Un/making the 'sensory home': tastes, smells and sounds during disasters

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Abstract

In this paper, we develop the notion of the 'sensory home'. We reveal how gustatory, olfactory and sonic experiences shape where and when one feels 'at home'. We draw on a qualitative, longitudinal methodology to explore how low-income Puerto Ricans experienced domestic tastescapes, smellscapes and soundscapes during the first 12 months after Hurricane Maria in 2017. We first show how the sensory home is made with familiar and routine sensory experiences, and unmade by intrusive and unfamiliar tastes, smells and sounds. Second, the sensory home is temporally dynamic as it is constituted by processes taking place on multiple scales and by multiple actors – particularly the state and neighbourhood. Thus, un/making the sensory home is inherently political as it is tied to state-citizen power relations – our third contribution. Finally, in disasters people asymmetrically recover not just economically or materially, but as we show, sensorially.

Key words: home, ethnography, disasters, taste, smell, sound, Puerto Rico

Introduction

The senses are integral to how humans perceive and experience place (Ashworth 2017). Senses can mediate the emotional and affective relationships that comprise place, informing not only how to move, but also increasing or decreasing the capacity to act. In this paper, we explore how everyday sensorial experiences offer new insights into geographies of home un/making. Theories on the sensory components of home are present in a small number of studies (Abdullah 2016; Brickell, 2012; Petridou 2001; Pink 2007; Classen, 2010; Sutton, 2001; Gasparetti, 2009). Our paper builds on this work by bringing notions of sensescapes and home into conversation with one another, within a disaster context. In doing so we

empirically and theoretically argue that home is not only made and unmade through the material and imaginative (Blunt and Dowling, 2004), but also through the experiential practices of the senses.

Our study supplements the small set of sensorial research in the region of home cultures, where although the sense of sight is prevalent (Miller, 2001; Hutmacher, 2019), research on taste, smell and sound remains in a nascent stage (Pink, 2020). We build upon both Stoller's call for a 'sensuous scholarship' that ‘takes seriously the fact that we are engaged with all our senses in the production (and destruction) of social life’ (1997: 35), and Ross’ call ‘to take seriously the ways that we engage in and with space/place, filling it with activity, relations, sensual engagements, interpretive activity, emotions and experience over time’ (2004: 41).

Data is drawn from a one-year study that explored how low-income Puerto Rican households recovered following the impact of Hurricane Maria, which devastated the Caribbean Island in September 2017. We discovered that the material and imaginative elements of home are unmade and remade following a major disaster (see Sou and Webber 2019). Yet, during this research it became clear, both in the narrative of home that emerged from the interviews, and the lead author’s experiences of the homes she visited, that the changing sensory landscape formed a crucial part of how the disaster was experienced. Considering this, we focus on the transformation of the ubiquitous multisensorial social realities of everyday domestic life - sound, smell and taste – and their constitution of the sensory home.

We first reveal how the rhythmic affordances of sound, smell and taste shape where and when one feels at home. We also reveal how the sensory home is constituted by processes taking place on multiple scales and by multiple actors – particularly the state and neighbourhood. This allows us to empirically and theoretically demonstrate how the un/making of the sensory home is inherently political and tied to state-citizen power relations. We also highlight how residents mobilise their agency to unequally mitigate and adapt to changing societal conditions to recover and take control of their domestic sensescapes. Our

longitudinal methodology also allows us to reveal the temporality of the sensorial home. That is, people's perceptions, experiences, and control of domestic sensescapes oscillate, because they are intimately shaped by the (changing) actions of actors beyond the household.

Our paper is divided into four sections. The first section presents a discussion of the existing literature on home unmaking and domestic sensescapes. Next, we outline the case site and methods used. The empirical sections delve into the transformation of three domestic senses following hurricane Maria: taste, smell, and sound. The fourth section offers conclusions for home cultures and disaster studies.

Aromas, acoustics and flavours of home

'Home' is usually associated with 'a material and an affective space, real or imagined, that is generally formative of personal and national identity, shaped by everyday practices, lived experiences, social relations, memories and emotions' (Peil, 2009: 180). A home provides not just shelter, but ontological security—a place that secures and underpins a sense of self-identity and agency (Brun and Lund, 2008)[i]. Yet homes require inhabitants to exercise their agency and bring 'some space under control' (Douglas, 1991: 289). Therefore, a home is not static, materially or meaningfully, but rather is a process, requiring work (Visser, 2019). Home and its meaning are actively made through the everyday activities and routines undertaken to establish and articulate home, such as cooking, cleaning, relaxing, and eating with family. However, the ability of inhabitants to engage in homemaking activities depends on the behaviour and decisions of multiple actors located at multiple scales beyond the household, such as the street, the neighbourhood, the nation and even the globe. This is because the 'home is not separated from public, political worlds but is constituted through them: the domestic is created through the extra-domestic and vice versa' (Blunt and Dowling, 2006: 27). This makes the home vulnerable to political-economic policies (van Lanen, 2020), further highlighting the intertwining of different scales in the un/making of home.

Just as home is made, it can be 'unmade', which Baxter and Brickell (2014: 134) define as 'the precarious process by which material and/or imaginary components of home are unintentionally or deliberately, temporarily or permanently, divested, damaged or even destroyed'. Given the multi-scalarity of home, home unmaking can be the result of broader political and economic forces that transcend the physical house. For instance, Fernández Arrigoitia (2015) shows how neoliberalism ultimately leads to perhaps one of the most tangible forms of home unmaking - demolition - or the threat of it, in poor neighbourhoods of San Juan, Puerto Rico. Relatedly, she reveals how the condition of materials and infrastructures on the very cusp of home e.g., lifts, staircases and streets are vital actors that can unmake the sense of home. These 'actors' intersect at different scales; thus, analytical focus here allows one to identify how home is intimately shaped by state-citizen power relations. In this sense, Fernández Arrigoitia (2015) reveals the political nature of home unmaking and how home unmaking may take place in contexts of political struggle or marginalisation.

A home is seldom a finalized endeavour, but rather a process. Most research on home un/making has focused on the materiality and activities that take place within and beyond the home. These are fundamental to any understandings of home. However, 'qualifying the home requires looking beyond its material form to consider its multifaceted sensory qualities' (Brickell, 2012: 230). Yet this remains an area which critical studies have yet to advance. Focus here will expand understandings of home un/making that beyond the tangible and visual components of the home. To approach homemaking through the lens of the visual alone is to neglect the other integral components that come to build and unmake a *sense* of home, namely, taste, sound, and smell (Classen, 2010).

A small, but important body of work in the social sciences has emphasized how domestic living is significantly shaped by the sensory experience. For example, Burrell (2014) demonstrates how excessive noise, smells and dirt from the street demonstrate a class-based inequality that manifests as negative multisensory affects. Henshaw (2011) shows how

odour has an important role to play in how home is experienced because it is retained in memory longer than visual images and can transport people back through space and time through recollection and association. Sutton utilises Fernandez' concept of 'wholeness' (1986) to explore how individuals engage the senses as a way of returning to the whole in the context of migration. At its core, the concept of 'wholeness' refers to how engaging in acts such as eating particular foods which were familiar in previous countries, as in the example of migration, can help individuals 'reintegrate the past and the present' (Sutton, 2001: 75) sensorially (see also Webber, 2018). Alterations to a locality, as opposed to departure from it, can also impact on inhabitants' sensory experience of the home. Ahmed (1999: 341) writes that 'the locality intrudes into the senses: it defines what one smells, hears, touches, feels, remembers'. Thus, when this locality is affected by disaster, so too a sense of home is disrupted. Ross's work (2004) further attends to the intertwining of the temporal and smell, how certain smells that are associated with daily routines and seasonal rhythms build a home. As such, disruptions to routines can manifest olfactorily, knocking off kilter the routines that occur within the home, or the neighbourhood more widely.

Smells and taste are closely entwined sensory experiences (Pink, 2007). Just as Ross describes the routine encounters with certain smells, Gasparetti (2009: 8) discusses the ways that dishes become traditional through their habitual consumption, by, she argues, a whole cultural group. Such dishes are then 'constructed and modelled around daily habits'. Petridou (2001) discusses the role of food in Greek migrant's attempts to recreate a sense of home and how food and familiar senses are *tools* to recover a 'wholeness' among migrant communities.

In as much as homes are permeated with smellscapes and tastescapes, they are also infused with domestic sounds that originate from within and beyond the house. A 'soundscape' is the totality of the sound environment with emphasis on the way it is perceived and understood by the individual (Axelson, 2015). It is a powerful tool that helps humans relate to their surroundings, and Duffy and Waitt (2013: 478) argue that sound is integral to how people

'make' home. In this paper our focus is on the everyday use of sound, and how sound acts to create an environment for domestic living (Tacchi, 2012), such as the creaking of floorboards, the dripping of a tap, or the TV and radio. Other examples include Ross's (2004) study of the gendered use of space in an informal settlement in the Western Cape, where she writes of how sounds, arguments and conversations within the private walls of the house often bled into the public sphere, because of the thin walls in the settlement. While the notion of soundscapes has attracted interest, (e.g., Axelson, 2015), there are relatively few examples of research investigating the soundscapes of domestic environments, despite domestic spaces being highly sonic (Pink, 2007).

As such home is not merely a material space, it is deeply sensed - smelled, tasted and heard. Ignoring the role of these senses on the experience of the home is to the detriment of developing a holistic understanding of the meaning of home. Our research synthesises critical literature on the home and on the sensory home to examine how homes can be unmade and remade, through disruption to key senses – taste, smell and sound in the current study. By adopting a longitudinal methodology and situating our research in a post-disaster context, our study reveals the temporality of the sensory home.

Ingenio, Puerto Rico

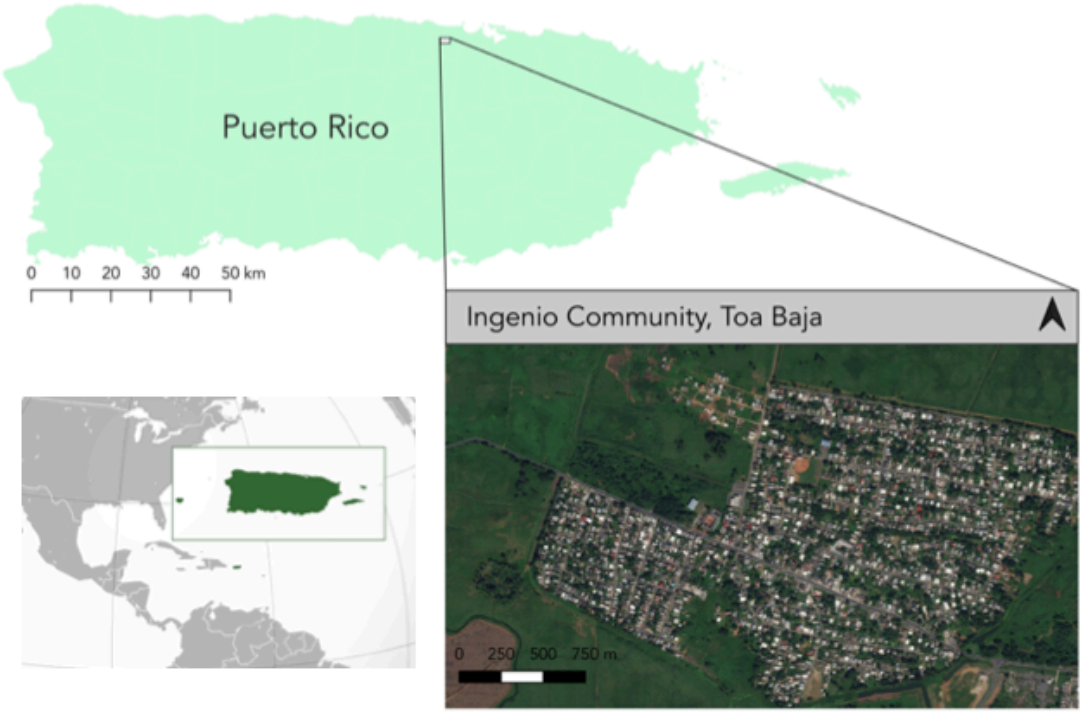
We selected the neighbourhood Ingenio as our case site; a community of approximately 4,415 persons across 1,529 households, situated in the Caribbean Island Puerto Rico (US Census Bureau, 2018) (see figure 1). Puerto Rico's status as an unincorporated territory positions the island within state governance but not as far as to be encompassed within the 50 states themselves (Rivera, 2018). This means that citizens of Puerto Rico cannot vote in US elections for Congress or the Presidency, but they are subject to the US laws and regulations passed by these bodies (Ayala and Bernabe 2009).

The island was hit by two major hurricanes in 2017 - Irma on September 7th and Maria on September 21st. These, particularly Maria, caused major devastation to the fragile infrastructure and economic activity, and economic damages were estimated USD $31.5

billion (FEMA, 2017). However, the effects of the storm are best understood as the compounded results of a long-standing colonial history (Bonilla and LeBron 2019)[ii]. Over five centuries of colonialism (first Spanish, then American) and a long history of structural vulnerability and forced dependency created the widespread poverty, unemployment and decrepit infrastructure, which enabled Maria to have such devastating impacts (Bonilla 2020). For example, Puerto Rico's weakened local government is subject to the whims of Washington's political and economic policies, which can undermine local needs. For instance, USA policies have deliberately weakened the manufacturing and agricultural sectors in Puerto Rico, which means Puerto Rico no longer produces sufficient levels of its own consumables and non-consumables reserves (Iglesias 2018; Mares, 2019) – 85% is imported from the US (Garriga-Lopez, 2020).

As such, Puerto Rican senses have also been colonised. The foods and ingredients which people taste and smell are now controlled by US regulation. Likewise, most materials, furniture, electrical and household items that compose Puerto Rican homes, and which are experienced visually and sonically are regulated by and imported from the US. All imported goods must arrive on ships from the US with US crews – a process agreed under the Jones Act. This limits international trade competition and punishes Puerto Rican consumers by making imported commodities costly, slow to arrive and limited in availability (Cortes, 2018). However, the colonialization of Puerto Rican people's senses – particularly tastes and smells - is not a contemporary phenomenon. It can be traced back to slavery and the production of sugar on the island, which speaks to a larger imperial history that transformed the geographies of taste (Mintz 1986).

Figure 1 Ingenio neighbourhood located in the Puerto Rican and regional context



Source: Google 2021

Ingenio is a peri-urban, coastal community in Toa Baja municipality, and was extensively affected by Hurricane Maria given its location in a floodplain. The settlement of low-income households in environmentally hazardous areas occurred in many places across the island and is a result of poor land-use planning coupled with low-income families who settle in risky areas as they cannot afford land prices in more geophysically secure areas (González 2015) Ingenio is 13.5 kilometres from Puerto Rico's capital, San Juan. At the time of case selection, Hurricane Maria had just hit Puerto Rico on September 21, 2017, causing major structural and water damage to most houses in Ingenio.

Methods: sensing home in Ingenio

As highlighted earlier, the findings discussed in this paper emerged unexpectedly when collecting data for another project. This project set out to understand how household disaster recovery is shaped by societal processes and household profiles. Ethnographic methods such as participant observation, repeat visits and formal and informal interviews were

adopted (O'Reilly, 2012). Access to Ingenio was made possible as one of the authors is personally known to a local government official, who introduced the author to a neighbourhood councillor. The councillor introduced her to heads of local households who were fully briefed on the project and given 48 hours to reply if they would like to participate. Data collection began on 16th October 2017 (27 days after Hurricane Maria hit) and concluded on 13th September 2018 (almost one year after the hurricane). Data were collected through five visits to Ingenio that were equally spaced throughout the period (see Table 1).

Twenty households initially participated, however this number reduced over time as five households migrated, two households withdrew, and a household composed of a single occupant passed away. In our sample, households differed by the physical damage sustained (partial or total collapse of walls, loss of roof and/or levels of flooding) and the social profile of households (e.g., number of household members; ages; gender ratio; income; number of dependents). We purposefully selected households with diverse social profiles-recognising that our sample may not represent Ingenio yet allowing us to explore how the composition of household members shape household recovery. In this paper, we focus on household head's experiences of domestic sensescapes, to avoid homogenizing the sensory experiences of household members. We recognize that the social experience of the sensory home will differ from one household member to the next, based on gender, age, and disability for example. Yet, as we focused on heads of households, we cannot speculate on this too deeply. Additionally, we exclusively interviewed women and so our findings unearth the perceptions, experiences and responses of women in particular. As such, we take heed of Fernós et al's (2018) call for more research on women in disaster contexts because their domestic work and experiences are adversely affected yet largely invisible in disaster contexts. Considering this, we suggest that further research on men and those who are not household heads would be particularly insightful.

Table 1 Longitudinal approach to data collection

Time elapsed since Hurricane Maria	Month 1	Month 3	Month 6	Month 9	Month 12
Dates of visit to field site	16th – 30th October 2017	14th – 22nd December 2017	23rd – 31st March 2018	6th – 15th June 2018	3rd – 13th September 2018
Duration of visit	15 days	9 days	9 days	10 days	11 days
Number of households interviewed	20	16	13	12	12

In depth interviews with household heads were conducted during each of the five visits. They were interviewed alone in a relaxed environment in their home. We also interviewed Toa Baja municipal government officials, national government officials, and NGOs as drew on extensive direct observation and visual data (i.e., photography and videos). Other data included informal spontaneous conversations on general matters (including recovery)– what Barbour (2014, p156) calls ‘‘incidental ethnographic encounters’’. We use pseudonyms throughout.

During data collection it became clear, both in the narrative of home that emerged from the interviews, and the first author’s experience of the homes she visited, that people’s experiences of the sensory home were being unmade and made. Conducting interviews in the homes of participants allowed people to contextualize their sensescapes and embed them in their own life experiences. This allowed us to capture ‘more than words’ (see Anderson and Jones, 2009). Resonating with Burrell (2014), as an interviewer, the lead author was shown many different objects, was offered an insight into how the participants inhabit their homes, and experienced first-hand the noises, smells, and often the tastes they spoke about and interacted with every day. As such, the lead author ‘turned up’ her senses to identify the multiple daily lived experiences of the senses, which provided another important source of data (Sunderland et al., 2012)[iii].

After Maria: changing conditions beyond the household

During the 12 months of data collection, several events and activities, which are typically observed in disaster contexts across the world, took place. Given the scope of our paper, we do not present all the transformations. Rather we centre on the changes which directly shape the unmaking and remaking of domestic sensescapes. Many of these events and activities were largely beyond the control of households, yet they directly affected participants' sensorial experience of home. In the sections that follow, we demonstrate how these changes in the environment impact how household members experienced domestic smellscapes, tastescapes and soundscapes. In structuring our analysis this way, our article advances understandings of how sensory experiences of the home are affected *over time* in post-disaster contexts. Although we present our results chronologically, we are not suggesting that the timeline of the changing events and activities in Puerto Rico are universal. For example, the distribution of relief aid may take place during different times in other contexts, or public services may be restored much earlier than in Ingenio. Nevertheless, it is the relationships between these changing events and activities on the tastes, smells and sounds associated with the home that is most interesting to us, and which can shed light in other geographical contexts.

Basic public services were severely interrupted in the immediate aftermath of Maria. Solid waste removal services collapsed and were only fully restored five weeks after the hurricane. In the interim, the streets outside houses were lined with large piles of water-damaged furniture and other items that households had discarded following the hurricane. This attracted cockroaches and rats that can spread life-threatening diseases such as leptospirosis. Finally, the power grid across Puerto Rico was severely damaged, and households in Ingenio were left without electricity for almost six months.

Actors external to the household became more prominent in the neighbourhood following the hurricane. International and domestic non-governmental humanitarian organizations (NGOs) were heavily present, handing out food and water during the initial six weeks. These groups

included well-known international organizations such as the Red Cross, as well as smaller local Puerto Rican organizations, and missionary groups that arrived from the US. Their presence had significantly scaled back by the third month after the hurricane, with only three case households receiving food and water aid at this time. By the seventh month after the hurricane, people said that food and water aid had completely ended,

> *"It was chaos. There were people from all over. Different organisations, handing out water and food. It was unbelievable, you should have seen it. Journalists and all sorts were here. But now it's all dried up, we don't see any aid now. They all left, so now we're alone". (IValeria, 41-year-old woman)*

Kinship ties, and other households within the neighbourhood were particularly active, helping households to remove debris and clean houses during the initial three weeks -a pattern observed in other parts of Puerto Rico (Villarrubia-Mendoza and Vélez-Vélez 2020). However, recovery support from neighbourhood households was minimal by the sixth week after Maria, illustrated by Clarita,

> *"At first people were helping each other, but now it's back to the way it was before Maria. People are looking after themselves now. That's how people are around here. People just keep to themselves normally – we say hello and morning, but it's not a close-knit community".*
> *(Clarita, 36-year-old woman)*

In contrast, support from kinship actors living within and beyond the neighbourhood remained prominent throughout the 12 months of research, as Andrea commented, *"We help each other as we can, you understand?... We help amongst ourselves and how we can like that… the dynamic is good".* Initially, this came in the form of cleaning houses, and collecting aid for one another. In the medium term, kinship actors provided households with financial assistance, donated furniture and access to petrol-fuelled generators that were privately bought. In the long-term, kin provided temporary shelter within Ingenio or sent remittances if

living overseas. The latter was common for many families across the island (Rodriguez-Diaz. 2018)

As previously stated, Puerto Rico is highly dependent on importing commodities which are costly and slow to arrive (Cortes, 2018). Following Hurricane Maria, foods and cooking ingredients were imported at a much lower rate during the initial six weeks after Maria, when the state focused on the import of humanitarian relief aid (Kim and Bui, 2019). Therefore, local shops were not adequately stocked, and households found it difficult to access routine food items for cooking. Furthermore, the price of food and non-consumables increased significantly between months two and six months after Hurricane Maria.

The following sections discuss how these changes in the broader context influence the unmaking and remaking of the sensory home, through the transformation and disruption of smells, tastes and sounds.

Un/making the sensory home

Divesting tastescapes: 'blandness' and the flavours of relief aid

Food is central to the sensecapes of home, given the connections between the culinary and the domestic, memory and tradition (Soaitia and McKee, 2019). Therefore, the disruption in access to routine consumables was one of the most significant ways the sensory home was transformed and divested (Baxter and Brickell, 2014). As previously explained, during the first six weeks after the hurricane, trade activities refocused to the import of humanitarian relief aid, which many complained was "*bland*", unvaried and unhealthy,

> *"We've been given a lot of food by the [humanitarian relief] organisations, and that's good, we are very grateful for that. But it's so salty, really salty, seriously. It's no good for the boys [her two young children]. (Georgia, 34-year-old woman).*

"We're sick of the ready meals they give us. I'm used to cooking with oregano, garlic. It's so bland what they give us" (Isabel, 42-year-old woman).

Disregard for the nutrition or food preferences of disaster-affected communities has been observed with relief aid in other contexts (Wentworth, 2020). However, in Puerto Rico fresh produce depleted rapidly given Puerto Rico's import dependency, lack of reserves and the shift to importing aid trade relations. These processes undermined many Puerto Rican families' abilities to supplement (or even substitute) relief aid with foods purchased from local retailers. As such, the Puerto Rican population – including families in Ingenio – were left to wait until foods began entering the island again. Thus, Ingenio residents were unable to engage in the production of familiar domestic tastescapes (and smellscapes) that contribute towards a holistic sense of home (Rabikowska, 2010; Gasparetti, 2009). The longer the import of familiar products was not prioritised, the longer households had to wait to rebuild the culinary home. Rabikowska's assertion that food 'projects the concept of 'home', understood as a state of normalcy to be regained in the face of the destabilized conditions of life on emigration' (2010: 378), is useful here. Slow state responses disrupted the wholeness (Fernandez, 1986) of home for Puerto Rican families following the hurricane, materially impacting upon families' capacities to return to this state of culinary 'normalcy'.

Between six weeks and six months after the hurricane, food began to be imported, but at a lower rate than pre-hurricane levels, given the precedence placed on importing materials needed to reconstruct homes (Kim and Bui, 2019) e.g., timber, tiles, windows, doorframes, doors, tin sheets. Local food retailers responded by increasing their prices to mitigate their losses. On average, the cost of everyday food items rose by 35% between Month 2 and 8 after the hurricane[iv]. Research on the impact of disasters on local markets remains significantly overlooked (Twigg et al., 2017). Yet, our findings suggest that market fluctuations certainly play a role in the reconstitution of the sensory home. Most notably, price inflations undermined peoples' capacity - principally women, given the gendered nature of domestic duties - to cook familiar dishes that are central to homemaking,

> *"It [the price of food] has definitely gone up, and the gas too. I said to the woman in the shop that they should not be doing this right now, when we are all working to get better, bit-by-bit after Maria. But it was no use. She said, "I have to increase prices because there is less to sell now" (Andrea, 57-year-old woman).*

However, residents did not equally experience loss of control over their tastescapes or the restoration of their gustatory sense of home. Higher-income households were able to exercise more control as they were better able to afford the inflated prices (Sou et al 2021). Therefore, members of these households enjoyed greater access to fresh ingredients and other familiar consumables than their lower-income neighbours, as Isabel commented, *"we live with my husband's social security check, but with the increase in food prices, it is not enough".* In response, some women innovated dishes by substituting ingredients for more affordable spices, vegetables or meats to recreate popular dishes as authentically as their income would allow,

> *"Asopao (a traditional Puerto Rican dish) is the dish we have here…Normally me and my mother-in-law make it on a Sunday, most of the time. For my brother's family too. Chicken, spices, ham, peppers, I use whatever vegetables I have, but it's very good with chile peppers. Sausage too…Now we're not buying all of that. We make it with peas instead because it costs a lot to get meat for eleven mouths" (Valeria, 41-year-old woman)*

A small group of seven women from across three households responded to the divestment of culinary control by collectivising and growing produce in the garden of an abandoned house,

> *"A group of us have started growing our own vegetables. Some peas, okra and green beans. We have some chickens too. Now, we are seven women from different families, and it's going very good. It's in the garden of one of the houses that was abandoned after Maria – we know they are not coming back" (Georgia, 34-year-old woman)*

Other research across Puerto Rico found similar activities (Garriga-López 2019). Disaster studies literature would perceive this form of urban agriculture as a means to mitigate and adapt to disaster impacts (Dubbeling et al., 2019). Yet, Rodríguez-Díaz (2018) suggest that these initiatives are Puerto Ricans' attempts to decolonise and regain control of their food supply. Building on this, we suggest these grassroot claims for food sovereignty also indicate Puerto Ricans' agency and desire to rebuild familiar culinary and gustatory experiences, which are central to their experiences of homeliness and serve to recover a sense of 'wholeness' (Fernandez, 1986).

In sum, we see how people's access to food and associated tastescapes in disasters is heavily beholden to the actions of the state. Yet, residents are heterogeneously able to mitigate and adapt to shortages in consumables to recover familiar domestic tastes.

Home scents: dirt and the domestic

Ross asks us to consider, 'what a representation made on the basis of scent might reveal about people's routines' (2004: 41). Drawing on this, we demonstrate how Ingenio residents' ability to maintain control over homemaking activities which generate familiar domestic smells were disrupted and temporarily replaced with intrusive smells.

Once floodwater receded many ground level houses were left with thick black mud sometimes knee high, and with walls and doors covered in black dirt. When entering the houses, the lead author was instantly met with a strong, musty and earthy smell, summed up Alondra, *"it's (the mud) disgusting, and the smell is getting worse. My neighbour said it's not sewage water, but I'm not sure. Disgusting"*. As the mud dried the smell worsened, yet families' capacity to effectively rid their houses of the dirt and smell depended on access to water, which was only available for short periods of time during the initial two months after the hurricane.

Even once houses were dried and cleaned, a smell of damp and dirt was present across many houses during the initial weeks after the hurricane. For several residents, the smell of damp did not disappear for up to six months as it took this long for the walls to dry, permeating the smellscapes of the home with unfamiliar and *"disgusting"* smells. Returning to Ross' prompt (2004), the representation of the home based on scent reveals the unmaking of home here. The normal olfactory indications of routines such as cooking were masked by the unpleasant smell of mud and dirt, leaving interviewees unable to regain familiar domestic smellscapes. The following quote, gathered six months after the hurricane, demonstrates that even where people regained some control (Douglas, 1991), the familiar smells of the home continued to be masked by the lasting effects,

> *"We've used so many bottles of bleach and we painted the walls, but you can see the mould coming through. It still smells damp, musty. I bought lots of scented candles, but now my house smells of vanilla all the time (laughs)." (Valeria, 41-year-old woman).*

People's attempts to exercise agency to mask the smell of damp and mould was undermined by the state – water supplied by the state was intermittent and unreliable for two months after the hurricane. Furthermore, there was limited opportunity for people to mitigate the pungent odour of the garbage which lined the streets for three months after the Hurricane. The garbage attracted vermin and interviewees expressed fear ("*centipedes kill us, rats pose a threat to kill us*") and disgust at the "*unsanitary*", "*unhygienic*" and "*ugly*" conditions of their neighbourhood. The smell on the street was regularly referred to by interviewees and was noticed too by the lead author when walking through the streets of Ingenio. Yet, even indoors, the intrusive and unpleasant smell of garbage 'spilled over' from the street and encroached into the private space of the house (Burrell, 2014). Some residents responded by closing the windows, but this meant that the interior temperature became uncomfortable and so many residents chose to live with the smell.

Here, we see how the physical deterioration of shared spaces and materials on the cusp of the house are key to home unmaking (Fernández Arrigoitia 2015). However, across Puerto Rico the spatio-temporal experiences of waste removal were highly differentiated along class-based lines. That is, higher income areas within the capital San Juan had their streets cleared of debris much sooner and more regularly than lower-income neighbourhoods such as Ingenio (Santiago et al 2020). As such, the state restored the domestic smellscapes more quickly in higher-income neighbourhoods than less 'economically productive' neighbhourhoods such as Ingenio. In this way, the olfactory experience of home is highly political and imbricated with state-citizen power relations (Fernández Arrigoitia 2015).

The fumes produced by petrol-fuelled generators also intruded into homes from the street level. In the absence of electricity for six months, many households adapted by purchasing generators (35% of cases) or cabling to their kin's generator when living next door (15% of cases) to assist with everyday living, such as lighting and powering washing machines, refrigerators and televisions. Indeed, an estimated 100,000 generators had been purchased by mid-November, which led many to label Puerto Rico 'generator island' (Santiago 2017). However, with the generators came sharp "*engine*" and "*industrial*" smells that suffused both the street and the domestic space, further demonstrating how the neighbourhood scale commingles in the un/making of the sensory home, which was also the case for the soundscapes of home (Blunt and Dowling, 2006, Burrell, 2014).

Sonic voids: absence and intrusion within domestic soundscapes

Smith writes that sounds are integral to place (2000). Familiar and unfamiliar intrusive sounds add to the textured environment within which people's domestic lives are lived in post-disaster contexts. Experiences of sound change over time – often being controlled by actors beyond the household – in particular neighbours' behaviours and the state's sluggish recovery of electricity.

In the medium term (months 3 – 6 after the hurricane), interviewees emphasised the silence or absence of familiar domestic sounds that are associated with leisure-based homemaking activities, such as the TV, internet and radio, which require electricity. Like waste removal services, electricity restoration lagged in many low-income urban neighbourhoods such as Ingenio, in comparison to higher income neighbourhoods (Roman et al 2019). TV and radio sound are immediate, intimate and direct, in the sonic experience of the home (Tacchi, 2012). TV and radio sound create a textured 'soundscape' in the home, within which people move around and live their daily lives. While TV and radio sound provides a background to activities, it also comprised an important homemaking activity, which, prior to the hurricane, occupied a central activity during people's spare time. Household members would congregate to spend time together, and the sound of the TV as well as household members laughter and commentary would reverberate around the house.

Some informants told us that they "*miss listening to songs on the radio"* and "*just even having the TV on in the background"*, which were integral to the creation of everyday soundscapes within the home (Baxter and Brickell, 2014). The radio itself was seen by several informants as the creator of a relaxed environment and sense of homeliness. For example, prior to the hurricane, Antonia would listen to diverse stations such as WAPA (AM), Cadena salsoul or WIOA on a regular basis for the news, music and chit chat between DJs. When talking about life before Maria, Natalia also shared, *"when I'm on my own I normally listen to the radio, while doing the cleaning or other chores"*. Personal uses and preferences of radio sound are structured both on an individualistic level, but also play a fundamental role in how people express their agency to compose the familiar and everyday soundscape of their homes (Feld, 1990). These sounds filled an "*empty*" space, so familiar that they are unremarkable, but nevertheless, function as the acoustic backdrop, which helps create a "*homely*" home.

For Eliza, her everyday domestic soundscapes comprised of sounds that originated from neighbouring households,

> *"I still sit out at the front of the house, but before [hurricane Maria], I could listen to the neighbour's radio. He would have it on most of the day and we would chat to each other about the songs or the news stories they played. We're both still out at the front of our houses most days, but of course it's not the same".*

Domestic soundscapes are not bound by the walls of an individual house but are composed of sounds located at multiple scales beyond the household. Just as actors beyond the household shape the material and imaginative home (Blunt and Dowling 2006), they also work to constitute the sonic home.

Once TV and radio sounds are viewed in the complex environment of everyday lives, they can be seen to act in many meaningful ways to create everyday soundscapes that are familiar and comforting. People's nostalgia for the sounds of TV and radio demonstrates the ways that home involves an entanglement of cultural understandings, practices, memories and sensorial affect that allow people to create a sense of home (e.g., Blunt and Dowling, 2006). Second, that soundscapes which have their origins in everyday routines and habits can be disrupted and with it, people's sense of home can be unmade (Baxter and Brickell, 2014). Although certain routines may be the same – Eliza and her neighbour sitting at the front of their houses – the impact of the hurricane and the state's weak capacity to reinstate electricity, made the sonic components of this home-based routine no longer possible. This notion of things 'not being the same' echoes Fernandez' concept of striving for 'wholeness' (1986). As residents of Ingenio sought to restore the sensory components of home, seeking to reintegrate the past and the present, 'the past provided the frame of reference to interpret the present' (van Lanen, 2020: 13). For some families, this proved challenging while a lack of electricity hindered their sonic homemaking practices.

Six months after the Hurricane, electricity was restored to Ingenio, which gave a "*morale boost*". However, households had to incur the cost of an electrician to rewire the house. As with the ability to buy fresh ingredients, inequality between households was evident in the

restoration of domestic soundscapes. Households with sufficient disposable income or household members with the skills to rewire the house were able to quickly reconnect. Whereas many lower-income households had to wait up to two months until they could afford an electrician (and sometimes a new TV or radio).

The sonic void left by TV and radio was filled with new sounds. Most notably, the invasive humming of petrol-fuelled generators that were peppered across the neighbourhood. Participants often referred to the noise of generators as "*unbearable*", and one of the "*most difficult*" aspects of post-disaster life. The lead author experienced the roar of the generators when visiting Ingenio and both interviewer and interviewees would often need to shout to be heard during interviews,

> *"Can you hear that? The neighbour on this side [indicating to the side of the house] bought a generator a few weeks ago. That goes on most of the day. We asked them if they could have it on at certain times so we could get some peace, but they won't…That's a big part of what I miss – silence, peace, quiet"* (Bianca, 24-year-old woman)

Generators shaped the neigbourhood's ambient environment. Residents experienced the generators as 'noise', in which the sound of generators provoked a sense of alienation because they were felt as disruptive to familiar soundscapes (Duffy and Waitt, 2013), or sounded out of place (Pickering and Rice, 2017). Households that purchased generators were able to control the levels of noise, and members of these households were more accepting of generator sounds than households who did not have access to generator power. Therefore, people were more tolerant of intrusive sounds that they could self-regulate (Schafer, 1993). Six of the interviewees who did not own a generator sought to bring their sonic experience under partial control by asking neighbours to use their generators at certain times. In all six cases mutually agreed hours to use the generator were agreed. Yet, after two or three weeks, five of the six neighbours reverted to original patterns, and tensions between neighbours were palpable. Again, we see how people's experience of everyday domestic

sounds were shaped by the behaviours and decisions of actors at the neighbourhood scale. And how the creation of domestic soundscapes is also associated with cultural values such as being a 'good neighbour' (Duffy and Waitt 2013).

Familiar domestic soundscapes were something that many people missed from life before the hurricane. Silence was recognized as being either *"very rare"* or *"not possible"*. The more generally accepted definition of silence, as used in everyday speech, was perceived by people as a lack of intrusive or obvious noise, perhaps better described as *"quiet"* (Tacchi, 2012). Therefore, a "quiet" home, is not necessarily to do with the level of sound at all, but as one end of a scale of normality – the absence of unfamiliar and disruptive domestic sounds such as generators, but not necessarily a lack of all noise.

Ultimately, domestic soundscapes were disrupted after Maria and shaped to what extent people felt 'at home'. Sounds beyond the house bleed into the domestic soundscape of homes, again demonstrating the porous private-public boundaries that constitute the sonic home. The ability of residents to regulate soundscapes was shaped by the ability to afford generators, the decisions and actions of the state and the ways neighbouring households adapted to state action (or inaction).

Conclusion

Our study makes several contributions to home studies and disaster studies. First, we develop the notion of the 'sensory home'. By exploring the intersection between notions of home and the roles of taste, smell and sound, we have shown that the sensorial, invisible and taken-for-granted aspects of domestic daily life, are of considerable significance in the experiences of home un/making. Our senses of hearing, taste and smell are not merely means of apprehending the materiality of home, but also form avenues for how people maintain and establish dimensions of their subjectivities within the social and material relationships that comprise home (Classen, 2010). As Duffy and Waitt (2013) argue when discussing sonic rhythms; senses, such as taste, smell and sound, are integral to a sensuous production of place. They are highly influential in the experience and perception of home,

intertwining to provide different layers of meaning and understanding of home. These senses influenced people's domestic comfort and feelings of homeliness, and we highlight how people value and desire a home composed of familiar sensescapes that are within their remit of control. The connection between taste, sound, and smell, we argue, is one mechanism that enables people to invest in, or distances themselves from home.

Our study also demonstrates how the sensory home is constituted by processes taking place on multiple scales and by multiple actors. Drawing on Fernández Arrigoitia (2014), we emphasise how the un/making of the sensory home is closely determined by the condition of materials and spaces on the borders of the house e.g., the streets, lighting. We also draw on Fernández Arrigoitia (2014), when theoretically and empirically demonstrating that the un/making of the sensory home is inherently political. That is, in disaster contexts, public services are restored much sooner in higher income and more "economically valuable" neighbourhoods than lower-income neighbourhoods. This spatio-temporal relations between the state and its citizens means that the recovery of domestic smells, tastes and sounds is highly uneven across neighbourhoods. As such, we suggest that the un/making of the sensory home is highly politicised and can be used to expose the unequal ways that the state supports its citizens in disaster recovery. Indeed, uneven wait times for the restoration of public services has been observed in many societies across the world, and so we call for further research on the relationship between waiting in disasters and the sensory home. Adding to this, our paper also demonstrates how scales beyond the state shape an individual's personal experience of domestic senses. More specifically, the unequal power relations between the US and Puerto Rico systematically determine and undermine Puerto Ricans' capacity to control their sensory home. Once more, we see how notions of the sensory home are imbricated with power relations and determined by powerful structural forces that transcend the boundaries of Puerto Rico and take place within the international political economy.

Taking this further, the Puerto Rico case raises some tentative insights about how a return to familiar domestic sensescapes may tacitly signify a return to a form of sensory colonisation. Put differently, the US-Puerto Rico relationship extensively shapes Puerto Ricans' domestic sensory landscape. From the foods and ingredients people smell and taste, to the raw materials, furniture, electrical items and petrol generators that compose people's soundscapes and visual experience. Therefore, recovering domestic sensescapes in former and currently colonised countries such as Puerto Rico may signify a return to a coloniality of senses. Yet, our study, and the women's' garden initiative in particular also suggests that there is an unwillingness to return to the coloniality of domestic senses – taste in particular. Although this initiative was not mobilised by an explicit political rhetoric, we suggest it may signify a grassroots form of resistance to power and sensory colonisation. As such, our research provides provisional contemporary insights on the colonisation of Puerto Ricans' senses, which builds on Mintz's (1986) historical analysis of taste, slavery and sugar in Puerto Rico. We encourage further research into the coloniality of senses and what this may mean for those recovering from disasters.

By situating our longitudinal research in a post-disaster context, our study reveals the temporality of the sensorial home, which builds on Baxter and Brickell's (2014) notion of the temporal material home. People's perceptions, experiences, and control of domestic sensescapes oscillate, because they are intimately shaped by the (changing) actions of actors beyond the household. In particular, the decisions and actions of the state and the ways in which neighbouring households heterogeneously adapted to the state's action (and inaction) after the hurricane. Thus, highlighting how sensorial homes are constituted by the relationship between public and private spheres.

Our study is particularly pertinent for disaster studies. We foreground how domestic lived experiences of disasters are predicated not merely upon the material and visible such as dilapidated houses, lack of basic services, damaged furniture, income loss, health deterioration, or other markers. Rather, the impacts of disasters also transpire via disruption

to the olfactory, gustatory, and sonic. We end here by suggesting that future research on both the home and disasters makes greater use of the virtues of a sensory analytical lens, bringing to light people's intangible and sensory experiences.

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[i] Feminist home scholarship stresses how for some, such as victims of domestic violence, the home provides neither security, nor agency (Blunt and Dowling, 2006; Price, 2002; Meth, 2003; Baxter and Brickell, 2014).

[ii] Recent work by Garriga-Lopez (2020) also demonstrates how US colonialism is compounding the impacts of Covid 19.

[iii] [iii] The study was assessed by and met the University of Manchester research ethics.

[iv] Public information on the market values of consumables, non-consumables, materials and labour were not available.