosed with PNES, the topic of provocative testing does not arise once (Rawlings and Reuber, 2016). Despite being a common topic in medical literature related this condition, the views of patients on these decep-

tive tests seem not to be sought within qualitative research. The absence of patient voices serves to create particular kinds of characters in the stories told about provocative testing, those that 'raise suspicion' from medical practitioners in terms of their capacity and likelihood to 'tell the truth'. In contrast, despite lying to patients, clinicians are described as beneficent and worried about engaging in such deception; as one paper puts it, "Courage is needed to communicate the diagnosis, which may be emotionally taxing for all parties involved" (Takasaki et al., 2016: 7). Patients, in contrast, are portrayed as suspect, thus reinforcing notions of responsibility and blame that linger in the background of stories of provocative testing, but also justifying that doctors must make those difficult decisions of choosing deceptive means, to help the patient – *in spite of themselves*. Furthermore, the test doles out responsibility for one's suffering with immediacy and certainty. The provocative test is said to determine *once and for all* the cause of the patient's seizures – particularly whether the source of their suffering is 'all in their head'.

Partial Stories

These stories are revealed here as *partial* stories (Haraway, 1988)[6]. All tellings are partial (perspectival and incomplete), but the vast majority are told from the point of view of omniscience in Western culture, as Haraway (1988) points out: the way the story is framed, as precisely *not* a story but the 'sole presentation' of facts[7]. As a result, no other storyline is allowed. The medical stories presented above stem from the perspectives of magicians, of experts; readers are thus (mis)directed towards some characters in these stories and away from others. With the exception of Maria and her miraculous recovery, essential players in these stories vanish within their tellings. Yet despite their invisibility, 'audiences' – those on the receiving end – play a crucial role in successful magic tricks. A magician cannot perform to an empty room, just as researchers require participants, architects require dwellers, and clinicians require patients, on which to exercise their expertise as well as explore innovative techniques. Every telling makes choices, highlighting some parts of a story and leaving some out, conveying what is deemed

valuable or not, what *matters* or not. In these stories, some characters are made up as good/responsive (Maria), as bad/non-compliant (the skeptical child), as invisible/non-communicative (residents of dementia villages), or as untrustworthy/malingering (patients presenting with uncommon seizures). As such, new kinds of patients are made up, and with them, new spaces of possibilities, new moral concerns, and new medical practices arise (Hacking, 1986).

How is deception justified within these stories?

Across each of these stories, deception looms large, and those writing the stories are well aware of its centrality. In discussions of the placebo machine, dementia villages, and provocative testing, ethical musings on deception take up considerable space. Misdirection takes place here too, following a familiar bioethical arc, in which beneficence and autonomy are in conflict, and one must be chosen to win out. In each of these stories, the importance of the benefits gained from deception are emphasized and the losses associated with being lied to are downplayed, directing readers away from the risks of dishonesty in medicine and towards the fruits that can be gained from such dishonesty.

Placebo Machine

Despite placebos being known as "the lie that heals" (Brody, 1982), the researchers behind the placebo machine offer a nuanced discussion of the way deception shows up in the project. On the one hand, they note "in our study, there was little lying"; on the other, they admit "the procedure used copious implicit deception" (Olson et al., 2021: 7). As a result, deception in the placebo machine experiment is complicated to trace. The researchers note that on the initial phone call: "We fully briefed parents on the procedure, explaining that it was non-invasive and based on the placebo effect as well as positive suggestion" (Olson et al., 2021: 3). Later, before entering the scanner, participants and their families were told that "everything that we say and do, everything you see around us, this equipment, these lab coats, as well as the machine" is part of the suggestion procedure

(Olson et al., 2021: 3). Despite this, a number of aspects of the study mislead participants and their families into thinking that the machine is *anything but* inactive: when entering the scanner room, participants and family members were asked to remove any metal objects from their pockets, an action that might quickly replace an understanding of the machine as inactive as one that is active (Olson et al., 2021). In addition, celebrity endorsements, lab coats, high-tech equipment, cognitive reframing, positive suggestions, and the camera crew, all suggested that the machine was something special (Olson et al., 2021).

Olson and colleagues, well aware of the dynamics of magic shows, note that "telling audiences that a performer is a magician does not stop them from believing the magician has supernatural powers" (Olson et al., 2021: 7). Similarly, with the placebo machine, children and parents alike continued to act as if the scanner was active and powerful, even after being assured that any healing was self-healing. Olson and colleagues suggest, in response to this complex reality, that deception should not be thought of simply as lying or failing to tell the truth, because implicit factors can deceive just as much as explicit statements. Instead, they offer, deception might be best conceptualized as "based on its outcome (i.e., participants holding false beliefs) rather than its process (i.e., the type of deception used)" (Olson et al., 2021: 7). This suggestion aligns with an emerging research programme focused on open-label placebos, placebos given to research participants who are well aware that the pills they are taking are 'mere placebos', but who have been encouraged to think about the power of placebo effects and take the pills in a regular, ritualized way (Kaptchuk, 2018). Some of the early experiments involving open-label placebos have been remarkably successful in generating symptom relief in research participants who suffer from migraines, chronic low back pain, and irritable bowel syndrome, as well as children with diagnoses of ADHD (Kaptchuk et al., 2010; Kam-Hansen et al., 2014; Carvalho et al., 2016; Carvalho et al., 2020; Sandler and Bodfish, 2008). This research indicates that the narrative of placebos as merely lies that heal may be too simple. Instead, it opens up space for a more complex, and perhaps more magical,

understanding of placebo effects, one that doesn't require (explicit) deception for success.

Despite their honesty about deception, the manuscript by Olson et al. contains an implicit argument in favour of using deception in medicine for the sake of beneficence[8]. By highlighting the stories of success and downplaying the narratives of 'failure' with the placebo machine, the authors shape a story of promise, of healing potential, that outweighs any concerns about autonomy that may be bubbling up in the background.

Dementia Villages

Misdirection in discussions of dementia villages acts at the level of directing attention and awareness away from other questions and critiques of geriatric care facilities and the 'management' of aging adults with cognitive issues. This is done notably by creating a false dichotomy and therefore a false choice between two, oppositional, options. This dichotomy offers, on the one hand, the cold, depersonalized, fluorescent geriatric care facility that is associated with possible (re)traumatization and exacerbation of ill-health, aggressive behavior, confusion, disorientation, and depression, and, on the other hand, dementia villages, described as warm, familial, friendly, comforting, playful, innocent, validating, and fuelled by good intentions. As Adams and Chivers have pointed out, dementia villages, construed as caring villages, offer "a direct counterpoint, in every conceivable way, to the uncaring institution" (Adams and Chivers, 2021).

While dementia villages inscribe themselves in a *social turn* in care, these new models are not without important criticisms (Dolan, 2010; Cribb, 2000). Most criticisms emphasize the problematic 'normalization' of lying and deception, for some people, and how such facilities are inherently infantilizing and patronizing for the elderly, therefore negative (Steele et al., 2020b; Steele et al., 2020a). The social construction of the older person with cognitive decline, as no longer reachable, *lost* in the person, serves as justification for playfulness from family members and carers and a sense of 'deresponsibilization' with regards to truly getting to know the new person. Futhermore, despite dementia villages being described as utopian settings where residents

wander happily in innocent reminiscences, these settings raise questions in terms of the human rights infringement of most dementia care facilities that promote the isolation and perpetuate the containment of people with dementia. Adams and Chivers note that, "the dementia village is a walled, gated community, not unlike a prison in its site plan" (Adams and Chivers, 2021). Residents in dementia villages remain removed from and even prevented from contact with the rest of society; they cannot access other communities. This increases the likelihood of abuse and neglect behind closed doors. How dementia villages replicate these aspects of standard geriatric facilities is largely absent from the mainstream narratives about these new and promising designs. The question regarding the residents' capacity to be part of the larger community, of society, remains brushed off.

The central role of deception in dementia villages is frequently justified through the invocation of beneficence. A news article describing De Hogeweyk notes that the "residents … require fewer medications, eat better, live longer, and appear more joyful than those in standard elderly-care facilities" (Tinker, 2013)[9]. This aligns with justifications that practitioners offer when asked about the role of lying in dementia care. As one therapist put it, "that's why we have to tell a lot of lies. Because it's for their benefit" (Tuckett, 2012: 13). In line with this, draft guidelines developed for the practice of lying in dementia care list as the first guideline "Lies should only be told if they are in the best interest of the resident, e.g. to ease distress" (James et al., 2006: 800)[10]. But who is most likely to benefit from a dementia village, and therefore sought and selected to become residents? These villages harken back to a time that may be remembered much more fondly by some than others. In De Hogewyck, residents can choose rooms decorated according to seven archetypes, said to reflect the Dutch population: Homey ("a simple life, focus on housekeeping and family"); Christian ("religion is an important part of life, may affect lifestyle choices"); Craftsman ("traditional, hardworking, early to rise/early to bed"); Arts and culture ("international travelers, colorful interior design, more adventurous in food choices"); Aristocracy ("formal, classic design,

accustomed to having servants"); Indonesian/ Colonial ("interested in nature, spirituality, Indonesian food"); and Urban ("outgoing, informal") (Glass, 2014: 77)

These themes/archetypes raise questions regarding the cultural biases and social norms that can be reproduced and reinforced, including those fostering social discrimination. Favouring the 'familial past' is presented as comforting, non-confrontational, validating, but it raises the question of who are the ideal residents and how racism, sexism, homophobia, etc., can be naturalized. "You're allowed to live in the mental and physical space that makes you the most comfortable", says one author describing dementia villages (Rogers, 2018). For whom is this replicated time most comfortable with for, is the question we are left with[11].

Provocative Testing

Discussions of the ethics of provocative testing, given the trickery involved and the importance of trust and autonomy in medicine, are common. As above, the importance of weighing risks and benefits dominates these discussions. As Takasaki and colleagues ask, does the "harm of subterfuge outweigh the good that comes from an expedited diagnosis?" (Takasaki et al., 2016: 7). Many discussions point to the costs of not using deceptive testing for diagnosis. Diagnosing PNES through other means, we are told, is lengthy, resource-intensive, and demanding on both patients and practitioners. Seizures often occur infrequently, and are therefore difficult to document, record, and examine. Equipment for EEG testing is not usually at hand and easy to hook up in time. By contrast, the deceptive saline test is viewed as rapid, relatively safe, and relatively effective. Because the treatment is 'merely a nocebo', the physical risks are thought to be minimal; and after the test is finished, there seems to be no doubt that a seizure or other negative effects will cease automatically once the injection is stopped.

Most importantly, having a definitive diagnosis, and sooner rather than later, is viewed as primordial. Selim Benbadis argues that it is *unequivocally more unethical* to leave a patient without a diagnosis or with a wrong one for these could have dire medical consequences (e.g. fatality)

(Benbadis, 2009). Deception is unequivocally justifiable because 'life', the ultimate principle, is threatened. Yet how this argument is made can itself be likened to misdirection. The reader is led to weigh the *wrongness* of receiving a wrong diagnosis, but directed away from the harms of deceptive diagnoses or alternative options. Such a discussion misdirects the reader away from the fact that provocative testing is neither necessary nor the sole option (Bernat, 2010). Critics of provocative testing point to the harms that can be caused to the patient-physician relationship through the deception involved, especially given common histories of abuse and challenges related to establishing trust in patients diagnosed with PNES. Burack and colleagues also point to the "anger and humiliation" often felt by patients with PNES after discovering that they have been deceived by their provider, and how in some cases, these patients do not return for further care (Burack et al., 1997). Benbadis, however, dismisses ethical concerns about provocative testing as outweighed by the importance of beneficence and nonmalfeasance, misdirecting the reader and perpetuating the story that there are instances where this test is the only option – *without it*, a wrongful and *harmful* diagnosis is likely to follow (Benbadis, 2009).

Stories that matter

Above, we've shed light on how each of these cases are tellings, stories that come with particular frames and not others, that enact selective views, orient and misdirect audience members – controlling the 'story'. Elements of the story, including who the (direct or distant) audience is, what the trick consists of, who the magician(s) might be, and what the outcomes will be, are carefully thought out, crafted, and controlled by those in positions of authority and power, at the costs of the voices of audience members – children, aging adults with cognitive issues, females with a history of abuse and suspected of deception. Yet stories matter, in more than one way. Stories have material effects in addition to discursive ones. These material effects include unforeseen effects such as, in the case of the children experiencing the placebo machine, taking full responsibility for the absence of positive outcomes and their 'defective brain' which is unable to heal itself; in the case

of adults with dementia, failing to engage (with) them as whole *and new* people, who have desires, goals, fears, etc.; in the case of women suspected of faking it, jeopardizing their ability to form therapeutic and trusting bonds with others, including health professionals.

In this section, working with the contributions of F/STS and Feminist New Materialism (FNM), we explore the underlying and unavowed assumptions in the medical narratives that sustain each of our medical cases, paying particular attention to the entanglement of the material and the discursive in how these stories are told, framed, and enacted.

What of reality?

Here, we consider: in these stories of beneficent deception, what are the unquestioned assumptions about the real, about reality? And how are these assumptions produced and reproduced, perhaps enforced, through both the prospective (hopes) and retrospective (attributed outcomes and causal links) tellings of these stories? We ask: is this *really how* the world is? And if this isn't *really* the way the world is -- who, if anyone, takes responsibility for these assumptions about (and their effects on) the real and causation?

In magic and Western medicine, it is assumed that there is one reality, which is fixed, immutable, stable. Magic is a trick, an illusion, which manipulates known physical features of the world, of a world that is deemed 'known'. Medicine does the same, working its miracles through manipulations of the patterns, structures, and components of the body. Underlying these tricks is the unfaltering assumption that there is *a* real, a real that is *really real* – that is, fixed and known/knowable using the scientific method. In medicine, one seeks to know this reality completely, and harness it for the benefit of patients. In magic, playfulness and enchantment offer a temporary 'escape' from a 'disenchanted' (a.k.a. scientific/known) world. One 'pretends' its unfaltering physical laws can be bent, for the fun of it, but all the while continuing to hold that tricks exist only 'all in the heads' of audience members, brought about through the magician's clever manipulations. All the while, the real remains unchanged.

Yet is it 'truly' the case? Perhaps not. F/STS and FNM highlight how the Western traditions of science and philosophy have long operated under an ontological assumption, that the world is fixed and that things (e.g. matter), conceived as endowed with essences that transcend time and space, can be known (i.e. 'discovered') using an appropriate method, i.e. the scientific method (Alaimo and Hekman, 2008; Barad, 2007). These scholars push against these assumptions; working with novel developments in the 'hard' sciences (e.g. chemistry, physics, biology, geology), they show that reality is not endowed with a fixed ontology, but rather is ontologically open, indeterminate.

In her work, Karen Barad uses the work of quantum physicist Niels Bohr to show how the physical world is not, as we often think, endowed with fixed properties, but is, at the 'core', without any, and rather always *in-the-making*, *indeterminate*, yet *performative,* and becoming, but only in context and relationally (that is, with other things, *bound* to these other 'emerging things', which include both material and discursive things) (Barad, 2007; Barad, 1996). Bohr argues that *measurement* in science is what contributes to the *configuration* of material matter. Measurement influences matter-as-indeterminate to solidify/stabilize itself, thus becoming available to scientific observations, that is, *representationable.* This is evident in the case of the famous particle-wave experiment, where light, depending of the apparatus used to observe it, will either display *particle* or *wave-like* behavior, two facets that are traditionally conceived as irremediable and incompatible (for more, see Barad, 2007).

This experiment is famous because it reveals the non-static 'state' of our reality, its inner indeterminacy. Things may acquire something akin to an essence, an identity, but they do so only temporarily, in context, as well as relationally; with other things (other material things or discursive matters); *intra-actively*, too, rather than *inter-actively,* meaning that there are no things that pre-exist relata. Things are co-constituted: they become together-apart, always linked, and such links are essential to any investigation that aims to acquire knowledge. So it is, too, in stories of beneficent deception in medicine. Placebo effects

cannot occur outside of relationships. There is no inherent power in a sugar pill; rather its meaning is derived from an assemblage of actors, factors, and constructed meanings. In provocative testing, a diagnostic trick is said to reveal the etiology of a seizure, but each seizure produced in such a setting was created not merely 'in the head' of the patient, but also a result of a coordinated performance involving medical tools, suggestions, and moral framings. In dementia villages, no absolute reality exists, but temporary ones are enacted through relationships between residents, carers, and family members, all partaking in a process of creation within a suggestive environment. As Shannon Mattern recently suggested in a discussion of dementia, "Perhaps we need to move away from this sort of binary logic of recognition and reality, which tends to focus on fixed identities and reciprocal relations. Perhaps we might instead consider spaces of containment, like the closet — or even the dementia village — as sites of creation, transformation, and mediation; as incubators of epiphanies, dreams, fears, memories, new relations, new worlds" (Mattern, 2021).

What of causation?

Medical knowledge, much like the Western traditions of scientific knowledge, is known to approach events in the mechanic conception of causation. In this model, the reductionist approach is used to simplify the world, to attribute power to discrete things, and determine causes and effects, simply. Like F/STS, placebo research disrupts medicine's longstanding causal lines between causes and cures. A pill is no longer merely a pill, but a pill embedded with meaning and history, which cannot be left out of the causal picture (Berkhout and Jaarsma, 2018; Moerman, 2002). Aspects of the clinical encounter that are ordinarily thought of as 'the art of medicine' begin to make their way in the causal story of what constitutes healing. In this way, it becomes clear that in realms where the placebo operates, a cure is never just a cure, but is imbued with its power in part through placebo pathways that have been activated through various means. While credit for the clever experiment belongs with the research team, the children are repeatedly told that they are responsible for their own healing, as their

brains learn to heal themselves throughout the experiment. While such a narrative may be helpful to these children, it cannot be said that the brain is the sole agent of healing in this story. Things are more complex and always relational, as F/STS scholars and those versed in the *new/immanent ontologies* point out[12]. This is reminiscent of Elizabeth Wilson's analysis of the endless quest to disentangle placebo responders and anti-depressant responders. As Wilson points out, there is no clean break between these, because "the response to the medication and the response to placebo are parasitic on each other" (Wilson, 2015: 132).

In the placebo machine, the notion of a singular cure no longer makes sense. Instead, we must look to an assemblage of contributors – the patient, the treatment, the environment, the healer – among other things and dynamics and the way each of these elements are related, in order to understand what has taken place. The placebo machine distributes causality in various directions – towards celebrity endorsements, social proof, institutional credibility, a large team and camera crew, lab coats, high-tech equipment, cognitive reframing, positive suggestions, a peer mentor, and space music. As such, the singular cause of the cure, a central assumption in evidence-based medicine, on which the randomized-control trial is founded, is lost. But why is it *this conception* of causality that dominates our thinking? Is this really 'how all things work', that is, that things can be dissociated, separately neatly, kept at bay, and simplified, while a single cause-to-effect is established?

In her work of rethinking realism and ontology with the concept of agential matter, Barad (2007) shows that once you have shown that things do not have essences or identities pre-existing their relata, it becomes harder to attribute clear causal lines between things. Indeed, where does one thing stop and the next one begin?

> Causality is most often figured as a relation between distinct entities. … But according to agential realism, separately determinate entities do not pre-exist their intra-action. So how are we to think about causality in this account? … On an agential realist account, causal relations cannot be thought of as specific relations between isolated objects; rather [they] necessarily entail a

specification of the material apparatus that enacts an agential cut between determinately bounded and propertied entities within a phenomenon (Barad, 2007: 175-176)

In Barad's view of *intra-action*, 'causality' refers to the process of separating that which was not separated in the first place, but there is nothing that comes first; rather, we only have a 'becoming apart-together'. This is also why Barad moves away from concepts such as 'nature' versus 'culture' or 'subjects' and 'objects' in knowledge inquiries. She proposes instead those of *agencies of observation* and *objects of observation*, whereby 'observation' clarifies that the moment of stability that enables knowledge claims is a made-situation of *interiority* where stability has been achieved and 'identities' can be respectively attributed. But their 'identities' are intricately and irrevocably linked; they cannot be dealt with or known independently from one another. What they 'are' is true only when one considers their relations (Barad, 2007).

Assumptions of causation are also deeply embedded in the practice of provocative testing. These tests rest on a dichotomous premise of one, legitimate, bodily cause (epilepsy) that can underlie seizures, versus another, illegitimate psychological cause that can also lead to seizures. Of course, this set up presumes the highly unlikely dualism between mind and body that Western medicine rests upon. What's more, one cause does not rule out another cause. What is rarely mentioned in ethical discussions of provocative testing is the uncertain efficacy of the test. Because patients who have PNES can also have epilepsy, the deceptive test could prove nothing; it may indicate that the patient has PNES but can not in fact rule out epilepsy.

Furthermore, it is worth asking what causation is really contributing in provocative testing. If the patient fails the doctor's trick and is determined to have non-epileptic seizures, one hypothetical ('psychogenic') cause replaces another ('epileptic'), but provides no additional explanatory information. This is reminiscent of Isabelle Stengers' discussion of the commission appointed to investigate Anton Mesmer in the 18th century and his claim that he could heal patients through his mysterious magnetic fluid. Using the trickery of blinding now commonly used in randomized

control trials, the commission concluded that Mesmer was a charlatan, and that what explained the relief felt by his patients wasn't the fluid, but the imagination. But, as Stengers points out, the imagination is just as mysterious as Mesmer's magnetic fluid. Just as with psychogenic seizures replacing epileptic ones, reframing causation can be "just a way of disqualifying the phenomenon rather than understanding it" (Stengers, 2013: 22).

In science and medicine, causal stories are often sanitized to exclude the places in which ignorance or accident co-exist, despite these being central parts of their construction. Consider Barad's discussion of an unseen causal contributor in the Stern-Gerlach experiment from quantum physics 'First, an explanation of the experiment':

In the original experiment, silver atoms were sent through a spatially varying magnetic field, which deflected them before they struck a detector screen, such as a glass slide. Particles with non-zero magnetic moment are deflected, due to the magnetic field gradient, from a straight path. The screen reveals discrete points of accumulation, rather than a continuous distribution, owing to their quantized spin. Historically, this experiment was decisive in convincing physicists of the reality of angular-momentum quantization in all atomic-scale systems. (Franklin and Perovic, 1998; Gerlach and Stern, 1922; Friedrich and Herschbach, 2003 cited in Wikipedia, 2021)

It took many tries however to successfully achieve this observation as Barad reports (2007). Stern, a leading scientist in the domain, was key to this. Before a particular involvement on his part in the experiment, leading scientists in the world were abandoning this experiment and hypothesis all together. In Barad's words:

Stern held the plates in his hands and studied them at a distance close enough so that the plates could absorb the fumes of Stern's sulfuric breath, turning the faint, nearly invisible, silver traces into jet black silver sulfide traces (Barad, 2007: 165)

Stern, you see, used to smoke a specific brand of cheap cigars. The composition of this type of cigar is decisive, allowing him and his fellow scientists to make the observation reported above – and the contribution we now know to science and quantum physics:

The reproducibility of the experiment depends on the cigar's presence. Not any old cigar will do: the high sulfur content of a cheap cigar is crucial. Class, nationalism, gender, and the politics of nationalism, among other variables, are all part of this apparatus (which is not to say that all relevant factors figure in the same way or with the same weight) (Barad, 2007: 165)

Here Barad explains why Stern smoked this cigar, and not another kind, and how this decision depends intimately on his embodiment, gender, nationality and nationalism, economic class. All these facets came to play a decisive causal role in the production of *this* knowledge, and are vital to its reproducibility. How, then, can each 'magician' in the above cases hold complete knowledge of the causal effects of their experiences?

All stories are made… but not 'made up'

These assumptions, about reality, about causation, including their fixed, inert, and 'discoverable' natures, are thus questionable. The main problem – or rather the main consequence – regarding these assumptions is that it fosters the creation and maintenance of *blind-spots* and *gaps in accountability* for the notably active role that those involved in scientific and medical practices play. This lack of accountability for those in positions of authority in each case is further witnessed when one examines how little attention they pay to the active role they play in *making* the stories, the narratives. This goes for the medical scientists as well as practitioners that rely on deception. That is, in creating the 'reality' that they so-direly assumed to be 'true', that is, *fixed,* immutable. But all stories are created, made. To create a story, one has to make choices, to leave some things out, to insist on others. It is always a framing. By adopting one story of 'truth', these practices perpetuate the invisibility of other mechanisms that could be at stake, that could be taking place. Some stories are made visible, while others fade into the background.

In dementia villages, a particularly enlightening example of how 'stories are made', a past is imagined, which is based on a particular time and perspective and further enacted (i.e. reproduced concretely in the context of the care facilities). Those designing such settings must decide, in crafting this renewed past: For whom is this past (re)made? The residents, or for carers and family members? Whose voices are involved, sought? What is removed from the past/story, and how? How is it curated, purified [13], for the residents (e.g. cleansed of sexism and racism)? How much do the makers/creators: deal with the reshaping of the past?; convince themselves that they are not makers/creators, but simplifying (and successfully) copying a past that would exist as fixed?; reckon with the unforeseeable consequences and construction of the past?[14] Such decisions are made throughout the construction of any story, any magical enactment within medicine. Our tendency to erase authorship, the role of those telling the stories, is a worrisome one.

Coda: Embracing magic in medicine?

Medicine is magic/al. Yet what if this 'fact' was acknowledged and embraced by practitioners and researchers alike? There are so many things we do not know about medicine: how knowledge is constructed, how treatments work, which treatments works, and so forth. This recognition, however, continues to be ignored, denied, brushed off. Why?

Unsurprisingly, in a scientific paradigm that remains highly positivist, realist, and reductionist, that adopts representationalism as its main approach to knowing and that aims to put into clear, mutually exclusively, discrete boxes of 'thingified things' (Barad, 2007; Barad, 1996), an acknowledgement of the absence and impossibility of *complete* knowledge, and of clear and direct cause-to-effect relations, appears impossible. In biomedicine, where objective expertise is held as a necessary condition for authority and effectiveness, how could ambiguity and indeterminacy be embraced?

While magic tricks take place in a world in which reality is known and manipulated, another form of magic, that which is unexplainable and mystifying, leads us to experience wonder in light of our own epistemic limitations. Is there space for such wonder in medicine? Of course, purposefully and intentionally *infusing* magic into medical (and bioethical) practices should be done with careful care, and respect, as well as trust. Feminist New Materialism speaks of knowledge endeavours in

light of their new dynamic ontology as needing to embrace and practise an *ethic of response-ability*, which is a caring, future-oriented, responsible and responsive *ethico-onto-epistemological* practice, one that recognizes *and embraces* the inseparability of ethical, ontological, and epistemological considerations and the inherent dynamism and indeterminacy of our reality:

> [M]any feminist engagements with the diagnosis of the Anthropocene focus on a re-conceptualization of the notion of responsibility as *ability to respond* or *response-ability*: Haraway works with this notion in her discussion of human-dog-relationships, examining the development of an ethos of curiosity and a practice of responding with otherness (Haraway 2008, 19–27; Haraway 2003); Karen Barad (2007, 391–396) pleads for an 'ethics of entanglement' (Barad 2012, 47) that acknowledges the inherent ethical dimension of all worlding;… by emphasizing constitutive impurity. Alexis Shotwell (2016, 48–54) shows that a practice of responding in these troubled times cannot refer to an idea of purity, but has to push forward a decolonizing memory practice. All of these approaches share the idea that there is a need to go beyond individualizing notions of responsibility in addressing the multiple, never fully graspable interdependencies of the present condition. The notion of response is therefore key for a post-anthropocentric feminist ethics. (Hoppe, 2020: 126, citations in original)

In 'troubled times' full of complexity and entanglements (Haraway, 2016), we need to embrace magic in a way that brings out our *capacity* to respond, and that of those working in medical research and practice; mere beneficent deception will not do. Ian Hacking warns that knowledge practices tend to dismiss mysterious and marvellous phenomena. He notes that "one way to silence a topic of research is to treat it as a curiosity or turn it into a marvel. Science abhors a marvel, not because marvels are vacuous, empty of meaning, but because they are too full of meaning, of hints, of feeling" (Hacking, 1998). But what would it look like to turn towards marvels, towards that which is magical in medicine?

Isn't there something mysterious, perhaps magical, in the way our brains produce seizures as a result of our trauma? Why dismiss this remark-able event through a deceptive test and a referral to a psychiatrist? Something fascinating and challenging is often taking place in the stories that resist, that push against our boundaries and boxes. In medicine, the boundary between the mind and the body is one of the most firmly established. Nonepileptic, pseudo seizures, or *spells*, collapse this line, refusing to exist on one side or the other. While patients who experience such seizures are tossed back and forth between neurology and psychiatry, never quite belonging, they are also challenging a fundamental assumption, of *reality*, built into medical practice. By transforming their trauma, their pain, into a physical experience, these patients are performing a remarkable magic trick, one that we cannot understand. But rather than eliciting our wonder, our compassion, and our curiosity, we suspect them, we deceive them, and we dismiss them from the places where they seek help.

What of dementia villages? These villages don't only offer a form of validation for those living with dementia, but a fictional place for all of us. Can they offer a bridge between the often disparite experiences, and mental worlds, of those living with and without dementia? There is a magic in how we are shaped, directly and constantly, by our environments, and dementia villages may provide an avenue by which we can come to appreciate this constant influence, and better understand that there is no single reality, some exist in and others don't. And now may be a better time than ever to reach for this understanding. As Mattern points out, "The epistemological crises of recent years — conspiracy theories, political factionalism — demonstrate just how tenuous is the concept of a "shared reality" against which a demented ontology might be measured" (Mattern, 2021).

The placebo machine is also a good example of medical practice that embraces the principles of magic. In leaning in to a fantastical magic show set up by researchers, these children have found ways to heal, not merely by healing themselves, but through a complex causal picture involving their brains and beliefs, the relationships they are embedded in, their histories, and an extraordinary environment. In this experiment, the limited knowledge of biomedicine and traditional Western knowledge practices is recog-

nized – and accepted; the experiment proposes a *situation,* inhabited with various practices and objects, discourses, dreams, values, from which a magical response can happen, that of healing. Where and how the healing happens is not clear. But something *does happen,* and novel forms of healing are explored, even celebrated.

William James was interested in the question of when it is reasonable to believe something in the face of uncertainty. He suggested that there are some cases in which "faith creates its own verification", and in these instances, we might find "the will to believe", despite uncertainty (James, 1897: 97). In such cases, he argued, belief is the only way to access particular outcomes, even though belief may not be justified on epistemic grounds. Where in medicine might we invite belief in the face of uncertainty, unknowing, or ignorance? The placebo machine is one such story. In this experience, belief, despite uncertainty, may be part of the causal storm that contributes to relief in these children. This, it seems, is a magic worth embracing. But we must be careful not to limit our attention only to those children who play along.

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Notes

1   The 'ontological turn' refers to a paradigmal shift in the sciences and humanities, where the immutability, endurance and fixity of the *ontic*, the physical reality, is questioned, and *ontology*, the inquiry into the matter of things, no longer viewed as a practice that leaves unaffected what it studies. For more on this, see (Pickering, 2017).

2   Reliance on 'magic terminology' has a long tradition in Western Science. Sociologists such Max Weber and feminist sociologists/science scholars such as Carolyn Merchant, Donna Haraway, and Sandra Harding, document how Western sciences have been framed and have framed themselves as 'demystifying' nature, 'disenchanting it', whereby 'enchantment' is depicted as a veil, a lure, a fog that prevents people from seeing how the world truly is (Weber, 1946; Harding, 1986; Haraway, 2013). Silvia Federici, Isabelle Stengers and Vinciane Despret also rely on the figuration of the witch in their writings (Federici, 2004; Stengers and Despret, 2015). What many feminists working in F/STS or Feminist New Materialisms (FNM) are, instead, doing is showing how there may be more 'magic at play' in scientific endeavors, i.e. things that we do not comprehend, that spark wonder, etc., and how 'knowledge' can emerge from allowing oneself to be available and to entice such 'affective effects'. See, for example, Jane Bennett's work on vital materialism, the thing-power, and her book on the re-enchantment of the world (Bennett, 2010; Bennett, 2006); Natasha Myers' work on scientists and how they use their bodies during the intra-action at play in scientific endeavours, as well as her new methodology mobilizing affects, plants, intra-action, and Darwin's work (Myers, 2015a; Myers, 2015b; Hustak and Myers, 2012; Myers and Dumit, 2011).

3   While this case involves the use of a saline injection to induce a seizure, provocative testing uses a variety of methods to do so (e.g. body part compression, verbal suggestion, placement of a tuning fork or moistened patches onto the skin, hypnosis) (Devinsky et al., 2011).

4   Adams and Chivers suggest that the "nostalgic design" of dementia villages acts like "an architectural analgesic", soothing and numbing "the pain of family members who may be uncomfortable deceiving their ailing relatives" (Adams and Chivers, 2021).

5   This isn't to deny, of course, how morally and emotionally challenging it is for family members and health professionals to support people living with dementia in processes of shared-decision making, but merely to observe the way in which ethical discussions of dementia villages focus on family members, not residents, as the key characters in the story. For studies pertaining to the exploration or use of alternative approaches and understandings of personhood, when living with cognitive decline or dementia, see (Almqvist and Andersson, 2019; Bartlett and O'Connor, 2010; Kenning et al., 2021; Leibing and Cohen, 2006; Lynn et al., 2019).

6   *Partial knowledges* is the concept proposed by Haraway to make clear that any knowledge emerges and is linked to a "situation", a situated, material, discursive, and necessarily *perspectival*/partial; context for the emergence and configuration of any knowledge is needed (Haraway and Goodeve, 2018).

7   See also Bruno Latour on 'matters of fact' as truly 'matters of concern' (Latour, 2004), a conception of science that Maria Puig de la Bellacasa pushes even further in speaking of scientific objects as 'matters of care' (de La Bellacasa, 2011).

8   Olson makes this argument more explicitly in other work (Olson and Raz, 2021).

9   Although a report by the Canadian Agency for Drugs and Technologies in Health (CADTH) found that there's currently "not enough evidence to confidently say whether dementia villages improve quality of life for residents" ((Wallington, n.d.) in discussion of (Canadian Agency for Drugs and Technologies in Health, 2019)).

10 Interestingly, the guidelines were developed on the basis of the views of staff only; the perspectives of those living with dementia were not taken into account.

11 See (Wekker, 2016) for an examination of how Dutch Imperialism continues to play a fundamental role in shaping dominant culture in the Netherlands, particularly through the notion of white innocence, which grounds the Dutch self-portrait.

12 For more on the concept of an *immanent ontology,* see (Cruickshank, 2004; Coole and Frost, 2010).

13 We use the term 'purified' in reference to how Bruno Latour and his colleagues who use the term (Latour, 2012; Latour, 1987; Lien and Law, 2011; Law and Lien, 2013; Pickering, 2009).

14 Haraway and other STS/FNM scholars insist that saying that knowledge is made (and through the feature of 'storying'/story-telling) does not mean that 1) things are *made up* (fictions); 2) that all stories of the real are equal (of equal value). There are, of course, some stories that are more accurate than others (Haraway and Goodeve, 2018; Haraway, 2015; Haraway, 2016; Barad, 1996; Barad, 2007).

Encountering Semiotic Misdirection in Covid-19 Etiquette Guides

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Abstract

This paper examines Global health misdirection unfolding at the semiotic level of Covid-19 related texts and images produced by the World Health Organisation. I argue that such public health materials, claiming neutrality and universal applicability, become multimodal etiquette guides that presume normal bodies and middle-class social environments. I give specific attention to how Covid-19-related materialities, affordances and emotive actants directly contribute to elite-making, stratification and strategic cultivation of shame and embarrassment with regard to Covid-19 etiquette. By tracing such an example of 'semiotic misdirection' in global health, I invite STS and adjacent communities to approach the circulation of public health materials as a semiotic practice that creates novel kinds of oddities and stratifications, and to consider the enactment of seemingly neutral and value-free public health rules as morally-charged etiquette.

Keywords: Covid, misdirection, etiquette, manners, affordances

Introduction

Since the beginning of the Covid crisis in 2019, the cultivation of safe and responsible behaviour has quickly become one of the key public health techniques for limiting viral transmission. On March 11, the WHO (2020) released the recommendation that

> social distancing and quarantine measures need to be implemented in a timely and thorough manner. Some of the measures that countries may consider adopting are: closures of schools and universities, implementation of remote working policies, minimizing the use of public transport in peak hours and deferment of nonessential travel.

Insofar as common 'dos and don'ts' — wash hands, wear masks, maintain distance— began to be incarnated in peoples' actions and attitudes they inevitably started activating new and puzzling kinds of etiquette (local rules of social acceptance and efficiency of interactions) and manners (forms of polite communication) in real-world contexts. For instance, in the first months of the pandemic, various elite newspapers and blogs began to recommend avoiding cash transactions, parties and social gatherings, keeping masks off the table, generously tipping delivery drivers, actively using knuckles for touching potentially contaminated surfaces and elbows for greetings instead

of palms and fingertips, as well as avoiding spitting, exercising outside and throwing away personal hygiene items. Clear and enunciated speech has been highlighted as an essential feature of effective communication while wearing masks, and eyebrows were suggested as mediators of emotional expressions (Woodend, 2020). Proper and improper facial hairstyles are discussed with regard to masks and respirators (Baker et al., 2020; CDC, 2020). Colour-coded wristbands—typically green, yellow and red—were suggested to signify the wearers' level of acceptable social distancing and preferred greeting practices (Baik, 2021; Levitz, 2021). Remarkably, this means that the WHO's statement (2020) on a "timely and thorough manner" of interventions has actually resulted in novel etiquette and manners tailored for nearly every imaginable social activity, bringing up a "tacit 'choreography' of everyday life" (Chao, 2020) in using everyday surfaces and infrastructures.

In this discussion paper, I employ semiotic reading Covid-19 etiquette rules and guides produced by the World Health Organization (WHO), that are meant to be used by everyone in the world, according to the official position of the organization. In doing so, I visualize the elite-making and stratifying dimensions of Covid-19 etiquette. Reflecting on STS notions of affordances and materialities, I argue that Covid-19 etiquette rules and guides produce misdirection at the semiotic level, signifying compliance as a matter of individual choice, and drawing attention away from chronic social issues and inequalities that are very present worldwide. By encountering such 'semiotic misdirection', I argue that distribution and circulation of public texts and images could be understood as a persuasive semiotic practice activating cascades of what Stark (2019) calls 'emotive actants', leading to a spectrum of moral and emotional manifestations in ordinary sociomaterial contexts. I invite STS scholars and adjacent academic communities to look for other signs of semiotic misdirection in the shared goal of disturbing a sustained imagination of global health as neutral and value-free practices.

Etiquette beyond casual romanticism

Before analysing Covid-19 etiquette it might be a good idea to start with a definition of etiquette. According to the Merriam-Webster dictionary (2022), the term could be defined as "the rules indicating the proper and polite way to behave". In this definition of etiquette, the emphasis is placed on individual behaviours and rules that a person should follow. However, this definition is reductionist; it does not talk about social emotions as by-products of etiquette, and the fact, that etiquette if often a sign of divided environments.

Against this simplistic definition, series of sociological and anthropological works give etiquette a grim and problematic twist. For instance, according to sociology of manners pioneered by the German sociologist Elias, etiquette emerged in stratified societies around the globe, serving as a social technique for recognition and acceptance, that was directly linked to the social formation of elites and simultaneous cultivation of shame and embarrassment in targets deemed inferior (Coleman, 2013; Elias, 2000; Wouters, 2004). Etiquette, therefore, played a pivotal role in the formation and signification of social class, in which shame and disparagement were attached to the trope of a 'dirty, poor peasant', and, later to the 'worker'—as opposed to the refined and elegant behaviours attributed to the upper and middle-classes, whose gestures, food habits, accents and use of material objects were deemed superior. As the French sociologist Bourdieu (1986) summarised in the concept of 'habitus', such patterns allowed the maintenance of the status quo as the everyday signification of social difference was expanding in all directions through social institutions and upbringing. In a similar manner, etiquette directly contributed to essentialising gender and sexuality in social realities, primarily through numerous etiquette guides for ladies and gentlemen. Such guides casually constructed 'proper' women as sentimental, submissive, vulnerable and close to nature (Grosz, 1994), as opposed to cultured men, practicing gentlemanly masculinity (Pelden et al., 2019; Plumwood, 1993).

In continuing to disrupt the casual imagination of etiquette as something innocent and simple,

it is essential to mention that etiquette travelled with colonialism, framing sets of behaviours of whites as superior to that of the colonized and enslaved people, who had to behave according to a strict set of enforced rules to be judged as 'proper' (McClintock, 1995). For instance, in Southern Rhodesia (modern-day Zimbabwe), racial etiquette included "deferring to whites, sitting on the floor of offices, coming when called, making way for whites on sidewalks, and appearing cheerful in the face of whites' demands for their time, labor, and approval" (Shutt, 2015: 51). In the USA, racial etiquette directly complemented the segregationist laws that "blacks must demonstrate their inferiority to whites by actions, words, and manners" (Davis, 2006).

Such instances cumulatively suggest that etiquette should be interpreted as a power practice embedded in continuums of inequalities, and that, by extension, Covid-19 etiquette is neither an innocent nor a romantic phenomenon, whose stratifying and elite-making dimensions should be unpacked.

A touch of magic: Rendering the proper body and world through simple rules

Etiquette and manners are directly connected to the sociomaterial world. However, the socio-material aspects of etiquette commonly remain implied behind the rules and norms, hinting at various 'affordances' (Davis and Chouinard, 2016; Hutchby, 2001) as ways in which systems and structures allow and restrict possibilities for certain behaviours. This vividly connects etiquette with the notion of body techniques as to how people "know how to use their bodies" in given contexts (Mauss, 1973: 70), and how bodies are manipulated through various practices of governance (Mol, 2003).

To illustrate affordances and sociomaterial features that are hidden in etiquette guides, let me refer to an example of Western table etiquette. To comply with this etiquette, a certain assemblage is needed: a table itself, chairs, cutlery, labour to put everything into its proper order, and food to be prepared and served. A person would be assumed to use two hands, in order to simul-

taneously hold a knife and a fork. Each of those elements in itself is a product of a sophisticated sociomaterial and bodily performance that is evident from investigations of material semiotics (Abrahamsson et al., 2015). The presence of cutlery on a table, for instance, is connected to several jointly connected processes: geological genesis of ore, systems of extraction of ore, the work of a blast furnace and casting to turn metal into the cutlery, adjoined with the industrial production and labour, and systems of produce distribution, as well as the purchasing power to obtain the given items. This backstage for etiquette is implied rather than spelled out. Each of those elements is an assemblage in itself that can be further traced as a network of events, raising a timely question for material semiotics: "When is it time to stop tracing those webs?" (Law, 2019: 4) Or, to provide another example: e-mail etiquette. It implies the presence of the internet, electricity, a mobile device or computer with the peripherals, an ability to input characters and perceive them, and other artefacts and actants of a sociomaterial network. In order to adequately implement etiquette and manners, all those elements of given infrastructures are supposed to be in place, allowing proper behaviours and certain possibilities of interaction to happen.

Tracking similar kinds of affordances and body embodiments with regard to Covid-19 etiquette and manners hints at a perplexing co-production. On the one hand, Covid-19 etiquette and manners help save countless lives by cultivating responsible public health behaviours. On the other hand, short and official statements presume the existence of those features of the body and sociomaterial settings needed to practice Covid-19 etiquette and manners. Following the idea that different practices with regard to Covid-19 render a multiplicity of ontological realities (Ashraf and Mol, 2020; Mol and Hardon, 2020), each of the rules could therefore be 'unpacked' to inquire into the implied bodily experiences and socioeconomic aspects needed to afford good Covid-19 etiquette.

Take, for instance, the core Covid-19 rules, actively pushed by the WHO:
- Wash hands with soap or alcohol scrub
- Wear masks

- Maintain at least a 1-metre distance between yourself and others
- Avoid crowded spaces and people who are sick
- Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze
- Avoid touching your eyes, nose and mouth.
- Self-isolate when sick

Here, bodies are characterized by a goal-oriented behaviour and performativity. First of all, it is implied that people have functional elbows to sneeze into, and healthy hands to wash. This etiquette rule is not achievable for many people: In 2017, 57.7 million people were living with limb amputation due to traumatic causes worldwide (McDonald et al., 2020). A rule to avoid touching eyes, nose, or mouth also implies the presence of these body parts as a default setting. To effectively avoid people in social contexts, people need to have functioning organs to gain information about surroundings. Globally, 36 million people are blind (Ackland et al., 2018), and 403 million people require rehabilitation to address hearing loss (Haile et al., 2021). Moreover, it has been suggested that the term 'social distancing' was historically employed to withdraw from addressing systemic inequity and the legacy of violence, as evident from how the term was applied for purposeful stigmatization with regard to race in the USA and class in the UK; more recently it gained prominence in the 1990s with blame-based narratives surrounding HIV positive people (Scherlis, 2020).

In order to wear masks, wash hands with soap, water or alcohol-based hand rub, people need to have access to such items, in terms of both access and purchasing power. Globally, two out of five people don't have access to basic handwashing facilities and therefore cannot easily wash their hands often (UNICEF, 2020). Approximately 10% of the world's population lives on less than US$1.90 a day, 25% live below the US$3.20 line and more than 40%—almost 3.3 billion people—live below the US$5.50 line (Sumner et al., 2020). This means that for more than half of people worldwide such compliance with 'simple' Covid-19 etiquette could be structurally compromised in terms of money alone.

A request to stay at home and self-isolate implies that people are not homeless or not at risk of eviction, that they have space for themselves large enough to be compartmentalized (i.e. the availability of separate rooms). Globally, 1.6 billion people live in inadequate housing conditions, with about 15 million forcefully evicted every year (United Nations, 2020). In the US, the most Covid-affected country as of June 2021, evictions disproportionately affect Black and Hispanic households who have been historically put in disadvantaged positions (Wedeen, 2021), thereby reinforcing the continuum of structural inequalities. Another implied specificity is the lack of income resultant for many if forced to stay at home; numerous precarious workers cannot work remotely due to labour settings, relying on their wage as the sole source of income with minimal, if any, social welfare support. For essential workers, the workplace commonly implies close contact as an unavoidable reality (Marinaccio et al., 2020). However, Covid-19 etiquette strategically cultivates positive social emotions around essential workers, romantically and sentimentally portraying them as self-sacrificing heroes (Vazquez, 2021).

As a result, the simplicity and laconic configuration of Covid-19 rules effectively misdirects attention away from 'real' people and their lifeworlds, and from the essential elements of a sociomaterial network that is needed to practice Covid-19 etiquette. This could be seen as yet another concern raised by medial anthropologists that how Global Health interventions tend to render 'contexts' as something stable and monotonous, wherein multiplicity and cultural specificity are subtly erased (Brives et al., 2016). This kind of misdirection vividly resonates with a concern that protocols—as strict and simple rules of conduct—render a romantic yet false imagination of a shared world in which everyone is connected, and from which the complexity and tensions are effectively screened out (Galloway, 2004). With a touch of protocol magic, the complexity of Covid-19 contexts shrinks into a simplified behavioural singularity where compliance with socially sanctioned 'dos and don'ts' is rendered as a matter of personal initiative in an unbounded and unobstructed space.

Reading 'Universal' Covid-19 etiquette guides

Where is a Covid-19 etiquette guide located? It seems that throughout vast material and digital landscapes, various elements of Covid-19 etiquette are being communicated through a heterogeneous network of signs and symbols: public warnings, street billboards, websites, TV, music, magazines, viral videos, memes, and information bulletins and beyond, together producing new moral meanings for bodies and social spaces. This might lead one to infer that in the context of Covid-19, the classic etiquette guide departs from the conventional medium of a booklet or book that a person might buy and study. Reflecting on this complexity, a conclusion could be made that multiple proliferating digital and printed materials, signs and warnings form intertextual and multimodal etiquette guides whose elements mutually reinforce and rely on each other. One way of theorizing ways in which seemingly neutral and value-free public health texts and images become morally charged etiquette guides, is to relate to the idea of 'emotive actants', defined by Stark as:

> the actants intensifying the experience and expression of human feelings, and [which] have an increasingly palpable influence within the contours of digitally mediated culture, politics, and social experience (Stark, 2019: 118)

Elaborating on this idea and linking it to the question of governmentality, Halwany and Bencze noted that emotive actants become especially prominent when emotions "are intentionally recruited to produce some sort of social/behavioural change" (Halwany and Bencze, 2022: 26). Emotive actants, therefore, highlight the interconnectedness between social, material and moral-emotional worlds, the interconnectedness that tends to escape from the formalized public health scope. This in turn means that signs of emotive actants as sociomaterial and emotional phenomena could be traced in intertextual Covid-19 etiquette guides, and for such an exercise it might be useful to relate to semiotic studies of advertisements and popular visual representa-

tions. First and foremost, images targeting wide and diverse audiences are fundamentally ideological and influencing practices: they dissolve implicit and explicit normativity in 'casual' texts and images, especially with regard to social class, race and gender (Callier, 2014; Correa, 2009; McIlwain, 2007). Semioticians draw attention to the fact that numerous everyday text-visual elements contain tightly coded values of neoliberalism as the dominant social, economic and cultural vector (Ledin and Machin, 2017; Magdi Fawzy, 2019; Rosen, 2019), including the tropes of 'flexibility', 'proactiveness', 'self-responsibilization', and 'minimalism', which people decode and react to. This semiotic concern resonates with observations of anthropologists studying sociality emotions, suggesting that the international response to Covid-19 accelerated the rapid emotionalization of everyday life:

> emotions are anchored in the concepts and logic of the global therapeutic habitus, the discourse of self-development and self-realisation, and bound up with a neoliberal emotional subjectivity. Cultivating, repairing, and managing the self through the interpretation and management of emotions becomes valued, even moral work, for both individuals and collectives (Lerner and Rivkin-Fish, 2021: 3-4).

By extension, Global Health has been subjected to neoliberal influence. In the 1980s and 1990s neoliberal forces actively deterritorialized national health care systems around the globe, creating spaces and openings that were subsequently reterritorialized as the 'Global Health' that we see today (Sparke, 2020), emphasizing technocratic solutions and targeted and innovative action, alongside the reduction of economic costs and stimulated market competition (Holst, 2020). Significantly, major international actors such as the WHO actively transmit, transform and adapt neoliberal approaches to health and development, resulting in "a more heterogeneous global neoliberal regime" (Chorev, 2013), reflecting a wider process of ever-expanding neoliberal paternalism (Gane, 2021). As such, the WHO was criticized for reenforcing the ideology of the middle and upper classes (Navarro, 2007), declining occupational health support for workers (LaDou, 2020) and

maintaining status quo with regard to the systematic failure of privatized healthcare in managing the pandemic in low-and middle-income countries, including "hospital closures, furloughing of staff, refusals of treatment, and attempts to profit by gouging patients" (Williams, 2020: 181).

Given the magnitude of the pandemic and the international response, it is virtually impossible to analyse all elements of Covid-19 etiquette guides. However, it is possible to look into those images that claim universal applicability, such as those produced by the WHO which, by default, is supposed to speak to the entire world. To quote the WHO's mission statement published on the WHO website:

> We champion health and a better future for all. Dedicated to the well-being of all people and guided by science, the World Health Organization leads and champions global efforts to give everyone, everywhere an equal chance to live a healthy life (WHO, 2021).

According to the Similarweb tracking service, in September 2021 alone the WHO website was visited 53.77M times (Similarweb, 2021). The WHO website, therefore, is a good example of a multimodal etiquette guide that, supposedly, is aimed at teaching all people on Earth on how to behave properly. In the following section, I employ a semiotic reading of Covid-19 etiquette guides presented on the WHO website, and discuss how these images semiotically communicate neoliberal ideas about normal social contexts and bodies, and how this meaning is subtly dissolved in the visuals. While the images presented below

form a small fraction of all images presented on the website, they nonetheless send a powerful message about space, care and body via cascades of emotional actants that could be semiotically encountered.

Consider the Covid-19 etiquette image pictured above, from the 'advice for the public' section of the website, rendering a default setting for a person diagnosed with Covid-19. This image establishes a connection with a reader by naming them 'you'. Everything around the dwelling is rendered as a monotonous, solid space in purple, with public health signs and warnings placed on it. Textually, the statement that a Covid-infected person ('you') has to stay in a separate room and away from others presupposes that people have access to rooms with windows, separate from others, and that frequent opening of windows is possible. Both statements are accompanied with bullet points, which generally add clarity and certainty to the statements. Visually, a default dwelling is rendered as a boxy, isometric projection; spacious and tidy. The isometric representation is a powerful technique for showing three-dimensional objects in two dimensions, enabling the above-mentioned flattening of the space. We observe the inside in a top-down manner: from above and through the hypothetical roof, signifying the governance or high powers that are observing people, reminiscent of how players control characters in management video games such as 'The Sims'. There is a window open inward, with arrows indicating airflow, presuming there is open space out there allowing the circulation to happen. Everything else is rendered as static. Two objects inside are red: the door and the

Figure 1. The WHO: Advice for the public, 2021.

t-shirt of a person diagnosed with Covid-19. The established connection between a t-shirt and a door hint at the 'isolation' and 'closedness' of the space and body. In the other room, a small group, probably a family, is well-dressed and organized as a social unit. The 'risk meter' in the left corner points to green, suggesting the social desirability of the entire image. The phrase 'know your risk, lower your risk' further suggests that management of Covid-19 is a question of knowledge and making informed and rational decisions, since 'not knowing your risk will increase your risk'.

Consider another etiquette image from WHO's advice for the public, representing behaviours as three main slider bars depicting location, proximity, and time, which are visually presented as separate and isolated entities. Each slider bar contains binary oppositions, indicating two options that are safe and unsafe, with 17 clearly demarcated positions that a two-dimensional grey slider could occupy. In sociomaterial contexts, slider bars are usually parts of mechanical devices: a person moves sliders with their hands so that

Figure 2. WHO: Advice for the public, 2021

a machine can produce a desired effect. This metaphor makes the implicit assertion that safer Covid-19 behaviours, presented here as dynamic and adjustable bars, are flexible choices to be made. The location ribbon renders two extremes: an empty grey room with a door; and an outdoor environment, signified by a cloud, a patch of grass, a mountain and a tree, without dwellings or visible human activity. This combination signifies a temporary escape from urban 'enclosed spaces', with their monotonous buildings, into romanticized nature, with 'open air spaces' untouched by humanity. This is perhaps a reflection of the trend among members of the middle class who began to actively work from 'green' areas since the beginning of the pandemic, and upper classes who self-isolated on yachts, private islands and other elite spaces. This escape in real-world contexts is a question of socioeconomic privilege, as lower-class people in urban contexts cannot easily afford to 'move' this slider leftwards. Similar patterns of escapism were studied, for instance, by semiotic analysis of SUV advertisements, showing the implicit ideology and constraints attached to the act of leaving behind the "petrified urban environments of postmodern capital" (Gunster, 2004: 27).

The second slider follows a similar trope: on the right there are six people—as grey as the sliders, the room and the mountains—standing without masks in close proximity to one another. Visually, the dense placement of people is not a product of the surrounding area. There are no visual elements that are pushing the people together, apart from the contrasting light blue and blue shapes that delineate three ribbons. On the left, two people are also in the exact same uncontested space, but wearing masks and keeping their distance. The third slider uses the metonymic representation of a 'digital timer' as 'time', whereby a safe choice is to have shorter time periods of spending time with others, ideally '00:00', as opposed to '59:00'. The maximum time represented is less than an hour, misdirecting attention

away from the fact that in densely-populated areas this timer would not be applicable at all, as close contact is an unavoidable and nearly permanent reality.

Finally, consider another collage from the WHO website, suggesting good etiquette while staying home: the #HealthyAtHome campaign.

The campaign's focus on the hashtag implies that its audience would be digitally engaged with the programme, which subtly rules out roughly 40 percent of the world's total population that remains 'offline' (Johnson, 2021). In all images, none of the protagonists are meeting the gaze of the viewer, corresponding to the semiotic realization that Kress and van Leeuwen (2021) term the 'offer', establishing the semiotic illusion that represented participants act naturally in their everyday lives and are not influenced by a viewer.

In the first close-medium shot image, there is a clean, spacious room—probably a living room and kitchen—with a big window and shiny floor. The outside area is green and sunny. In a room a woman, wearing sports clothing, is exercising on a yoga mat, her face a picture of concentration. Next to her is a baby, dressed in colourful clothing, raising a hand toward the woman, trying to get her attention. The eye-level angle promotes the visual signalling of 'equality' (Kress and van Leeuwen, 2021) a viewer 'goes down' with the woman and her child instead of looking at them from above. The image renders a minimalist yet upper-middle-

class setting—the elite space (Thurlow and Jaworski, 2017) emphasizing the flexibility, and allowance for creative ways of self-caring and of staying healthy while in the lockdown that comes with a certain income bracket.

The second image represents healthy dieting. There is a large metal plate on the surface, with a rough hand, probably belonging to an old working-class person placed behind the plate, effectively rendering the first-person impression that the hand belongs to the viewer, or that the viewer is near the implied working-class person. On the plate there are bowls with rice, tea, a boiled egg, egg shells, and a plate with shredded greens and chopsticks. The high angle of the image again semiotically emphasizes the viewer's power, in this case over food and dishes. By portraying a set of simple and healthy food as a matter of readily available choice, the image powerfully misdirects attention away from the fact that that dieting has been a subject of social division in many global contexts wherein wealthier people usually have a better access to healthier foods, and from the alarming rates of global food insecurity more general. Rice and tea are a striking visual cue, requiring the cheap and tedious labour of millions of people mostly in South-East Asia. Approximately 144 million farmers produce rice, while 90% of them live near or below the poverty line, earning between US$2 to US$7 per day on average (Segal and Minh, 2019). According to a

#HealthyAtHome

Staying physically active

Healthy diet

Healthy parenting
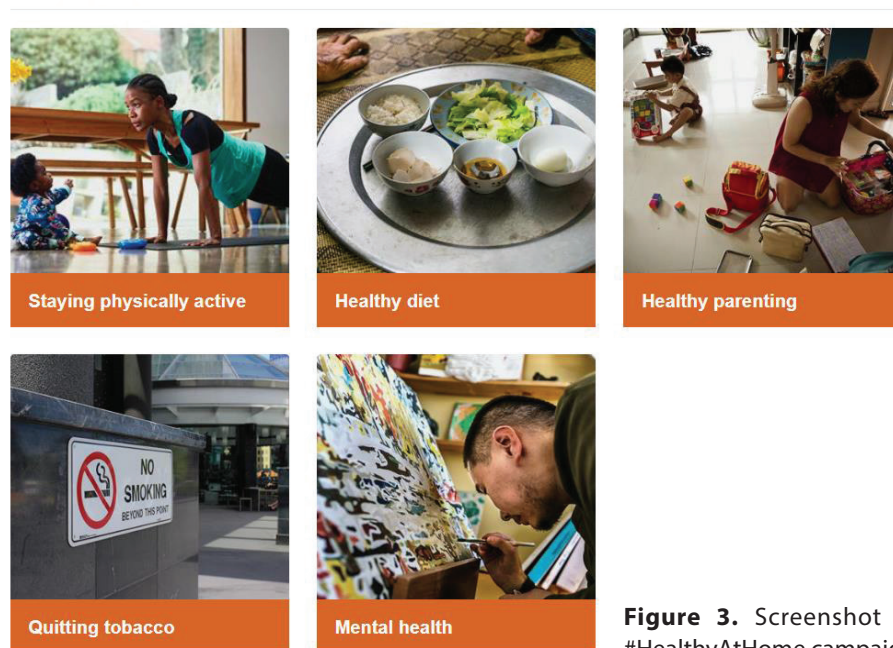
Quitting tobacco

Mental health

Figure 3. Screenshot of the WHO #HealthyAtHome campaign, 2021.

study report on labour conditions on tea plantations in Bangladesh, more than 84% of surveyed workers stated that their income was insufficient to fulfil their family needs (Ahmmed and Hossain, 2016). In India, rations given by plantation estates to tea plantation workers are not sufficient to feed all the members of the worker's household, forcing people to buy additional food from nearby shops, despite the exhausting and low-paid labour (Rajbangshi and Nambiar, 2020). Before Covid-19, precarious labour conditions have already been a key reason behind high suicide rates among farmers. In India alone, more than 270,000 agricultural workers have committed suicide since 1995 (Stephenson, 2013), while pandemic-related bankruptcies and debts add another layer to the desperation (Singh, 2020).

The third image signifies healthy parenting through the image of a mother taking care of a child at home. The high angle signifies the viewer's power. There is a room with white tiles, which centres a woman who is sitting on the floor. Two bags are next to her—a red one with a strap, and a beige one with a top handle. The woman is directing her bodily attention to a basket with colourful, well-organized items, probably the groceries. A paper sheet with tight lettering is placed in front of her body. In the background there is a kid sitting on the floor who is about to open or close a box with colourful cubes, with some of them laying on the floor. It appears that they have just returned from the store, and a woman is verifying the purchases against the list, while the child is opening a new toy set. This depiction of the responsible mother actively providing a child with time, food and toys reflects the uncomfortable fact that in many contexts this form of caring is a luxury; there are widening class gaps that inevitably affect parental investments of money and time in children (Schneider et al., 2018). Moreover, dominant visions of responsible healthy parenting have "sought to impose middle-class mores on working-class parents"(Holloway and Pimlott-Wilson, 2014: 94) contrasting with the concern that neoliberal reforms of social services have "disproportionately rested upon mothers, often from racially and economically marked groups" (Craven, 2014: 9).

The fourth image depicts an urban landscape: glass, marble, tiles, asphalt and windows, with a focus on a warning sign suggesting quitting smoking. In doing so, the image does not represent 'home', but rather a post-industrial urban environment where a person is not supposed to smoke: "No smoking beyond this point". The sign helps portray smoking as an issue for a responsible consumer making bad choices, shrinking wider social, political and economic aspects of tobacco production and distribution. Given the fact that the campaign focuses on 'HealthyAtHome' while the image represents office space, a link could be made coupling home and work. The disappearing boundary between home and work has been marked as another feature of the everyday neoliberal forces that pushes workers to be flexible "within and around work, and in and about employment" (Thomas et al., 2020: 3) and working from home during the pandemic has only accelerated this blurring.

The fifth and final image signifies mental health, as it depicts a person focused on an abstract acrylic painting mounted on an easel. The sense of intimacy is promoted by the close shot, and the participant's power is represented via the low angle (Kress & van Leeuwen 2006). The person is looking up closely and adding a brush stroke to a small area of the painting, suggesting a lot of time, energy and concentration was spent on this work. Behind the person there are well-thumbed books and small format drawings. This image powerfully renders a good mental health subject engaged with creative self-help, focus and mindfulness, while public health services are absent from the image. This depiction goes in unison with the contemporary trend of shrinking public mental health services, with health markets increasingly offering coping alternatives such as self-care and mindfulness, and advising people about their lifestyles under the banner of 'emotional capitalism' (Illouz, 2007).

Taken together, a semiotic reading of Covid-19 etiquette guides published by the WHO suggest such textual-visual elements do not simply guide global communities for safe and responsible behaviour. They also act as defensive semiotic techniques to screen away public tensions from power structures (Hansson, 2018), and channel them directly onto people and their communities. In doing so, the tightly encoded normativity

in analysed elements of Covid-19 etiquette guide direct attention toward:

(1) Being healthy being a matter of good personal health choices

(2) Infrastructures and bodily functions for affording good behaviours are in place and readily available to be practised as a matter of choice,

as well as tropes of 'creative adaptations', 'minimalism', 'individual responsibility' and 'self-care' with regard to Covid-19, while semiotically shifting attention away from the cycle of violence, precarity, and social anxiety, which, as numerous global health scholars have argued, exacerbated inequalities among the most marginalized people around the globe (Abimbola et al., 2021; Jones and Hameiri, 2021; Manderson et al., 2021; Sparke and Williams, 2021).

Toward semiotic misdirection in global health

Moving forward, this means that a surprisingly central role in the production of global health etiquette is played by the labour of graphic designers and networks of visual production, who are dealing with a catch-22 problem: simple texts and images are needed to send effective health messages globally, but these messages render simple realities. To take advantage and stand out, graphic design commonly draws on the advancements of semiotics and psychology (Jackson, 2008; Massironi, 2001; Ockerse and Van Dijk, 1984; Storkerson, 2010; Wagner, 2015) to grab attention and boost engagement. This aspect dovetails with the concern that misdirection, in general, "exploits many of our mind's limitations" (Kuhn et al., 2022: 18) to offer a persuasive story of how reality operates. First, it means that all carefully prepared global health texts and images, whether digital or printed, could be read as persuasive semiotic practices. Second, it suggests that these semiotic practices in global health participate in misdirecting from something—from bodies, sociomaterial realities, people, concepts, institutions—and directing attention toward the 'frontstage' in the spotlight, which is set by the implicit and explicit political goals of power structures. This process could be understood as 'semiotic misdirection' unfolding at the level of global health related texts and images. As global public health and development nexuses have been promoting the socially responsible visual representation of people and their communities (Dolinar and Sitar, 2013; Schroeder and Borgerson, 2005), another step could be acknowledging the semiotic misdirection in global public health texts and images. Moving forward, STS scholars, semioticians and adjacent communities could empirically study the phenomenon of semiotic misdirection in the shared commitment of disturbing a sustained imagination of Global Public Health as a politically neutral and value-free practice.

Acknowledgements

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Tribute to Dan Allman

Dan Allman, our dear colleague and friend passed away during the process of constructing this special issue. Dan's contribution to the special issue, and to the social study of medical research in many parts of the world was immense and he will be sorely missed.

Throughout Dan's career, he examined critically the nexus of public health, HIV research, and HIV vulnerable groups. His work tirelessly brought to the fore the experiences of gay and bisexual men and sex workers in research, calling for more humane, ethical and participatory practices. Sociology, and Science and Technology Studies, were not exempted from his critical analysis – he made non-negotiable arguments for the value of theorisation without applied health value, and blue-skies thinking. His contribution to this special issue continued with a long-standing theme in his work regarding bringing light to the ways in which medical research is socially organised and the ethical and political problems that may arise.

Dan Allman made an invaluable contribution with his ideas, time and insights to the discussion of this special issue's themes, and therefore shaped directly or indirectly all the papers here. At the time of his passing, Dan was working on a paper entitled *Sneaky Means and Risky Business: Intentionality, Misdirection, and Sleight of Hand in Research*. Unfortunately, he was no longer able to finish the peer review of his manuscript. However, we wanted to honour his contribution by presenting some of its key features. Dan's paper focused on one of the central ideas of misdirection: *its relation to intent*. Within it, he considered what happens when elements of research method become compromised and misdirected and what the impact is on research process and outcome.

Traditionally, as applied in magic, misdirection is understood to occur with motive and with intent. Allman challenges this understanding and reflects upon the portability and application of the concept to the topic of scientific research practice.

For Dan, as a lens, the concept of misdirection offers a unique way to think through intent, the boundaries between deception and poor methodological practice. Deception, as both enacted and perceived, can take a multitude of forms. Both the causal act of deceiving and the resulting deceptive effect can be intended or unintended. Misdirection with the intent to deceive can be referred to as *primary misdirection*. Intentional misdirection in research can be a form of 'sneaky means' deception. Misdirection, however, can also occur in the absence of intent, owing to unskillfulness or misjudgement in research design, measurement, or interpretation. Dan referred to this unintentional misdirection as secondary misdirection or *shadow misdirection* —a sleight of hand, unplanned, involuntary, and unpremeditated but which may still fracture and obscure relationships between cause and effect.

To generate a better understanding of the role of intention in misdirection, Dan used two case studies. In the first case study, he revisits a case of deception in the classic social sciences study of Humphrey's (2017 [1970]) Tearoom Trade as intentional misdirection. Humphreys, observing sexual acts in washrooms in St. Louis, uses multiple forms of deception with intent during his covert research. Within scientific inquiry an intent to deceive is often justified relative to the likelihood of harm, beneficence or intended outcome.

To illustrate unintentional scientific misconduct and misdirection, Dan used a case from the

natural sciences, the notorious 1960s example of the discovery of anomalous polymerized water known as polywater. Polywater, discovered in 1962 in the Soviet Union, was considered to have a lower freezing point and a higher boiling point than ordinary water. In time, however, critiques would debunk these assertions by concluding that polywater was the result of spoiled experimental samples. The story constitutes an example of how scientists were unintentionally misdirected for several years, leading to hundreds of publications on the topic, until the authors admitted in print that the anomalous water was merely a solution of impurities. It is an example exacerbated by the chill of Cold War politics, the fact that initial publications were only written in Russian and that some of the scientific techniques were unfamiliar to Western researchers. Today polywater stands as a valuable example of unintentional misdirection. Although the outcomes were benignly unintended, the lessons learned have important implications in terms of conceptualizing disreputable science. It is the slight-of-hand arising within the risky business of research, a form of error. Utilising intent to unpack misdirection allows

insights into the construction of achievement in research, the mechanisms scientists use to attain it, and the pressures they experience to do so.

Sneaky Means and Risky Business extends Allman's existing work on 'boundaries and points of difference' between the pseudo and legitimate (Allman, 2019). It marks his characteristic interrogation of how scientific claims are made in communities of practice, an attention to participation threaded throughout his entire body of work. This collection was shaped by his insights, and it is our hope that readers take from both the special issue and our summary of his paper, the benefits of exploring questions of misdirectional intent in the pursuit of ethical and more participatory scientific practice.

We are grateful for the time we had with Dan – the workshops, travelling to different countries and working on projects with him such as this special issue. We are grateful for the chance to experience his intellect, humour and thoughtfulness as his colleagues, friends and co-conspirators in carving out safe spaces for difference and acceptance. Thanks for everything Dan.

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Louvel Severine (2021) The Policies and Politics of Interdisciplinary Research. Nanomedicine in France and in the United States. London and New York: Routledge. 180 pages. ISBN: 978-0-36719-243-3

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Countless books on interdisciplinarity have been published over the last 50 years. *The Policies and Politics of Interdisciplinary Research* by Severine Louvel, however, is of a different kind. Here, the author departs from both the celebratory literature on interdisciplinarity and the abundant 'how to' instructional reports on recommendations for successful interdisciplinary research centres and training programs. Instead, Louvel offers a critical perspective that will undoubtedly be of interest to STS scholars. She makes an original contribution to the literature on interdisciplinarity by examining the emergence and institutionalisation of nanomedicine in France and the United States.

Louvel's book comprises seven chapters, each of which examines key settings where interdisciplinary policies and knowledge politics intertwine. These settings (chapters) include funding programs and their impact on interdisciplinary groups; peer-reviewed journals; university research hubs; discourses around interdisciplinary research; the relationship between established disciplines and the nascent nanomedicine field. The book as a whole serves as a thematic exploration of the institutionalisation of nanomedicine rather than a sequential development of an idea; therefore, individual chapters can be read as part of the collection or independently.

The richness of Louvel's book precludes from trying to thoroughly address every aspect in this review. I will thus focus on the chapters making key contributions to the understanding of interdisciplinarity; specifically the ones that I found the

most fascinating from my own standpoint (i.e. as a sociologist of knowledge interested in the relationship between disciplines and interdisciplines and in the rhetoric around interdisciplinarity).

Louvel's analytical ground is at the crossroads of science studies and the political sociology of science. She focuses her attention on the politics behind interdisciplinary policies. She frames interdisciplinarity as a mode of knowledge production socially constructed by organizations, actors, interest groups, etc., each with their unique vision, goal, and level of power. Louvel argues that current policies are creating a new sociopolitical order in academia, resulting in a redistribution of power between stakeholders. As she puts it, her goal is "to contribute to the critical studies of interdisciplinarity by investigating the economic, political and sociocultural purposes underlying interdisciplinary policies" (p. 16). Building on Frickel and Moore's (2006) influential book, *The new political sociology of science*, the premise underpinning her work is that the understanding of science–and thus interdisciplinarity–needs to take into account the interplay between internal and external forces to the scientific field. Dissociating the scientific field from its social environment can only yield a partial understanding.

Louvel's book builds on a vast body of work on disciplines and interdisciplinarity. In the Introduction and Chapter 1, she brilliantly summarizes ongoing debates. The scope and depth of Louvel's synthesis is worth mentioning. Her analysis is comprehensive such that even well-versed

scholars in interdisciplinary studies will undoubtedly benefit from the new light she casts on extant work. Novices will gain a reliable and thoughtful introduction to the most pertinent STS and sociological literature on interdisciplinarity published in recent years.

In Chapter 2, Louvel perceptively demonstrates that the institutionalisation of nanomedicine as an interdisciplinary field does not necessarily imply the elimination of boundary work or divisions between research groups. Scientists from different disciplines navigating their career within nanomedicine each pursue various interests and career goals. As she emphasises, if researchers in nanomedicine wish to "foster shared commitments toward interdisciplinarity and promote it as a whole" (p. 29), they also seek to differentiate themselves from other sub-groups and maintain social and symbolic boundaries around their specific sub-research area. Behind the 'unified front' of nanomedicine, Louvel argues that an internal reality exists where each subdiscipline is actively positioning itself in a struggle for authority and resources. This boundary-work gets operationalised through discursive strategies: researchers engage in definitional struggles within nanomedicine to promote their own ways of seeing and conducting research while devaluing alternative ways. Louvel's findings are novel as they challenge the widespread belief in academic circles that interdisciplinarity creates research spaces free of divisions. Building on a large set of empirical data including interviews, document analysis, and bibliometric measures, Louvel persuasively casts doubt on this perspective.

The conclusion reached by Louvel highlights a central, but underexamined, question in interdisciplinary studies: Does interdisciplinarity remove boundaries, relocate them, and/or create new ones? Louvel expands on previous work addressing this question, for example, Albert et al. (2017), Jacobs (2014), Moore (2011), Panofsky (2011). Louvel's close examination of the inner dynamics of nanomedicine serves to demonstrate that even a field that appears to be united from the outside can remain fragmented in the inside. Nanomedicine is a convenient umbrella term—as it provides public visibility and attracts funding—but, as a research field, it appears to be the locus of internal struggles for authority and recognition between research groups–thus relocating existing boundaries and creating new ones.

A second key argument developed by Louvel is that an interdisciplinary research field can flourish with the support of disciplines. Contrary to the commonly held position according to which disciplines and interdisciplinary research are antithetical—the latter being often seen as a mode of knowledge production freed from the former—Louvel shows that this is not necessarily the case. She cogently articulates this idea in Chapter 6.

The institutionalisation of nanomedicine research followed two different paths in France and United States, but in both countries established disciplines and departments were vital to its development. They provided organisational stability, student enrolment, faculty positions, and research spaces. In the United States, nanomedicine was housed within graduate research programs in the newly created departments of biomedical engineering. In France, in the absence of powerful biomedical engineering departments, nanomedicine found its institutional home in departments of physical sciences and pharmaceutical sciences.

As Louvel rightly contends, disciplines and departments are often portrayed as being rigid and exclusionary (see for example Crow and Dabars, 2014). These traits arguably preclude them from being able to accommodate the organisational flexibility required by interdisciplinary research. Louvel's findings, however, suggest that this view needs to be reconsidered. Both in France and United States, the connection between established disciplines and the emerging field of nanomedicine were synergistic and profitable to both. In France, by creating a new academic space for scientific discovery, nanomedicine provided established disciplinary departments a renewed identity that proved instrumental for acquiring national visibility at the university level. Nanomedicine researchers, in return, gained access to a steady flow of graduate students. In the United States, a similar synergistic relationship occurred; nanomedicine mobilized the national reputation of biomedical engineering departments into a higher profile for itself. In turn, its association with these departments helped them to stand out from their competitors within the scientific community.

Louvel's book should be read as a thorough examination of the institutionalisation of nano-medicine in France and the United States and, more broadly, as an essay on the complicated relationships between disciplines and interdisciplinary research fields. At the end of the book, readers will know more about nanomedicine and its development within the academic field. They will likely also appreciate how Louvel shakes up many of the taken-for-granted assumptions and unproven facts about disciplines and interdisciplinarity.

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van de Wiel Lucy (2020) Freezing Fertility: Oocyte Cryopreservation and the Gender Politics of Aging. New York: New York University Press. 344 pages. ISBN: 9781479817900

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At the outset, sociologist Lucy van de Wiel's book 'Freezing Fertility' invites the reader on a journey to follow the human egg across time and space. Originating from the body and following a decision to preserve one's fertility from a ticking 'biological clock', eggs may be extracted and make their way to the freezers of biomedical facilities worldwide, thereby becoming part of wider, politicized infrastructures of oocyte markets. However, despite its cultural prominence, egg freezing in the Netherlands, the UK, and USA – the geographical focus of van de Wiel's analysis— is still a relatively small niche market where, with the help of in-vitro fertilization (IVF), only around 2-5% of people later decide to turn their eggs into human life, sometimes unsuccessfully. Given that most clients of the already small field of oocyte cryo-preservation (OC) are well-off, well-educated, white, middle-class women, we may ask how much OC may really contribute to the wider socio-political discourses on reproductive policy and STS scholarship more generally.

But 'Freezing Fertility' is far from being a dry, jargon-laden book about oocyte technologies. Instead, van de Wiel, a cultural analysis scholar by training, manages to shed new light on the wider gender politics of aging by tracing out and sharply analyzing stories of anticipation, anxiety, loss and control in newspaper articles, websites, online blogs and TV documentaries. At the heart of these accounts, is the cultural trope of the 'biological

clock'— a widely found narrative that emerged in the 1970s with the advance of contraceptive technologies and more opportunities for women in the job market. Through close reading of various cultural artefacts, van de Wiel argues that the emblematic ticking of a woman's clock has gained a different quality now that novel opportunities to freeze fertility have emerged, allowing people to conceive later in life. According to van de Wiel, these culturally mediated narratives between fear and hope render fertility inherently precarious and therefore in need of social and medical intervention.

Following on from this, one of the key conceptual threads and theoretical contributions of the book is the concept of chrononormativities, the idea that institutional norms and patterns are temporal in nature. In relation to gender politics, one obvious chrononormativity is the aforementioned notion that women bodies are "in decline" (p.42) and that women need to hurry up if they want to 'have it all'. Men's fertility, on the other hand, is relatively stable, even in older age, which seems to alleviate the perceived sacrificial burden of choosing family over career, thereby exacerbating gender-related income inequalities and the persistence of high numbers of men in managerial positions.

But other chrononormativities that van de Wiel draws out are much more subtle. In a balanced analysis of a Dutch documentary, the protagonist

is shown to be reminiscent of her own childhood pictured in grainy, old home videos and photographs of her family. Here the protagonist's "proximity to [reproductive] retrospection" (p. 77) produces and informs her desire of a reproductive future. The tension between retrospection and anticipation of child rearing then shapes a *reproductive orientation* (p. 73). A reproductive orientation is a term borrowed from feminist Sara Ahmed and can be understood as the continuation of what is already 'there' and what we deem normal or desirable in the context of usually heteronormative practices around sexuality, fertility and family dynamics. It thereby creates a distinct orientedness towards the future that inevitably steers reproductive decision-making.

But these temporal logics of reproduction are not solely produced within the confines of an individual's body or close family ties. Once extracted, the eggs become part of a wider network of biomedical technologies and the ways they are operationalized and marketed. With each different actor that comes into contact with the eggs, be it through perks or insurance schemes at companies like Facebook or in labs through time-lapse imaging techniques, van de Wiel introduces the reader to yet another temporal dimension of cryopreservation. As the books develops and shifts in empirical scales and scopes, temporal perceptions shift alike. Eggs then no longer just operate under the logic of a time economy and loss but become part of an "alternate temporal logic of frozen time and averted loss" (p. 84), that nuances OC into languages around postponement of parenthood, extension of fertility, aversion of infertility and a data-driven approach quantifying, slowing down or speeding up origin stories under the microscopes of fertility clinics. 'Freezing fertility' thus contributes to an emergent vocabulary of various new temporal forms of fertility planning, whether or not there is a wish for a child or an imminent danger of infertility. These new temporal dimensions then re-contextualize the interface between cell and self, body and state, technology and reproductive policies and open up new questions to STS scholarship more widely.

Throughout, the book also dips its toes into wider feminist and political theory and points towards issues of social inequalities within the OC discourse. For example, when it nods to Donna Haraway's kinship making technologies (p. 95), points to Sara Ahmed's willful objects (p. 150), mentions Nancy Fraser's ideas around financialized capitalism (p. 54) and hints towards Melinda Cooper's analysis around family values and neoliberalism (p. 161). However, the book stays frustratingly brief in its engagement with theory and only latent in its potential to develop a *political bite*. Indeed, the author points out that her "intention was to find a language for a nonanxious fertile embodiment" (p. 234), but by doing so, it misses the opportunity to take a loud, affective, and indeed affected, stance against agism, sexism, racism, or neoliberalism which seems so crucial in feminist scholarship and wellbeing (see Ahmed, 2017). van de Wiel's caution to become too political then leaves many socio-political and ethical questions around OC unanswered. For instance:

- Is the notion of motherhood at all costs still ethical in the light of multiple refugee crisis and climate justice (see Haraway's (2015) call to make kin not babies)?
- What slippery slopes around the potential eugenics of choosing the 'right' egg can be identified in the face of fast-paced advances in biomedicine?
- To which extent is the "taking back control of the body" yet another way to promote a meaningless version of empowerment, enabling neoliberal marketing strategies targeting women through sexist tropes and traditional gender norms?
- Is OC perhaps romanticizing ideas of single motherhood, not taking seriously the continuous struggles of being a low-income parent caught up in structures of domestic violence and oppression (see hooks, 2015)?
- Is OC giving a male-dominated labor market a free pass to continue with discriminatory and punitive practices around pregnancy and parental leave?
- What onto-epistemological impact does an empirical focus on OC-motherhood have on how we perceive 'conventional' motherhoods?

Despite its partly untapped potential to develop a more critical political stance against 'anticipatory regimes' (p.66), hetero-normative assumptions of what it means to be a (fertile) person with ovaries, and stubbornly persisting gender, health and income inequalities, van de Wiel nevertheless manages to develop a nuanced understanding of how temporal imaginaries are constructed at the nexus of culture and technology and what that tells us about current and future gender politics of aging. This becomes especially exciting in the last few pages of the book (pp. 234) where the author traces out future avenues for research policy and practice around the notion of *fertility literacy*—an ability to understand "the rhetorical framing of fertility facts, situating one's experiences within sociocultural and political-economic systems, and positioning oneself against structures of power" (p. 234). This call speaks to pressing concerns around a 'post-truth era' of public (health) policy and how health and pharma companies monetize the vulnerabilities of those who can afford to pay back their debt (see Dumit, 2012). As an antidote, van de Wiel's fine-grained temporal, spatial and multi-actor infrastructure analysis may help contribute to such literacy and help people make informed reproductive decisions in a fast-changing world.

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