

Sensing the Pandemic: Revealing and Re-ordering the Senses

Dr William Tullett^{a*} and Dr Hannah McCann^b

^aFaculty of Arts, Humanities, and Social Sciences, Anglia Ruskin University, Cambridge, United Kingdom; ^bSenior Lecturer in Cultural Studies, University of Melbourne, Melbourne, Australia

*Faculty of Arts, Humanities, and Social Sciences, Anglia Ruskin University, East Road, Cambridge, CB1 1PT, United Kingdom.

Sensing the Pandemic: Revealing and Re-Ordering the Senses

This article reviews an assembled archive of literature published to date on the sensory dimensions of the COVID-19 pandemic. Just as sensory scholars have often highlighted periods of sensory revolution, we find that the recent pandemic has augured some notable shifts, albeit often on the more micro and domestic scale. We present a five-sense sensorium that offers an overview of how the senses have been engaged with by scholars during the pandemic, and what the major issues and themes have been. Drawing on the literature we suggest that there have been shifts in our sensate experiences and an increased awareness of the sensory dimensions of daily life that may usually go unnoticed. However, we also note the many sensory-related inequalities that have been revealed over this period, that continue to unfold unevenly as the pandemic continues. We argue that going forward sensory scholars ought to attend to these questions of inequality, as well as tracking the possible undoing of some of the sensory revolutions that may have taken place so far.

Keywords: covid-19; touch; smell; taste; sight; sound; pandemic.

Sensing the Pandemic

In April 2020 sensory historian Mark Smith wrote that ‘Courtesy of COVID-19, we are undergoing a sensory revolution’ (Smith 2020, n.p.). Sensory historians have often talked in such terms. Alain Corbin (1986) charted an eighteenth-century ‘olfactory revolution’ (61), David Barnes (2005) has pointed to the ‘sensory crises’ caused by nineteenth-century urban sanitation, and Sara Danius (2002) has suggested that early-twentieth-century technologies of perception unleashed a ‘crisis of the senses’ (3). What is different about the COVID-19 pandemic is, as Smith suggests, the global reach and accelerated pace of its sensory impact.

This article draws on the resources collected by the authors as part of an effort to begin to ‘archive’ the sensory experiences of the pandemic. To respond to Smith’s original assessment, we provide an overview of the scholarly research published thus far

on the senses and COVID-19, and include media discourse where relevant. Whilst undoubtedly radical changes occurred in sensory environments as a result of the pandemic, it is difficult to ascertain at this stage whether the medium- or longer-term outcomes will be 'revolutionary'. We argue that the overall sensory impact of the pandemic has been enormously varied. It has seen moments of revelation, in which the ordinary sensory politics of daily life have been exposed or highlighted, moments of re-ordering in which the daily social life of the senses has changed, and moments of accentuation or acceleration in which existing sensory cultures or trends have been strengthened and exacerbated.

Of course, the impact of the pandemic on the senses has also varied geographically, and it would be foolish to claim a series of uniform sensory changes have taken place. In many cases responses to COVID-19 have reinforced pre-existing sensory inequalities and divisions. We cannot do justice to the multiplicity of pandemic experiences in this short article. However, by providing an initial survey arranged around a five-sense sensorium, we hope to inspire further scholarship in interdisciplinary sensory studies that engage with the pandemic and its sensate legacies.

Touch

Touch was arguably the first sense to gain popular attention as a result of COVID-19, given the embodied 'threat' that physical proximity and touch of bodies/surfaces was thought to pose in terms of viral transmission. Fears about the dangers of tactile contamination with long-running historical roots (Cox 2021) re-emerged as ordinarily benign touch became associated with danger (van der Vlugt 2021). Actions relating to touch, such as distancing from others, sanitising before and after touching surfaces, and regular handwashing, have become key to much public

health messaging (Sigley 2020). Despite greater physical distance between bodies on the street, the felt implications of stranger proximity has heightened (Elswit 2021). As Sigley (2020) suggests, while we usually take touch for granted, ‘consciousness of touch has become a social symptom of the pandemic...’ (2). As Dau and Gagné (2020) also remark, ‘Touch is a sense that is particularly haunting now...’ (n.p.).

With the World Health organisation’s confirmation that COVID-19 was indeed pandemic in March 2020, many countries around the world outside of China went into ‘lockdown’. While the extent of lockdown measures varied geographically, what this public health measure essentially meant for many was physical isolation from both strangers and loved ones outside of immediate households. Much popular discourse has focused on the ‘touch hunger’ that many have experienced as a result of physical isolation (Valley 2021, n.p.).

Yet as many scholars have pointed out, the freedom to work from home has been unevenly distributed along race and class lines, with many essential workers forced to continue to work despite the threats posed by physical proximity (Sigley 2020; Valley 2021). For workers in domestic and delivery services, employers have emphasised an onus on individual workers to minimise touch as part of their work in order to keep customers safe (Dey 2020). This has contributed to creating a sense that such workers are always already contaminated (Satyogi 2021). Sigley (2020) reminds us that touch is also highly gendered, and that concerns over changing patterns such as the move away from handshakes during the pandemic were disproportionately about safeguarding touch interactions between men.

Valley (2021) suggests that ordinarily touch provides us with a sense of connection to community, but also reminds us of our individual bodies. Yet in times of physical distancing, connection through digital means has amplified. Though many

used digital devices, various platforms, and video calling to engage with friends and family before the pandemic, research suggests that pandemic conditions have seen much face to face interaction replaced by these means (Watson, Lupton, and Michael 2021). This research has highlighted the importance for people of both seeing and hearing their friends and loved ones, in the absence of proximate bodies. In this way, touch has been replaced largely with other senses such as sight (Dau and Gagné 2020), especially given that ‘Seeing is a way of touching at a distance...’ (Norton 2021, 75).

Yet pre-pandemic there was also already technology to enable physical touch at a distance – such as sex toys which can be operated remotely (Kahn-Harris 2020). As Kahn-Harris (2020) surmises, the pandemic will no doubt bring about greater technological changes that bridge the sensory gaps created during times of lockdown and distance. Indeed the desire for physical distancing to reduce viral transmission has already accelerated the use of robots in various contexts, to carry out routine tasks (such as disinfection) in various settings, from hospitals to restaurants (Zeng, Chen, and Lew 2020).

Despite these touch-replacing/transforming technological accelerations driven by the pandemic, longitudinal research suggests the importance of touch for health and wellbeing outcomes including reducing inflammation (Thomas and Kim 2020). However, given the risks posed by close contact, Thomas and Kim (2020) suggest ‘...physical touch such as hugging with fewer, closer ties may be especially important in this new normal’ (e114). Such opportunities have been difficult for those living alone during the pandemic, though for many there has been a turn to ‘tactile pleasures’ like gardening (Dau and Gagné 2020, n.p.).

While thoughts on touch during the pandemic have largely focused on contact between bodies and surfaces, Elswit (2021) also suggests we think of breath as a form

of touch. With greater understanding of the airborne transmission risks of COVID-19, there has been increased awareness of the riskiness of breath and ventilation, compared to surfaces. Elswit (2021) suggests that given the ‘new choreographies of public movement’ needed, breath be given continued serious attention (73).

George Floyd’s murder at the hands of the police officer Derek Chauvin in May 2020 reinforced the salience of atmospheric inequality with regard to breath during the pandemic. Floyd’s final words, ‘I can’t breathe’, echoing those of Eric Garner, took on a particular significance in the context of the massive disparities in COVID-19 deaths: for example, in the UK statistics suggested that ‘black people, Pakistanis and Bangladeshis [were] almost twice as likely to die as white people’ (Younge 2020). Police forces continued to use tear gas to disperse protestors, despite advice that it helped spread the virus and exacerbate COVID-19 symptoms, shining further light on the state’s power over the right to breathe (Stone 2020).

Smell

The smell-loss that has been symptomatic of COVID-19 has focussed more attention on the charities and researchers who work with olfactory ailments and the functions that smell performs in daily life. However, the pandemic may have also exacerbated pre-existing inequalities connected to environmentally-induced anosmia, parosmia, and hyperosmia. COVID-19 cases and fatalities were highest in those areas where the quantities of nitrogen-dioxide pollution, with its harsh accompanying odour, were most concentrated (Travaglio et al 2021). COVID-19 has therefore exacerbated forms of olfactory inequity by causing smell-loss among those groups who were already most likely to suffer from pollution-induced forms of olfactory dysfunction (Hoover 2021).

However, the renewed focus on smell was not immediate. In the first stages of the pandemic gleaming surfaces and well-washed hands reflected the visual-tactile culture of public health bequeathed to the modern world by germ theory. However, as concerns shifted to airborne-aerosols the emphasis on ventilation, circulation, and compartmentalisation of air that was so crucial to pre-germ-theory public health experienced a resurgence (Keichle 2021). The spectre of invisible airborne infection heightened people's attention to smells. The lingering scent of another person's sweat or deodorant could suggest that an uncomfortable and potentially dangerous exchange of atmospheres had taken place (Sear 2020). Mask-wearing also increased people's attentiveness to and awareness of the smells of their own breath (Faria 2021). With air having 'once again become suspicious', the pandemic revived a preoccupation with fortifying the borders of the inhaling and exhaling body (Harms 2020).

Smell has aided the policing of national as well as corporeal borders during the pandemic. Where airport sniffer dogs previously detected drugs they now also discerned disease, reinforcing the role of the canine nose in policing (Otto et al 2021). The multispecies story of COVID-19 had the 'reek of Orientalism' (Kirksey 2020, 11). Early attempts to attribute the origins of the virus to Chinese wet markets selling bats or pangolin drew on long running 'atmo-orientalist' stereotypes about the olfactory threats posed by Chinese bodies and culinary culture (Hsu 2020, 115). Across the globe, accusations of malodour and lack of hygiene were part of a new wave of xenophobic scapegoating unleashed by the pandemic (Gilman and Zhou 2021). The olfactory artist Brian Goeltzenleuchter (2021) responded with an installation in which the olfactory memories of immigrants were embedded in hand-sanitizer, transforming a technology of sanitary self-policing into a medium for breaking down barriers between individuals.

A surge in the use of fragranced air fresheners, soaps, sanitizers, and disinfectants in response to COVID-19 released a greater quantity of scents and volatile organic compounds into homes (Steinemann et al 2021). Miniature bottles of hand sanitizer carried in pockets intermittently emitted the scent of alcohol and synthetic fragrance into public atmospheres (Young 2021). DIY hand sanitizer recipes included essential oils to ‘enhance’ the smell (Hakimi and Armstrong 2020). Elsewhere, sanitization involved a recalibration of olfactory meaning. In Turkey kolonya (eau de cologne), a smell associated with the hospitality of Ramazan Bayramı at the end of Ramadan, took on new associations when it was pressed into service as a hand sanitizer (Liebelt 2020). In India's Tibetan diasporic communities fragrant pills, incense, and oils based on traditions dating back to the thirteenth century were deployed against the pandemic (Gerke 2020). Across the globe, the pandemic refocused attention on the role of smell in providing protection, purification, or emotional composure.

For some the disruption to the smellscape only became apparent as life began to return to ‘normal’: smellwalks revealed that the scent of clay, concrete dust, and diesel smoke reappeared as construction sites juddered back into life and the scents of street foods and stalls returned to shopping areas that had been eerily odourless during lockdowns (Allen 2021). Attempts to create online replacements for significant annual phenomena – such as the German Christmas markets which were cancelled in December 2020 – revealed how important smell (in this case of mulled wine, roasted nuts, and frying bratwurst) was to the experience and heritage of such events (Parker and Spennemann 2021). By altering rhythms and forcing the development of relatively odourless virtual stand-ins the pandemic was a revelation or reminder of the importance of smell to people’s daily lives and annual traditions.

The home in lockdown offered a mixed 'heretasmic' olfactory experience (Drobnick 2005, 266). For some the 'the smell-lessness of every Zoom' led to a hankering for the return to 'real' life offered by the olfactory (Williams 2021, 195). Companies have responded with candles and fragrances that brought lost public smellscapes into the home, including beaches, offices, bars, bookshops, and locker rooms. Museums and restaurants have experimented with sending scents into the home to accompany virtual exhibitions (Maurithuis 2021) or dining-in experiences (Spence, Youssef, and Levitan 2021).

Multiple news stories suggested that complaints about smells from industrial and waste-processing plants near homes rose during the course of the pandemic as people were exposed to odours for extended periods. The pandemic has therefore added to the awareness of atmospheric inequalities produced by the displacement of air and odour from one population onto another. Vannini (2020) noted 'the acrid smell of the Nanaimo mill cranking out pulp to make N-95 masks for 3M' (272). The individuated airs of mask wearers were kept uncontaminated, at a cost to other atmospheres elsewhere. The disinfectants, masks, gloves, and vaccines that have protected individuals in the pandemic have produced additional waste (Rume and Didar-UI Islamb 2020). This may yet have further impacts on multispecies olfactory interactions with or around waste sites that may, in turn, have implications for further zoonotic disease outbreaks (Doron 2021).

Taste

The pandemic has revealed the often-obscured sensory manipulations and chemical processes that underlie the basic stuff of everyday life, including how our encounters with taste are usually managed. Modern water-supply regimes have tended to de-emphasise the noses and tongues of customers as an irrelevance in determining

potability (Spackman and Burlingame 2018). However, during the pandemic the liquid oxygen used in removing hydrogen-sulphide and its rotten-egg smell and taste from treated water was diverted to COVID-wards in hospitals. As a result several utility companies either urged consumers to conserve their water or warned them that their water might taste and smell different as bleach was used as an alternative chemical for treating the water (Arradondo 2021). Here the pandemic acted as a tide, washing out to reveal the hidden sensory labour embedded in daily life.

The COVID-19 pandemic also resulted in a re-engagement with cooking, baking, and making in many homes. During lockdowns crafting sourdough bread at home became a marker of both cultural capital and a discerning tongue, as ‘tasteless’ supermarket bread simply would not do (Easterbrook-Smith 2020, 40). There was a certain irony to this trend: whilst germs and microbes were being banished from hands and surface, many home-bakers were busy fermenting their way into a middle-class habitus. It has even been suggested that one way in which the gustatory experience of the pandemic may be preserved for the future is in the microbial archives of bodies and sourdough starters (Tracy 2020).

Part of the attraction of baking, coffee-making, and cooking at home – all of which ostensibly surged in the pandemic among those who could afford the time and outlay – was the element of routine which it encouraged (Nguyen 2020). The pandemic’s impact on shopping and supply chains ruptured routines of consumption. Shopping now involved ‘going nowhere’, as many consumers settled into new routines of weekly or monthly deliveries of food and drink (Kassell 2021, 312). Fast-food companies attempted to manage this disruption by offering assurances about contactless delivery, whilst also claiming that their products offered a stable locus for identity and gustatory normality amidst chaos: ‘after many long days of uncertainty, reassurance

sure tasted good' (Sen and Samanta 2020, n.p). Sensory scientists working for major chains even altered the recipes for their products to ensure that they kept their desired taste, temperature, and texture throughout the journey from restaurant to home (Valinsky 2021). Throughout the pandemic, various forms of expertise were mobilized in order to maintain sensory identities and experiences.

During the pandemic many people experienced a more limited palate: caused either by food shortages, income loss, and lock down regulations, or by the smell- and taste-loss that was one symptom of the virus. Studies of eating habits and diet choices proliferated during the pandemic. In many countries mood became more important in determining tastes (Marty et al 2021), less fresh and more non-perishable foods were consumed (Janssen et al 2021), and a higher number of people experienced some form of food insecurity (Armstrong 2021). The symptomatic nature of taste and smell-loss encouraged people to pay more attention to whether their food smelt or tasted as it should. Those who suffered COVID-19 induced smell and taste loss – parosmia and phantosmia – changed their diets as a result by avoiding trigger foods or eating less (Parker et al 2021). The pandemic has led to both short-term shifts in tastes and attempts to shore up pre-existing identities based around food consumption.

Sight

Visuals have played a key role in the pandemic in terms of communicating and tracing public health information, which in part have contributed to the altered visual scenes accompanying pandemic-era life. Public health experts have promoted the importance of simple graphics for conveying key health messages about COVID-19, which draw on 'a unique intersection of the arts and public health' (Hamaguchi, Nematollahi, and Minter 2020, 483). For example, early on in the pandemic graphics conveying the importance of 'flatten the curve' were widely circulated, transforming

public understanding of why certain public health measures were needed (Hamaguchi, Nematollahi, and Minter 2020).

Along these lines, tracking and visualising data connected to COVID-19 has become a part of daily news and social media. This has included everything from daily infection rates, hospitalisations and deaths, to the visualisation of clusters, hotspots and superspreading events, to vaccination rates and targets. Isin and Ruppert (2020) suggest that this represents a continuation of what they call ‘sensory power’ deployed well before the pandemic, that is, the use of technology to ‘sense’, track, surveille, and ultimately produce subjects (2020, 1-2). Accordingly the use of digital applications to check in to venues and assist in contact tracing during the pandemic has heightened enactment of sensory power. The authors conclude that the pandemic has involved an ‘acceleration’ of sensory power technologies, which deserve greater interrogation given their often entwinement with the interests of capital (Isin and Ruppert 2020, 11).

However just as visuals have been key to communicating health information, this has also been an avenue through which disinformation has been spread. Research suggests that visuals can be misused to emphasise some information while omitting other facts, can give a false sense of evidence, and can be used to deceive viewers that the information is from an authoritative source (Brennen, Simon, and Nielsen 2021). The issue is not simply what visuals can misrepresent, but how images can work to shape and frame the social in powerful ways (Brennen, Simon, and Nielsen 2021) .

Visuals have been used positively during the pandemic to tell stories about experiences and life navigating COVID-19. Comic representation has been key here, allowing insight – for example – into clinical spaces and the experiences of health

care workers during difficult times (Callender et al 2020). Comics can provide competing narratives and viewpoints, allowing for exploration of ‘...conflicting attitudes and emotions inherent in caring for the sick during this pandemic’ (Callender et al 2020, 1062). The use of visual medium to tell personal stories about the pandemic not only allows insight into otherwise unseen spaces, but also helps to build a sense of understanding and solidarity (Callender et al 2020).

More technically, the graphic representation of rules and regulations relating to COVID-19 restrictions has also become a key feature of daily life for communities affected across the world. From marks on the floor designating appropriate social distance requirements, to QR check-in codes, to signs imploring mask-use, density limits and vaccination requirements, venturing outside one’s home during the pandemic has come with constant visual reminders of the broader crisis. In periods or contexts where mask wearing has been mandated, this has also acted as a reminder for many of the threat of the virus (Lupton et al 2021, xiii). The rules associated with periods of the pandemic (such as lockdown/stay at home orders) have also radically shifted the appearance and ‘affective atmospheres’ of daily life, especially in cityscapes (Young 2021). During these times, the typical convolution of public space has instead become sparse, a visual absence of bodies on streets, in airports, and other ordinarily crowded venues.

In terms of navigating public space, daily life in the pandemic has involved constant risk assessment, and visual cues have played a key role for many individuals. Sight is the sense that people rely on to the greatest extent to assess the risk of someone else being infectious, followed by sound (Ackerman, Merrell, and Choi 2020), and some studies do suggest that pathogen detection may be more likely through using visual cues (see for example Axelsson et al. 2018). Reliance on these senses may be

because assessment can occur at a seemingly safe distance (Ackerman, Merrell, and Choi 2020). The biases that may be involved in this, in terms of how visual assessment of infection risk intersects with issues like gender, race and class, are yet to be explored.

Finally, of course, we must reckon with the visual language used to represent the virus and its impacts. The familiar image of the virus was a digital representation put together by two medical illustrators, Alissa Eckert and Dan Higgins, using computer software. Where transmission electron micrograph images of COVID particles in and among cells emphasised their integration with biological life, the isolated ‘beauty shot’ of the virus against a clear background emphasised the disease as something outside of the body to be ejected, quarantined from, and destroyed (Hattam, 2020). Whilst viruses exist in a world of grey, the images of the virus were often colourised in ways that highlighted its menacing properties, emphasised its spikey-ness, and was widely re-used on news websites and in government public health messaging (Delicado and Rowland, 2021). The ubiquity of images of the virus with its central ball and spikey, tactile, corona often emphasised that the pandemic was a biological, natural, and neutral phenomena. By extension it de-emphasised the social, political, qualities of the virus and the unevenness of risk to which different members of the public were exposed (Candela, 2021).

Sound

Along with sparse city streets, one of the most noticeable elements of the lockdowns has been the shifting soundscape. Numerous projects have emerged to track the sounds of the pandemic (Fowkes 2020; Radio Aporee 2020). Some sounds disappeared: social-distancing emptied belfries of their ringers and silenced the bells of churches (Parker and Spennemann 2020). The sounds that survived, such as the calls of

street sellers in Indian cities, gave people a sense of connection to the pre-pandemic past (Bhattacharjee 2021). The provision of artificial crowd-noise pumped into stadia or added to televised sport provided another way of maintaining auditory composure in the face of the pandemic (Heydon 2021).

But the pandemic also offered a space for new sounds to stake their claim on the public's ears. In some locked-down cities the Muslim call to prayer, *adhan*, was publicly broadcast for the first time during Ramadan (Riskedahl 2020). As traffic-noise abated birds filled the acoustic vacuum with their song (Derryberry et al 2020). The anthropause's acoustic impacts could be felt in the sea as well as the air, with research suggesting that fish and other marine life-forms benefited from the reduction in road and boat noise (Basan, Fischer, and Kühnel 2021). However, the loss of many human-created sounds has been a potent reminder of the need to identify, collect, and preserve heritage sounds that might be lost as a result of curfews, lockdowns, or other future restrictive forms of legislation mobilised against sound (Spennemann and Parker 2020).

Such legislation seems relatively likely. Shifts in historical soundscapes have often encouraged a re-ordering of sensitivities that have resulted in campaigns against sounds re-categorised as 'noise' (Bjisterfeld 2008). As many public spaces became less noisy in lockdown, people often became more sensitive to their acoustic environments. The tone of noise complaints shifted. Complaints about neighbourhood noise increased substantially (Tong et al 2021). Evidence also suggests that people became more sensitive to traffic noise as its rhythms changed (Bartalucci et al 2021). More white-collar workers and professionals worked from home during lockdowns, reversing historical trends towards separating the workplace and home. In this context worries about the impact of neighbourhood noise on 'thinking' jobs, that have a long history (Picker 2003), seem to have reappeared (Lee and Jeong 2021).

However, many ears were also sensitive to diagnostic sounds and shifting rhythms that signalled the presence or increased impact of the COVID-19 virus. Rather like the constant tolling of funeral bells that unnerved seventeenth-century Londoners during plague outbreaks (Wilson 1995), New-Yorkers complained about the constant sound of ambulances that dominated a ‘city of sirens’ (Kalaf 2020, n.p). The virus’ spread had a distinctive sound. In the UK the government rolled out a 'Test and Trace' application for mobile phones that would alert users if they had come into contact with somebody who had tested positive for COVID-19. Rocketing infection rates in July 2021 produced a corresponding surge in mobile phone alerts, producing a so-called 'pingdemic' (Rimmer 2021, n.p). The audio-tactility of being 'pinged' drew its power from a nested series of historical meanings that included ricocheting bullets, faulty car engines, the echo of sonar, and the communications culture unleashed by the internet (Zimmer 2021). The ping was therefore the sound of the virus’ attack, an external sign of internal trouble within bodies, and a marker of the constant vigilance required in public space. The heightened attention to the boundaries of the body and its biopolitical regulation were highly mediated by sound. Coughing quickly became the acoustic signature of the infected body. Public coughing bore the weight of a long history of fraught anxieties about undisciplined bodies and the regulation of bodily atmospheres in public spaces (Brown et al 2021; Scott 2021). These fears were often linked to racist abuse and nationalistic finger-pointing (Aratani 2020).

The pandemic’s shifting soundscapes were linked to the body-politic as well as the body-corporeal. Both government-mandated silence – in the form of curfews, quarantines, and lockdowns – and the state-sponsored sounds that filled the empty acoustic space – from clapping to sirens, whistles, and loudspeakers – drew attention to the importance of sonic governmentality (Zhang and Chow 2021). In many

countries lockdowns played host to a daily ritual that involved gathering on the street at an appointed time in order to clap (and make other forms of sound) in order to express gratitude for the work done by health-workers. For governments and many media outlets, these daily performances quickly became symbols of the patriotic solidarity of a national community against the virus: ‘the clapping of hands incrementally replaced the clap of the bell as the nation’s sonic stamp’ (James and Valluvan 2020, 1246).

However, as with other secular soundings such as the commemorative minute’s silence (Lichau 2019), the daily clapping was an emotional practice that both intensified and created a range of emotions for those involved. Gratitude and pride were joined by feelings of compassion, anger, and a sense of injustice at both the treatment of medical staff and the inequalities that the pandemic had revealed and exacerbated (Rigal and Joseph-Goteiner 2021; Wood 2020).

Conclusion

Traversing the literature produced so far on the sensate dimensions of the pandemic offers rich ground for understanding the embodied ruptures of COVID-19 beyond the virus itself. Returning to Smith’s contention that the pandemic has yielded a ‘sensory revolution’, we suggest that there have been many shifts our sensory environments. However, these have often been subtle and potentially short-lived. Changes to how daily life under the pandemic looks, tastes, smells, sounds and feels have ranged from the profound (empty cities) to the more minor (the smell of one’s breath in a mask). Whilst changes in our sensory landscapes have undoubtedly taken place, it is unclear whether they have promoted a concomitant shift in our perceptual habits and forms of sensory attention.

One change that is clear is that that pandemic has often promoted a shift in the relationship between the ‘distance’ senses of sight or hearing and the senses most often

associated with ‘proximity’ – touch, taste, and smell. Previous work in the history and anthropology of the senses has suggested that major political or social upheavals can alter the degree of discursive emphasis placed on particular senses: for example the idea that in contexts where social boundaries have become confused, the proximate senses have been emphasised over ‘distance’ senses (Howes and Lalonde, 1991). It could be said that the increased importance of online audio-visual environments during the pandemic has promoted a similar discursive re-ordering.

The pandemic has amplified our awareness of the senses and the many things we may have taken for granted: felt acutely for example via the loss of smell and taste experienced by many COVID-19 patients, or due to the touch hunger resulting from social distancing measures. Our sensory landscapes have changed in unexpected ways – from empty cities to altered soundscapes – illuminating the daily sensory experiences which might otherwise go unnoticed. COVID-19 has also revealed vast and pre-existing sensory inequalities. From air quality to food insecurity, the uneven way populations have been affected by COVID-19 is revelatory of racial, economic and geographic inequities in place long before 2020.

In the same way, the pandemic has accelerated sensory-related technologies and shifts already in development. From platforms and devices to facilitate digital rather than physical encounters, to the intensification of sensory power through the use of tracking, COVID-19 has radically forwarded and made commonplace technologies related to the senses. Questions remain about what changes will endure, particularly as opening up strategies mean a shift back to the public from the private domestic sphere. As people and cars return to streets, planes to the sky, restaurants reopen, and families reunite, it is unclear to what extent some of the shifts in everyday sensory experience will be discarded or forgotten.

Many aspects of sensory experience during the pandemic have revolved around loss – the loss of smell and taste for those suffering from COVID, the loss of the touch of friends and family due to social distancing, the quietening of town and city centres during lockdowns, and the shortages of food induced by supply chain disruption and panic buying. For many these experiences have been the temporary product of the pandemic. However, several of them – sensory distortion and deprivation or food insecurity for example – have been and will continue to be a daily reality for those at the sharp end of global inequalities before and after the pandemic. Others, such as the decline of air and motor traffic and the corresponding diminution in olfactory and auditory pollution, are indicative of the changes in our sensory environments that may be required if we are to forestall the climate catastrophe currently facing the planet. The fate of the sensory absences that have been characteristic of the pandemic will therefore be tied up with other temporally and geographically wide-ranging processes.

What we fear might endure are the more alienating aspects of interpersonal sensory surveillance introduced during COVID-19, and the deepening of inequalities discussed here particularly given the uneven distribution of and access to vaccines across the globe. What we hope will live-on is the revelatory awareness of the importance of the sensate which the pandemic has bestowed, from the desire and importance of touch to the power of the visual to build solidarity in difficult times. Rather than focusing on ‘crises’ of the senses, we suggest that going forward sensory scholars might best be placed to turn their attention to questions of inequality and revolutionary rebounds as we begin to come to terms with medium- and longer-term impacts of the pandemic on the world of the senses.

The authors would like to thank XXX who provided XXX grant to support the research that underpinned this project.

References

- Ackerman, Joshua M., Merrell, Wilson N., and Soyeon Choi. 2020. "What people believe about detecting infectious disease using the senses." *Current Research in Ecological and Social Psychology* 1 doi: 10.1016/j.cresp.2020.100002
- Allen, Louisa. 2021. "The smell of lockdown: Smellwalks as sensuous methodology." *Qualitative Research* doi: 10.1177/14687941211007663
- Aratani, Lauren. 2020. "'Coughing while Asian': living in fear as racism feeds of coronavirus panic." *The Guardian*, March 25. Accessed 29 October 2021. <https://www.theguardian.com/world/2020/mar/24/coronavirus-us-asian-americans-racism>
- Armstrong, Beth. 2021. "Food insecurity, food waste, food behaviours and cooking confidence of UK citizens at the start of the COVID-19 lockdown." *British Food Journal* 123 (9): 2959-2978
- Arradondo, Briona. 2021. "Hillsborough tap water may taste, smell different due to coronavirus pandemic." *Fox 13 Tampa Bay*, August 25. Accessed 28 October 2021. <https://www.fox13news.com/news/your-water-may-taste-smell-different-due-to-coronavirus-pandemic>
- Axelsson, J., Sundelin, T., Olsson, M.J., Sorjonen, K., Axelsson, C., Lasselin, J. and Lekander, M. 2018. "Identification of acutely sick people and facial cues of sickness." *Proceedings of the Royal Society B: Biological Sciences* 285, Article 20172430
- Barnes, David. 2005. "Confronting Sensory Crisis in the great Stinks of London and Paris". In *Filth: Dirt, Disgust and Modern Life*, edited by William A. Cohen and Ryan, 103-129. Minneapolis: University of Minnesota Press
- Bartalucci, Chiara, Bellomini, Raffaella, Luzzi, Sergio, Pulella, Paola, and Torelli, Giulia. 2021. "A survey on the soundscape perception before and during the COVID-19 pandemic in Italy." *Noise Mapping* 8(1): 65-88
- Basan, Fritjof, Fischer, Jens-Georg, and Kühnel, Dennis. 2021. "Soundscapes in the German Baltic Sea Before and During the COVID-19 Pandemic." *Frontiers in Marine Science* 8, 689860
- Bhattacharjee, Manas Firaq. 2021. *The Town Slowly Empties: On Life and Culture During Lockdown*. Headpress.
- Bjsterveld, Karin. 2008. *Mechanical Sound: Technology, Culture, and Public Problems of Noise in the Twentieth Century*. MIT Press.
- Brennen, J. Scott, Simon, Felix M., and Nielsen, Rasmus Kleis. 2021. "Beyond (Mis)Representation: Visuals in COVID-19 Misinformation." *The International Journal of Press/Politics* 26 (1): 277-299

Brown, Nik, Nettleton, Sarah, Buse, Chrissy, Lewis, Alan, and Martin, Daryl. 2021. "The coughing body: etiquettes, techniques, sonographies and spaces." *BioSocieties* 16: 270-288.

Callender, Brian, Obuobi, Shirlene, Czerwiec, M. K., and Williams, Ian. 2020. "COVID-19, comics, and the visual culture of contagion." *The Lancet* doi: 10.1016/S0140-6736(20)32084-5

Candela, Candela. 2021. "Designing the Virus." *Historical Studies in the Natural Sciences*, 51 (1): 140-145.

Corbin, Alain. 1986. *The Foul and the Fragrant: Odor and the French Social Imagination*. London, Harvard University Press.

Cox, Kimberly. 2021. *Touch, Sexuality, and Hands in British Literature, 1740–1901*. London, Routledge

Danius, Sara. 2002. *The Senses of Modernism Technology, Perception, and Aesthetics*. Ithica: Cornell University Press.

Dau, Duc and Gagné, Ann. 2020. "Touching the Untouchable: Connecting, Ethical Caring, and Teaching During COVID-19." *MAI: Feminism & Visual Culture* <https://maifeminism.com/touching-the-untouchable-connecting-ethical-caring-and-teaching-during-covid-19/>

Delicado, Ana, Rowland, Jussara. 2021. "Visual Representations of Science in a Pandemic: COVID-19 in Images", *Frontiers in Communication*, 6:645725, doi:10.3389/fcomm.2021.645725

Derryberry, Elizabeth P., Phillips, Jennifer Nicole, Derryberry, Graham E., and Blum, Michael J. 2020. "Singing in a silence spring: Birds respond to a half-century soundscape reversion during the COVID-19 shutdown." *Science* 370 (6516): 575-579

Dey, Ishita. 2020. "Social Distancing, 'Touch-Me-Not' and the Migrant Worker, in Ranabir Samaddar." In Calcutta Research Group, *Borders of an Epidemic: COVID-19 and Migrant Workers*. Ebook, 98-103

Doron, Assa. 2020. "Stench and sensibilities: On living with waste, animals and microbes in India." *The Australian Journal of Anthropology* 32 (1): 23-41

Drobnick, Jim. 2005. "Volatile Effects: Olfactory Dimensions of Art and Architecture." In David Howes (ed), *Empire of the Senses*. Oxford, Berg, 265-280

Easterbrook-Smith, Gwyn. 2021. "By Bread Alone: Baking as Leisure, Performance, Sustenance, During the COVID-19 Crisis." *Leisure Sciences* 43 (1-2): 36-42

Elswit, Kate. 2021. "Reflections on bodies in lockdown: The coronasphere." *Multimodality and Society* 1 (1): 69-74

- Faria, Sandro Felipe Santos. 2021. "Self-perceived and self-reported breath odour and the wearing of face masks during the COVID-19 pandemic." *Oral Diseases* doi: 10.1111/odi.13958
- Feldman, Jessica. 2020. "Listening and Falling Silent: Towards *Technics* of Collectivity." *Sociologica* 14 (2): 5-12
- Fowkes, Stuart. 2020. "#StayHomeSounds Sounds from the global Covid-19 lockdown." Accessed 29 October 2021 <https://citiesandmemory.com/covid19-sounds/>
- Gerke, Barbara. 2020. "Thinking through complex webs of potency." *Medicine Anthropology Theory* 7 (1): 188-209
- Gilman, Sander L., and Zhou, Xiun. 2021. *I Know Who Caused COVID-19', Pandemics and Xenophobia*. London, Reaktion
- Goeltzenleuchter, Brian. 2021. "Scents of Exile." Olfactory Art Keller. Accessed 8 October 2021 <https://www.olfactoryartkeller.com/exhibitions/scents-of-exile>
- Hakimi, Amir A, and Armstrong, William. B. 2020. "Hand Sanitizer in a Pandemic: Wrong Formulations in the Wrong Hands." *The Journal of Emergency Medicine* 60 (5): 682-683
- Harms, Arne. 2020. "Fortifying breath in this moment of spray: face masks beyond COVID-19." *Social Anthropology* doi: 10.1111/1469-8676.12858
- Hattam, Victoria. 2020. "Visualizing the Virus." *Design and Culture*, 13 (2): 9-17.
- Heydon, Jeff. 2021. "Canned Reactions and FIFA Noise: The Specter of the Audience During a Pandemic." *MAST* 2 (1): 133-150
- Hsuan, Hsu. 2020. *The Smell of Risk Environmental Disparities and Olfactory Aesthetics*. New York, New York University Press
- Hoover, Kara C. 2018. "Sensory disruption in modern living and the emergence of sensory inequities." *Yale Journal of Biological Medicine* 91 (1): 53-62
- Hoover, Kara C. 2021. "Sensory disruption and sensory inequities in the Anthropocene." *Evolutionary Anthropology* 30 (2): 128-140
- Howes, David, and Lalonde, Marc. 1991. "The History of Sensibilities: Of the Standard of Taste in Mid-Eighteenth-Century England and the Circulation of Smells in Post-Revolutionary France." *Dialectical Anthropology* 16 (2): 125-135.
- James, Malcolm, and Valluvan, Sivamohan. 2020. "Coronavirus Conjuncture: Nationalism and Pandemic States." *Sociology* 54 (6): 1238-1250
- Inin, Engin and Ruppert, Evelyn. 2020. "The birth of sensory power: How a pandemic made it visible?" *Big Data and Society* July-December: 1-15 doi: 10.1177/2053951720969208

- Janssen, Mark, Chang Betty P. I., Hristov, Hristo, Pravst, Igor, Profeta, Adriano, and Millard, Jeremy. 2021. "Changes in Food Consumption During the COVID-19 Pandemic: Analysis of Consumer Survey Data from the First Lockdown Period in Denmark, Germany, and Slovenia." *Frontiers in Nutrition* 8: 635859
- Kahn-Harris, Keith. 2020. "Beyond Sound and Vision." *RSA Journal* 166 (2): 38-40
- Kalaf, Samer. 2020. "Alone in the City of Sirens." *The New Republic*, 10 April. Accessed 29 October 2021 <https://newrepublic.com/article/157256/coronavirus-new-york-city-sirens>
- Kassell, Lauren. 2021. "Going Nowhere: Routines in a Pandemic." *PMLA* 136 (2): 310-316
- Kirksey, Eric. 2020. "The Emergence of COVID-19: A Multispecies Story." *Anthropology Now* 12 (1): 11-16
- Lee, Pyoung Jik, and Jeong, Jeong Ho. 2021. "Attitudes towards outdoor and neighbour noise during the COVID-19 lockdown: A case study in London." *Sustainable Cities and Society* 67: 102768
- Lichau, Kirsten. 2019. "Secularizing Silent Bodies: Emotional Practices in the Minute's Silence." In Monique Scheer et al. (eds.), *Secular Bodies, Affects and Emotions: European Configurations*. Bloomsbury, 141-156
- Liebelt, Claudia. 2020. "Celebrating the Feast of Sweet Smells and Tastes during Corona times." *Cultures of Hygiene* <https://culthygiene.hypotheses.org/126>
- Lupton, Deborah, Southerton, Clare, Clark, Marianne and Watson, Ash. 2021. *The face mask in COVID times: a sociomaterial analysis*. Berlin: De Gruyter
- Marty, Lucile, de Lauzon-Guillain, Blandine, Labesse, Maë, and Nicklaus, Sophie. 2021. "Food choice motives and the nutritional quality of diet during the COVID-19 lockdown in France." *Appetite* 157: 105005
- Nguyen, Terry. 2020. "Dalgona coffee, PowerPoint parties, and bread baking: The micro-trends of quarantine." *Vox*, April 7. Accessed 28 October 2021. <https://www.vox.com/the-goods/2020/4/7/21207127/things-to-do-during-quarantine-dalgona-coffee-bread-baking-trends>
- Norton, Inês. 2021. "Reflections on bodies in lockdown: Notes on new mappings of tactility." *Multimodality and Society* 1 (1): 75-80
- Otto, Cynthia M, Sell, T. K., Veenema, T., Hosangadi, D., Vahey, R. A., Connell, N. D., and Privor-Dumm, L. 2021. "The Promise of Disease Detection Dogs in Pandemic Response: Lessons Learned From COVID-19." *Disaster Medicine and Public Health Preparedness* 1-6 doi: 10.1017/dmp.2021.183

- Parker, Murray, and Spennemann, Dirk H. R. 2021. "Stille Nacht: COVID and the Ghost of Christmas 2020." *Heritage* 4 (4): 3081-3097
- Parker, Murray, and Spennemann, Dirk H. R. 2020. "Anthropause on audio: The effects of the COVID-19 pandemic on church bell ringing and associated soundscapes in New South Wales (Australia)." *The Journal of the Acoustical Society of America* 148 (5): 3102-3106
- Parker, Jane K., Kelly, Christine E., Smith, Barry, Hopkins, Claire, and Gane, Simon B. 2021. "An analysis of patients' perspectives on qualitative olfactory dysfunction using social media." *medRxiv* 2020.12.30.20249029 doi: 10.1101/2020.12.30.20249029
- Picker, John. 2003. *Victorian Soundscapes*. Oxford University Press.
- Radio Aporee. 2020. "Soundscapes in the Pandemic." Accessed 29 October 2021 <https://aporee.org/maps/work/projects.php?project=corona>
- Rigal, Alexander and Joseph-Goteiner, David. 2021. "The Globalization of an Interaction Ritual Chain: 'Clapping for Carers' During the Conflict Against COVID-19." *Sociology of Religion* doi: 10.1093/socrel/srab044
- Rimmer, Abi. 2021. "Sixty seconds on... the pingdemic", *BMJ* 374(1822), doi: 10.1136/bmj.n1822
- Risdekhal, Diane. 2020. "The Muslim Call to Prayer in Canada's Pandemic Soundscape." *City and Society* 32 (2) doi: 10.1111/CISO.12304
- Rume, Tanjena, and Didar-Ul Islamb, S.M. 2020. "Environmental effects of COVID-19 pandemic and potential strategies of sustainability." *Heliyon* 6 (9): e04965
- Hamaguchi, Ryoko, Nematollahi, Saman and Minter, Daniel J. 2020. "Picture of a pandemic: visual aids in the COVID-19 crisis." *Journal of Public Health* 42 (3): 483–485
- Satyogi, Pooja. 2021. "Perverse Economies of Intimate and Personal Labour: Resuming Domestic Work in Households after the Lockdown." *Anthropology in Action* 28 (1): 39-46
- Scott, Sarah Mayberry. 2021. "Sonic Lessons of the COVID-19 Soundscape." *Sounding Out*, August 2. Accessed 29 October 2021 <https://soundstudiesblog.com/2021/08/02/sonic-lessons-of-the-covid-19-soundscape/>
- Sear, Cynthia. 2020. "Porous Bodies." *Anthropology in Action* 27 (2): 73-77
- Sen, Shreya and Samanta, Tannistha. 2020. "Middle-Classness, Delivered: Sociological Reflections on Fast-Food During the Pandemic." In *Solidarity and Care During the COVID-19 Pandemic*. Accessed 28 October 2021 <https://www.solidarityandcare.org/stories/essays/middle-classness-delivered-sociological-reflections-on-fast-food-during-the-pandemic>

Sigley, Isobel. 2020. "It has touched us all: Commentary on the social implications of touch during the COVID-19 pandemic." *Social Sciences and Humanities Open* 2 (1): 100051

Smith, Mark. 2020. "Welcome to your sensory revolution, thanks to the pandemic." *The Conversation*, April 27. Accessed 7 November 2021
<https://theconversation.com/welcome-to-your-sensory-revolution-thanks-to-the-pandemic-136321>

Spence, Charles, Youssef, Jozef, and Levitan, Carmel A. 2021. "Delivering the Multisensory Experience of Dining-Out, for Those Dining-In, During the Covid Pandemic." *Frontiers in Psychology* 12: 683569 doi: 10.3389/fpsyg.2021.683569

Spackman, Christy and Burlingame, Gary A. 2018. "Sensory politics: The tug-of-war between potability and palatability in municipal water production." *Social Studies of Science* 48 (3): 350-371

Spennemann, Dirk H. R, and Parker, Murray. 2020. "Hitting the 'pause' button: What does COVID-19 tell us about the future of heritage sounds?" *Noise Mapping* 7 (1): 265-275

Steinemann, Anne, Nematollahi, Neda, Rismanchi, Behzad, Goodman, Nigel, Kolev, Spas D. 2021. "Pandemic products and volatile chemical emissions." *Air Quality, Atmosphere & Health* 14: 47-53

Stone, Will. 2020. "Tear-Gassing Protesters During An Infectious Outbreak Called 'A Recipe For Disaster'." *NPR*, June 5. Accessed 30 October 2021
<https://www.npr.org/sections/health-shots/2020/06/05/870144402/tear-gassing-protesters-during-an-infectious-outbreak-called-a-recipe-for-disast.?t=1635524364882&t=1635600325606>

Thomas, Patricia A and Kim, Seoyoun. 2021. "Lost Touch? Implications of Physical Touch for Physical Health." *The Journals of Gerontology* 76 (3): e111–e115

Tong, Huan, Aletta, Francesco, Mitchell, Andrew, Oberman, Tin, and Kang, Jian. 2021. "Increases in noise complaints during the COVID-19 lockdown in Spring 2020: A case study in Greater London, UK." *Science of the Total Environment* 785: 147213

Tracy, Megan. 2020. "Heritage hands and tastes of the pandemic." *International Journal of Cultural Property* 27 (4): 481-488

Travaglio, Marco, Yu, Yizhou, Popovic, Rebeka, Selley, Liza, Santos Leal, Nuno, and Martins Luis Miguel. 2021. "Links between air pollution and COVID-19 in England." *Environmental Pollution* 268(A): 115859

Valinsky, Jordan. 2021. "Wendy's is upgrading its french fries." *CNN*, August 26. Accessed 28 October 2021 <https://edition.cnn.com/2021/08/26/business/wendys-new-french-fries/index.html>

- Valley, Mickey. 2021. "COVID-19 & Touch." In *Solidarity and Care During the COVID-19 Pandemic* <https://www.solidarityandcare.org/stories/essays/covid-19-touch>
- Van der Vlugt, Marloeke. 2021. "Reflections on bodies in lockdown: The polyphony of touch." *Multimodality and Society* 1 (1): 81-87
- Vannini, Phillip. 2020. "COVID-19 as Atmospheric Dis-ease: Attuning into Ordinary Effects of Collective Quarantine and Isolation." *Space and Culture* 23 (3): 269–273
- Watson, Ashley, Lupton, Deborah, and Michael, Mike. 2021. "Enacting intimacy and sociality at a distance in the COVID-19 crisis: the sociomaterialities of home-based communication technologies." *Media International Australia* 178 (1): 136-150
- Williams, Joshua. 2021. "The Smell." *Theatre Topics* 31 (2): 195-198
- Wilson, Eric. 1995. "Plagues, Fairs, and Street Cries: Sounding out Society and Space in Early Modern London." *Modern Language Studies* 25 (3): 1-42
- Young, Alison. 2021. "The Limits of the City: Atmospheres of Lockdown." *British Journal of Criminology* azab001 doi: 10.1093/bjc/azab001
- Younge, Gary. 2020. "We can't breathe." *New Statesman*, June 3. Accessed 30 October 2021 <https://www.newstatesman.com/uncategorized/2020/06/we-cant-breathe>
- Zeng, Zhanjing, Chen, Po-Ju, and Lew, Alan A. 2020. "From high-touch to high-tech: COVID-19 drives robotics adoption." *Tourism Geographies* 22 (3): 724-734
- Zhang, Qian and Chow, Yiu Fair. 2021. "COVID-19 and sonic governmentality: Can we hear the virus speak?" *China Information* doi: 10.1177/0920203X211009417
- Zimmer, Ben. 2021. "'Ping': The Sound of Alarm, From Muskets to Pandemics." *Wall Street Journal*, August 5. Accessed 30 October 2021 <https://www.wsj.com/articles/ping-the-sound-of-alarm-from-muskets-to-pandemics-11628204796>