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A listener-centred approach to soundscape evaluation

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I am conducting a Grounded Theory study into measuring opinions of urban soundscapes. Participants are given a small portable recording device and asked to keep a sound diary for two weeks. At the end of the two weeks, they are given a 60-minute interview about their experiences. The methodology is designed to give people time to think about soundscapes on their own terms, recording what is important to them, rather than using a researcher-selected environment and vocabulary. Early data suggests people listen in a multitude of ways that challenge existing ideas of modes of listening, care more about work and home environments than public places, and that the role and importance of soundscape is both quantitatively and qualitatively different in varying environments. I also question the idea of what an expert listener is, with examples of various ways participants have demonstrated very high aural acuity without any acoustics, sound engineering or musical background, for instance.

1 Introduction

I'm conducting a qualitative, Grounded Theory study, finding out how people interact with and respond to soundscapes of the built environment. The study aims to prioritise individual listeners' perspectives, and primarily tackles finding out what is important, when, and in what ways, in people's day-to-day lives.

1.1 Methodology

My current methodology is the use of sound diaries to allow listeners to engage with sounds and sound environments in their own terms. Participants responded to adverts asking for help with a study into day-to-day sensory environments. The only mandatory requirement was to either be doing or have completed a postgraduate degree – this was to attempt to get participants with a high reading level and degree of critical thought, in areas other than sound.

1.1.1 Sound Diaries

Participants are given a small recording device (Zoom H2), a log book, and instructions to make two recordings a day for two weeks. I ask participants to focus on three main areas in recording:

1. Spaces they are every day, such as their usual work, home and leisure environments, routes to work and other spaces they frequently inhabit.
2. Times they're aware of a change in those spaces, due to feeling more or less comfortable than normal, different times of the day or night, or any other changes that make them perceive the space differently.
3. Any unusual or atypical places they're in, such as being on holiday or a day-trip somewhere they wouldn't normally go.

I stress that I'm interested in a record of their lives – that I'm trying to shed some light on people's day-to-day sensory environments and they absolutely do not need to go out of their way to be in spaces they don't normally inhabit; in other words, points 1 and 2 are much more important than point 3. I instruct them to make the recordings when they are able, but to try and get a reasonably representative cross-section of their lives.

The log book is to be completed when they make the (one minute) recording, and has basic fields for location, time and date, who they were with, what they were doing, weather conditions, any feelings about the space, and a space for notes. There is a field for sounds heard, in which I encourage people to write everything they can hear in their own words, and to underline the most prominent sound.

1.1.2 Interview

After recording, I conducted a 60 minute interview with participants about their experiences, and it is the interview data that makes up the findings in this paper. After an initial questioning about general experiences, I play through the sound diary recordings with the participant and discuss them where relevant. Finally, I return to any key issues identified by me or the participant.

The sound diary method was developed, based on Zimmerman's [1] diary-diary interview method, as a way to allow people to start thinking about sounds and soundscape, stopping turns towards sonic nostalgia (or indeed, simple forgetfulness) and desire to "perform" in interview, giving the interviewer what the participant thinks they want to hear. The interview allows me to explore and solidify the participant's experience, giving them the time and agency to describe it in their own words. "A fundamental benefit of diary methods is that they permit the examination of reported events and experiences in their natural, spontaneous context, providing information complementary to that obtainable by more traditional designs" [2].

Interviews were unstructured, although as the study has gone on I have developed a number of categories in which I try and elicit a response, relating to issues such as agency, like and dislike in major areas (work, home) and degrees of expert listening. It is the interview stage I focus on here.

1.2 Location

To date, soundscape research has focused heavily on urban public space. This rarely seems to be justified as a research location, with numerous studies looking at, for instance, parks and urban squares [3], fountains [4], streets [5], and train stations [6]. In fact, the "environment" in "Urban Sound Environment" seems to have a *de facto* definition of "outdoor, large-scale, urban public space". Few papers that talk about "Urban Public Space" look at anything *but* outdoor public streets and parks – disregarding city living, workplaces, shops, restaurants, and places of worship, for example.

By contrast, the majority of both sound diary recordings and discussion time in interviews has focused heavily on work and home environments. The primary urban public spaces spoken about were the semi-public, such as bars and restaurants. Very few mentioned fountains, trams or city parks, and when they did they had no strong opinion about them. Few mentioned urban public space as a concern in interviews, and if it was mentioned the importance afforded to it was low.

The two most recorded and commented on environments were work and home, respectively. Several participants gave varying opinions on public transport soundscapes, but in gen-

eral this environment seemed less important.

1.3 Vocabulary

Firstly, it seems there is no "natural" soundscape vocabulary that members of the public use. In most papers, the vocabulary generally seems to be researcher-categorised, fitting all responses into a single taxonomy, and often based around something like sound source — Human, Mechanical, Natural and their sub-categories, for instance. It seems to me that people don't really think about sounds, and asking them on the spot to give constructive feedback about the soundscape is both an unfair thing to ask, and the data resulting from it is questionable.

I am concerned that soundscape research in general seems to have skipped a step – I still don't feel we really know *how to ask* about soundscapes. Existing methods tend to confirm or reinforce what we already know, but don't tell us anything new or exciting, or help to understand how people process the soundscape.

I'm also concerned that fitting everything into a single, overarching hierarchy (that seems to almost always be the one the researcher was looking for in the first place) may be missing many other, more interesting or different, aspects to the data. Soundscape research strives to get away from objective measures of sound level, and yet quickly falls back towards describing sources as the building blocks of perception, with equal weighting to the different elements and little focus on salience, listening method, or relative importance.

2 Environments

During my study it quickly became apparent that "work" and "home" were the most important places for participants with "leisure" and "travel" being some way behind in importance. Also of great importance is the use of mp3 players. I'll look at the former two in some detail, and then give a brief overview of "leisure".

2.1 Work

With a postgraduate participant group, the "work" category can be somewhat hard to pin down. While this complicates the results somewhat, the freedom postgraduates have to choose their work environment gives rise to a large diversity of spaces and places in which participants work, with most participants being highly articulate as to their choices of environment.

The most numerous themes for work environments revolved around ideas of *concentration* and *distraction.* The majority of these codes revolved around sound events breaking concentration, hindering work or otherwise causing annoyance. Generally this led to a lack of focus, and in some cases resulted in low-level workplace feuds.

Individuals had very specific work environments they liked to work in, and were intolerant of perceived aural intrusions into these spaces. In work environments, people rarely mentioned sounds and soundscapes they actually liked, and indeed preferred work environments seemed to stem from the absence of a negative, rather than the presence of a positive.

Broadly speaking there were three categories of work soundscape preferences, although these varied based on the activity taking place.

2.1.1 Quiet — lack of distraction — removal of annoyances

Most participants' ideal work soundscape was achieved through the removal of perceived negatives, rather than the presence of positives. These negatives could be anything from single sources to general feelings about people or populations in the workplace. There was a large variance in the amount participants discussed annoyance, but every participant at least mentioned it. Generally speaking people who talked less about annoyance seemed to have a variety of coping mechanisms, and those who talked more either thought about sound as part of their course (two visual anthropologists who work heavily with sound), or used careful listening to diagnose equipment failure (a lab-based biologist).

> Elizabeth: I think the [florescent lighting] tube needs changing, uh that is actually really irritating, very distracting so, I'm actually going to have to ask somebody to come and have a look at that cos I'm not going to get any work done.
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> Gloria: I tend to not listen to things when I'm working on the PhD cos [if] it's Radio 4 I get pulled in to listening rather than working, concentrating on what I'm doing.
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> Imogen: There's a bar on the ground floor. That gets pretty noisy and then like I'm near a hospital so there's like ambulances going a lot of the time and there's a construction site across the road too so yeah [...] Some of the time [...] when you're trying to concentrate, these kind of noises tend to intrude.

Most participants would specifically attempt to pick work spaces that met their soundscape needs. This could mean they found home too noisy, and worked in a library as that was perceived to be quiet (Brian), or that they couldn't work in a library as the small intrusions in an otherwise quiet environment were too distracting (Claire), or that they'd end up constantly complaining about their sound environment in lieu of being able to change it (Elizabeth). Being distracted by a single sound source was a common occurrence – "[...] when there's one specific voice or one specific soundtrack going on, I can't write" (Andrew).

This was one area where participants became more aware of noise annoyance after doing the sound diary fieldwork. Francesca for example, got intensely frustrated by an escalator she hadn't previously noticed. Other participants (most notably Brian) had similar reactions to recording previously perceived "quiet" or "silent" environments, retrospectively realizing it wasn't that simple. There was no particular consistency here either, with various people seeing mechanical hum as either intensely off-putting (Francesca) or completely irrelevant (Elizabeth), and human talking as background babble (Andrew), welcome and necessary (Claire), or intense distraction (Brian).

Both ideal environments and coping mechanisms were discussed, however. Most important was a feeling of control over the sound environment, or some kind of personal space they could retreat, to escape the unwanted noises of work. Existing acoustics research [7] shows that a closable window,

or a quieter part of the house has a similar effect on perceptions of noise annoyance – a degree of control results in a disproportionate removal of annoyance. Several participants either had access to quiet environments at home, or work. For some people there was a noisy home environment (Brian, Elizabeth) and work was a welcome retreat. For some, work was a noisy environment (Claire, Gloria) and they did most of their work from home as it was perceived as a quiet, calm environment, but most of all one they were in control of.

Therefore, participants expect silence, find it not to exist and then get frustrated as a result. Francesca found that quiet environments could be more annoying, as small sounds intrude much much quickly.

> Francesca: So if someone drops a pencil, then you're like, "a pencil's been dropped!", whereas on Blue 1 in the library, there's a constant hive of activity you know, and I work best with that because then if someone drops a pencil you're not going to notice it, cos it's kind of in the background. [...] I can't really work at home just cos there's too many distractions.

The few positive experiences of quiet work sound environments correlate with a degree of control, feeling of ownership, or having another workplace to retreat to. Elizabeth had a noisy office she disliked, a communal lab that she generally found distracting but OK, but best of all – her own personal sanctuary, a lab almost entirely for her own use.

> Elizabeth: it's generally a nice quiet room which is good because the set up for when we're actually like dissecting the tissue [...] it's delicate work and you kind of need to be able to concentrate, if somebody comes in I do generally say to them "can you please, can you come back in about half an hour because I can't talk to you now?". I need, I need to be able to concentrate because you put scissors through the tissue and that's it basically [...] it's nice to have my own little room to set things up and not be bothered by anybody else going "Ooh what you doing?"
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> INT: Is it somewhere you feel kind of in control of?
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> Elizabeth: Yup, definitely. Cos it's, it's, nobody else needs to go in there so it's it's nice to have your own little domain uh, where I know I can go and not be sort of, bothered by other people.

These stories are repeated in different ways – an expectation of silence in a work context makes it frustrating and distracting if it's noisy – and indeed, there's no such thing as silence. A quiet environment, or an environment the listener feels in control of, is where the main perceptions of approval lie. Very few people had sounds in their workplace they actually liked – and often the sounds they disliked were repetitive and ongoing, but not necessarily acoustically loud.

2.1.2 Alternate, loud, secondary places for work

Several participants used a noisy, busy environment for certain types of work such as a bar, pub or café. Andrew was lucid here, and in a very similar way to Francesca, he does specific types of work in different places. These places were generally either busy public places, or busy workplaces.

> Andrew: Yeah, drawing I don't find noise distracting at all. Writing I find it very distracting. But it's funny, when music's, when it's kind of at a level, and when there's a lot of different noises going on, [...] I don't find noise distracting at all. When I've got one like, thing going on like, I couldn't work with music on in here. But, I can work with, and I can draw with anything on. But if there's like a hubbub, I can do anything, I can write, I can draw, you know, it doesn't bother me at all. It's just when there's one specific voice or one specific soundtrack going on, I can't write.

Others preferred to work around other people, or in communal workspace.

> INT: What, your ideal work situation, what would it be like, would it be completely quiet, would there be people around?
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> Daniel: Um, people around, but sort of everybody's working towards something. So you know if you need to zone in focus you can be quiet then, then it's possible and doable and acceptable, but I do like to have people around me, I'm quite gregarious.
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> Claire: I think it's something you get really conscious of as a PhD student, the amount of time you spend alone, so uh, it's always good to try and rope in a friend to meet you in the library and you know work with.

In contrast to quiet work environments where there is a desire to remove a negative, noisy or busy work environments are judged more positively and based on the quality of company, of ability to perform a task, or of comfort and familiarity. Often, they are seen as welcome retreats or diversions from more traditional work based places, and judged based on the presence of positives rather than the absence of negatives.

2.2 Home

Unlike the work code, participants in home environments had a much wider range of experiences. Generally speaking, the interaction was a lot more complex and depended on many more factors.

2.2.1 Baseline

There seems to be a "baseline" level of expected noise that is different for every participant. This baseline mostly seems to depend on noise levels from previous places of residence, or during childhood. Many participants expressed soundscape as either a major factor in moving house, or directly compared their current living situation to their previous one.

> Imogen: The area I'm in in Manchester, I think that because I was in kind of a quieter suburban place in Dublin [...] a lot of people when they were coming to my house [...] would notice how quiet it was, and I'm from the countryside originally so then that's quieter again, so then now I've kind of, I've kind of come to Manchester

and Oxford road I'm finding quite a noisy place, and my building as well is very noisy.

The degree of childhood adaptation can make startling differences to the perception of common noise annoyances:

> Francesca: I didn't really understand the concept of flight paths when I was younger cos I've always lived under flight paths, so actually the sound of planes is kind of equated with passing clouds, and I didn't realise that flying planes even emanated that kind of sound.

The connotations of the soundscape could be a big factor in the participants' sense of place. Intrusion of elements such as car alarms, shouting, bangs and crashes could often be a reminder that they were living in somewhere they didn't really like.

> Kate: It was a bit of a scumbag place to be honest. It was in a block of flats. But it wasn't horrible to start off with, it just became horrible 'cause loads of drug dealers moved in and err, so there was all police raids and shouting and fights and junkies and errr teenagers and fights and junkies and police raids and it was really noisy constantly. So the first thing that my children as well thought when we errr, moved into this house was we really, really appreciated the quiet.
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> Daniel: Yeah, the houses can be not very well looked after, you see people like rowing in the street for like you know full on blazing Jeremy Kyle style rows in the street so yeah it's not the, not the best location, but as I said, not the worst.

2.2.2 Feedback and Control

Using this personal baseline as a starting point, the participants' main factors in evaluating soundscapes revolved around issues of *feedback* and *control.* It didn't generally seem to matter if the participants were directly controlling a sound (choosing the music, hoovering) or not, but more if they felt they could feedback and have a positive effect (asking a housemate to keep the noise down). When this feedback loop was broken (feeling of annoyance — request for change — noise stops or is altered), the vast majority of complaints arose. When people felt this feedback loop was always to their satisfaction, it led to the strongest feelings of comfort and contentedness. This was the most extreme where people had very few or no coping strategies, or were incredibly sensitive to noise.

In a positive sense:

> Andrew: Just the fact that because I was doing something else as well, because the noises that I was making were directly correlating to something I was doing for me, both aurally and visually and that sort of stuff, like I was right here with the noises as I was smudging stuff, and like taking footsteps on the ground around what I'm doing, yeah [...] it just felt really really peaceful and nice.

For some, lack of feedback could lead to feelings of loneliness or isolation.

> Hugh: The house is quite well built really so it's kind of, you know, stone — sounds don't really carry particularly well between um, between rooms and stuff. Although that's nice it's also a bit annoying, I think it's nice to have a kind of privacy but at the same time you don't want to be too cut off, you want to be knowing what's going on to a degree, otherwise it sort of feels a bit lonely, doesn't it?

Disagreements over noise were especially prevalent and even the participant most comfortable with loud noise struggled when this basic feedback loop was disrupted or ignored.

> Francesca: It just is very, even if it's not played at a high volume, it's very loud music, and very kind of aggressive, I don't know, he really loves it and he loves singing along to all the words and that's fine, I'm not going to knock that, especially as he doesn't really like my music. [...] Most of the time I don't say anything, just because I don't really feel like it's my place to criticise his taste in music [...] I generally don't say anything but then other people will, um, not even necessarily people that live in the house, and that's always quite funny, I think that's because he had a while different group of friends before he moved in with us.

Similar feelings of lack of control came from everything from interactions with noisy neighbours, to loud cooker fans that their landlord wouldn't repair. Positive feedback happened when participants felt they had control over the people and sounds around them.

2.3 Leisure

Soundscape seemed to be a factor in people's leisure environment choices. A brief summary, as there isn't space to go into this in this paper:

- Almost everyone preferred a busy environment, but not one so loud you couldn't hear the person next to you. Choice of music was a lower priority than music volume, generally speaking. This could say as much about the postgraduate demographic as anything else - several participants expressed a preference for debate, in depth conversation and political discussion over dancing or drinking, for instance.
- Cafés and restaurants, while noisy, seemed to be something almost everyone enjoyed. Often the reason for going was to eavesdrop, or the presence of other people was a signifier it was a good place to be.
- The music fans didn't mind loud environments however, and enjoyed the whole environment of live music/DJ nights however loud it was.

3 Listening prototypes?

One of the most unexpected findings in my study so far is the variety of ways people both listen and dishearken. The

majority of participants therefore had some form of what could be considered expert listening. Even though only one of my participants had any kind of music background (a drummer), several showed high degrees of aural acuity in certain situations. Some, working in other areas of sensory research (visual anthropology) had spent significant time thinking about and processing sounds, generally with a vocabulary different to people with an acoustics background.

In every case, the acuity was linked to some other aspect of their lives. I would therefore propose that there are a number of listening archetypes, which may or may not linked to non-empirically postulated listening modes proposed by various authors [8, 9, 10, for example]. Some examples of what these might be follows, with some metaphors for these ways of listening.

3.1 Types of expert listener

3.1.1 The Holistic Composer

Hugh plays the drums and picks up on rhythm and tempo in both his music listening and soundscape interaction. He thinks about composition a lot, and what he would change if he was the composer of the soundscape. Rhythm of traffic and life are factors in his mood. He sees overuse of car horns as sign of aggression in general being on the increase.

3.1.2 The Food & Wine Critic

Andrew has detailed descriptions of things he likes and dislikes. He makes many connections between sensory stimuli and has a high awareness of auditory and sensory transitions, even though he lacks specific technical vocabulary. He generally likes his melange of day-to-day experiences and finds exploring the world interesting and engaging.

3.1.3 The Watchmaker

Elizabeth uses a lot of high precision machinery. She's sensitive to very small changes in the noises of lab equipment, and very jumpy and sensitive to loud or improper noises. She does very sensitive work in very quiet environments and places high value on concentration and focus. She appreciates similar quiet environments at home, and has a highly acute sense of hearing.

3.1.4 The Exhibition Curator

Claire uses music as a precise tool to set the mood for certain activities. She uses her walkman consistently when outside the house, and has stereo or TV on at home. She is very picky about what she will listen to, when and where.

4 Conclusions

I am developing a new way of researching urban soundscapes based on a purely qualitative methodology. Qualitative methodology has a lot to add to our understanding of what soundscapes are, where and when they matter and to whom. Above all I have focussed on learning from people themselves how they listen and what they care about.

Focussing on people and their lived experiences should be at the centre of soundscape research, and in many ways I feel soundscape research remains glued to its acoustics background of site-specific studies, without moving on to find new and fresh ways of exploring aural phenomena. Quantitative methodologies have tended to focus on similar environments, in similar ways, unproblematically and with a large set of assumptions about categorisation. A tighter integration between qualitative, exploratory, small-scale studies, and quantitative, large-scale studies can only help further and improve the quality and relevance of both.

My initial results show a great variety of ways people listen and interact with soundscapes of the built environment. The way people listen and react to the soundscape changes depending on activity, time of day, weather, the place they grew up and the company they keep, for instance. It's also modified by demographic factors such as age, family and friendship groups, occupation and gender. There is a multiplicity of modes and ways of listening, which have profound implications for the ways questions are asked of soundscape participants.

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