The Art of Sonic Deception

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Abstract

Sonic deception is the tactical use of sound to confuse, misguide and disrupt. Discourses of deception, trust and the semiotics of suspicion often neglect sound in favour of more linguistic, verbal readings. Drawing on Goodman's (2009) analysis of the vibrational force of sound in conflict and its potential as a sensory tactic of fear, the work of sound artists including Joe Banks (aka Disinformation) and the work of Martin Howse, Eric Berger and Mario de Vega in making audible the electromagnetic spectrum, this short paper examines the relationship between sound, deception, obfuscation and trust. Within this links are made to United States military parlance, in particular Information Operations or Influence Operations and full-spectrum dominance, whereby modern warfare is centred on a battle for public opinion, which purposefully manipulates human cognitive and emotional fallibility. It is from this viewpoint that the role of sound within contemporary deception is examined. This paper concludes that sound calls for a closer examination of the multiplicitous ways in which mis- and disinformation occurs, while also challenging us to take a multi-sensorial approach to the politics of frequency.

Keywords

Deception; sound; art; influence operations; full-spectrum dominance; multi-sensorial politics of frequencies; response-ability.

1. Introduction

On 30 May 2000 the United States (US) Department of Defence (DoD) released the document *Joint Vision 2020 – America's Military Preparing for Tomorrow*. Within it the capabilities of adversaries to either have similar technology, or be able to adapt to the forces technology, is considered as a serious threat. To address this, full-spectrum dominance is required in order to 'win'.

Full-spectrum dominance is defined as "the ability of U.S. forces, operating unilaterally or in combination with multinational and interagency partners, to defeat any adversary and control any situation across the full range of military operations" (p.61). As noted:

> Conflict results in casualties despite our best efforts to minimize them and will continue to do so when the force has achieved full-spectrum dominance. Additionally, friction is inherent in military operations. The joint force of 2020 will seek to create a 'frictional imbalance' in its favor by using the capabilities envisioned in this document, but the fundamental sources of friction cannot be eliminated. We will win - but we should not expect war in the future to be either easy or bloodless. The requirement for global operations, the ability to counter adversaries who possess weapons of mass destruction, and the need to shape ambiguous situations at the low end of the range of operations will present special challenges en route to achieving full spectrum dominance. (p.61)

Fictional imbalance and the shaping of ambiguous situations are in essence tactical approaches through which information superiority is achieved. Information superiority referring to

> …the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same; achieved in a noncombat situation or one in which there are no clearly defined adversaries when friendly forces have the information necessary to achieve operational objectives. (p.61)

Such language, it could be argued, has in part set the foundations for what we now define as a post-truth politics, where 'facts' are malleable. More precisely Applebaum (2018) in her work on Western and Russian democracies, and others (Benkler, Robert and Roberts, 2018; Jackson and Jamieson, 2007; Kick, 2009; Stahl, 2006) in their analyses of social media polarisation, algorithmic

bias towards extreme views and the lack of regulation on facts in media, refers to this trend as the purposeful use of mis- and disinformation. However much of the work on mis- and disinformation has focused on the power of the verbal and written word, consequently it fails to take into account other forms of sensory distortion, including what is referred to here as sonic deception. This short essay attempts to sketch out some of the issues relating to such auditory distortions and draws briefly on work of artists, who address these topics, including that of the music producer, author and DJ, Steve Goodman (2009) on sonic weapons and the artist Joe Banks (aka Disinformation), who has looked at the issue in relation to electronic voice phenomena and other distortions of aural perception (Banks, 2012). Specifically and with regarding to manipulations of the electromagnetic spectrum, artists such as Martin Howse, Erich Berger and Mario De Vega works is particularly relevant (Dillon, 2015, 2016a and 2016b; also see Kahn, 2013). These artists have specifically played with the notion of the eavesdropping potential that digital devices emit, with reference to the US government's declassified document 'Tempest', which was released in 2007 and states:

> Any time a machine is used to process classified information electrically, the various switches, contracts, relays and other components in that machine may emit radio frequency or acoustic energy. These emissions, like tiny radio broadcasts, may radiate through free space for considerable distances – a half mile or more in some cases. (NSA, FOIA Case # 51633, SECRET, 2007, p.26)

Prior to this document release, Wim van Eck's (1985) seminal paper demonstrated how it is possible to "obtain information on the signals used inside the equipment when the radiation is picked up and the received signals are decoded" (p. 269). Essentially van Eck proved that cheap, off-the-shelf equipment could enable the electromagnetic emissions emitted from a devices tube or display to be collected, demodulated and interpreted. Berger drew on van Eck's work and in a nod to the NSA document, created *Tempest*, whereby the radio waves produced by a screen playing a series of generative graphics are captured using various radios tuned to different AM frequencies. Similarly Howse extensively explored van Eck like techniques within his *XXXXX* (2001-2008) and *micro_research* (2007-2009) workshop programmes[1], which in part informed the development of his *Detektor device* (in collaboration initially with Berger and later with Shintaro Miyazaki). Likewise de Vega, in collaboration

[1] http://www.1010.co.uk/org/xxxxx_micro_research.html [Accessed 20 April 2018]

with Victor Mazón Gardoqui, has employed similar 'sniffing' techniques within his workshops[2] and art installations (eg *Doleman*, 2015). However while these artists have illustrated how through sound various forms of inception can occur, it is the following example drawn from a more recent series of incidents in Cuba that will be the focus in relation to questions of distortion and obfuscation.

[2] r-aw.cc. [Accessed 10 October 2018]

2. Fear and Loathing in Cuba

From late 2016 through to August 2017, US government personnel serving on a diplomatic assignment in Havana, Cuba, reported neurological symptoms, including headaches, dizziness, hearing loss, fatigue and nausea associated with exposure to auditory and sensory phenomena. In January 2018 the former Secretary of State Rex W Tillerson (February 2017 - March 2018) opened up a formal inquiry into the cause of these symptoms, which in various international papers was reported as a mysterious 'sonic attack'. The University of Pennsylvania's Center for Brain Injury and Repair was selected to coordinate multidisciplinary clinical evaluation, treatment and rehabilitation of individuals affected. Of the 25 individuals that reported symptoms, 21 were evaluated (11 women, 10 men, mean age 43 years), with multidisciplinary evaluations taking an average of 203 days. Out of this group, 18 of the 21 individuals reported hearing a novel, localised sound at the outset of symptoms in their homes and hotel rooms.

> Affected individuals described the sounds as directional, intensely loud, and with pure and sustained tonality. Of the patients, high-pitched sound was reported by 16 (76%), although 2 (10%) noted a low-pitched sound. Words used to describe the sound include "buzzing," "grinding metal," "piercing squeals," and "humming." The sounds were often associated with pressure like (n = 9, 43%) or vibratory (n = 3, 14%) sensory stimuli, which were also experienced by 2 of the 3 patients who did not hear asound. The sensory stimuli were likened to air "baffling" inside a moving car with the windows partially rolled down. Both the sound and sensory stimuli were often described as directional in that the individuals perceived a distinct direction from which the sensation emanated (hereafter referred to as directional phenomena). Further, the directional phenomena appeared to be localized to a precise area, as individuals (n = 12, 57%) noted that after changing

> location, the sensation disappeared and the associated symptoms reduced. Five individuals (24%) reported covering their head and/or ears, although doing so did not result in attenuation of the directional phenomena." (Swanson, Hampton, Green-McKenzie, Diaz-Arrastia, et al, 2018, p.1127)

The key findings revealed that the cohort had difficulties in remembering and felt cognitively slow. The team ruled out the effect of collective delusional disorders, including mass psychogenic illness. They also concluded that it was unclear if or how the noise was related to the reported symptoms, as sound in the audible range is not known to cause persistent injury to the central nervous system. Given that the individuals all appeared to have sustained injury to widespread brain networks without an associated history of head trauma, the conclusion was that the described, audible sounds might have been associated with another form of exposure.

In the run up to the inquiry, multiple news articles (Devlin, Aug, 2017; Robles and Semple, Aug 2017; Erikson, Sept 2017) described experts analysis of this 'other form of exposure' as a sonic attack in the form of ultrasonic frequencies, which are not audible to humans. Other news reports speculated on the influence of Russian operators, including the potential for a chemical attack. The Cuban government also came under severe scrutiny, despite animatedly denying that a sonic attack could not cause neurological damage at such a distance. Nevertheless, as a result of the situation Mr Trump expelled 15 Cuban diplomats from the US, an act that in part undermined Barack Obama's 2015 move to re-establish diplomatic relations with Cuba. Additionally, regardless of the University of Pennsylvania's report, which was published on 20 March 2018, two months later international papers reported that diplomats visiting China sustained similar 'sonic attacks' to those experienced in Cuba. Other potential scenarios also put forward by experts in international newspapers (Newsweek, May 2018) have described the auditory exposure as a result of surveillance. For example in the Newsweek article, Professor of Computing at the University of Kent Ian McLoughlin notes how ultrasound is used in forms of active surveillance whereby people's mouth patterns in noisy locations can be masked or tracked (refer here to the previously noted van Eck experiment). While not intentionally aiming to disrupt a person, McLoughlin notes that such surveillance could have led to cavitation damage, particularly when the person is near the sensor. If multiple sensors are in place then "waves from different emitters could combine at the eardrum, causing much higher energies. Sitting in the wrong position for too long could then cause hearing damage without the subjects noticing" (McLoughlin, 2018).

3. Ecologies of Anxiety and Alarm

As part of the AUDNIT group's *Unsound: Undead* symposium at Spike Island, Bristol on 20 April 2018, Steve Goodman contextualised the above events in Cuba in relation to his previous work *Sonic Warfare Sound, Affect and The Ecology of Fear* (2009). In this book Goodman discusses the affective tone that is the purposeful use of sound and vibration to physiologically and emotionally modulate a person's or population's mood, as well as modulate the material, living and non-living environment. The purposeful deployment of sound to disrupt an object's or persons vibrational frequencies can be achieved through the manipulation of the electromagnetic frequencies, in particular the infrasonic (under 20Hz), ultrasonic (above 20,000Hz) and audible ranges (20-20,000Hz). Concrete examples of the use of such tactics within war however are difficult to fully pin down. Although there are cases, Altmann's (1999) review *Acoustic Weapons - A Prospective Assessment: Sources, Propagation, and Effects of Strong Sound*, illustrates the lack of evidence. As noted by Altmann and later Valencia (2007), the actual available evidence and use of such sonic weapons is shrouded in secrecy and often classified. √While Goodman's work and that of the collective AUDINT[3], which Goodman is a member, goes some way to collate both anecdotal and critical examples. It could also be argued that the classification of such information in and of itself is a form of deception, which in turns leads to intentional forms of obfuscation that can result in a range of outcomes from expert speculation to full-blown conspiracy theories. It could also be argued that such loops are also considered approaches to ensuring that certain realities are obscured from view, deliberately constructed and purposefully played out in the public imagination as a viable means of distracting from other situations.

4. Deception and Trust

While it is not possible to go into the details of theories of deception here, for the purpose of this short paper deception is defined as "intentionally, knowingly, and/or purposely misleading another person" (Levine, 2014 p.2). And while deception has shown to be part of many types of communication and interaction (Buller, Burgoon, Buslig et al, 1998; Ekman and Friesen, 1969; DePaulo, Malone, Lindsay et al, 2003; Zuckerman, DePaulo and Rosenthal,

[3] http://www.audint.net/ [Accessed 20 April 2018]

1981), sound is often not discussed in this context and is more broadly defined (see section 3) as a weapon and more specifically as a Non-Lethal Weapon (NLW). NLWs are tools and tactics that aim not to shoot or kill but to control, deter, disperse and segregate. Yet as noted in the opening abstract for this paper, modern warfare is now centred on a battle for public opinion, which purposefully manipulates human cognitive and emotional fallibility. Given this, the role of NLW's and in particular the use of sound to create fictional imbalance and shape ambiguous is necessary to both address and explore.

As Nichols notes:

> The experience of auditory stimuli is a function of the nervous system. We are culturally conditioned to interpret sounds, and recognise them,which is why we are roused to anxiety by an experience we can neither interpret nor dismiss as 'noise'. The very fact that infrasound can be 'felt' but not heard creates a frustrated perceptual impulse. Anxiety can only be resolved by attaching it to an object or cause. In the absence of either, we tend to create one, and in most instances we create a supernatural or preternatural one. (Nichols, 2000)

Within the case of the US diplomats in Cuba, whether sound was purposefully used or not what is clear is that the outcome of the situation undermined diplomatic relations. Frictional imbalances were achieved and in a politics of retraction, Trump dismissed a number of Cuban diplomats from the US and for a period of time placed an international spotlight on a nation that is still stepping into its new identity, by recasting it as the 'mistrusted' other.

5. Why we need a Multi-sensorial Politics of Frequencies

In summary, the US Department of Defence Joint Vision document explicitly notes how fictional imbalance and the shaping of ambiguous situations are essential tactical approaches through which information superiority and the destabilising of so-called adversaries is achieved. In the case of the Cuba example, anxiety was aroused via perceptual cues, which were apparently although not conclusively created via ultrasound. This in turn triggered a whole series of reports and investigations that could in some cases be considered as smokescreens for other activities, potential mistakes or oversights or the deliberate attempt to undermine and derail the other. Whatever the intended

outcome such examples highlight how we need to move beyond the analysis of verbal and linguistic forms of mis- and disinformation and instead take a more multisensory account of such happenings. As typified in the Cuban example, the site-specificities of the EM spectrum manipulation are grounded within micro-localities, which according to the diplomats' accounts varied from one spot to another. Such micro-locations further highlight the vital role in understanding the nuanced affairs of how the body and therefore the mind can be manipulated. Drawing on eco-feminist perspectives, such examples of sound cultivate what Donna Haraway calls "response-ability" (p.34), that is to develop a more attuned collective sense of knowing and doing that takes into account who and what is present and absent. While Haraway's points are focused on our kin relationships with other species, her call for "response-ability" considers the multiple materialities of site and place through which forms of distortion and manipulation occur. Taking this one step forward, such a multisensory analysis needs to also consider non-human species whose voices have yet to be considered within post-truth, dis- and mis-information narratives whereby the misrepresentation of environmental and climate change issues is undeniably one of the most urgent of matters.

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