

Using the modality of hearing to design more inclusive public spaces: an exercise in awareness and empathy building

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Organization of the talk

- Orientation
 - What kind of spaces we are talking about
 - Sound matters
 - Who we are & what we do
- Background and positionality
 - What kind of diversity we are talking about
 - Designing for aural diversity
- Proposal for an empathy building workshop

What kind of spaces are we talking about:

- Urban environments (cities) and the sounds within
- Outdoor public spaces
- Spaces largely under the responsibility of the public sector

Sound in the built environment is often ignored until it's too late



Traditional noise approaches have been successful
in reducing the impacts of many sound sources





Measuring sound levels alone cannot help to
plan and design usable public spaces

Extending the conversation to inclusivity

- Outdoor spaces rarely accommodate a diversity of sensory experiences
- We expect those with sensory disabilities to navigate their environments with the help of apps and devices
 - The onus is on the person rather than the environment
- My work on hearing aids gave me the opportunity to hear what it's like to use one of these devices
 - Millions of dollars are spent to improve the hearing aid for 1-2 dB of improvement
 - The city is chaotic and directional hearing is severely compromised through the hearing aid - and divers honking are enough to jeopardize what the hearing aid is trying to address

Who we are

- Urban soundscape researchers (Sounds in the City, Montreal)
 - Living laboratory connecting sound research to urban planning and design
 - Portfolio of projects including public space, nightlife, festivals, and pedestrianization
- Inclusive design researcher (AMAI, Bucharest)
 - Aim to create an equitable society for people with temporary, contextual and permanent disabilities by applying the principles of inclusive design through architecture, technology and social projects.
- What we do:
 - Immersive & interactive methods
 - Intersection of sensory experience and urban planning/design
 - Knowledge mobilization – a two-way exchange, as opposed to one-way “translation”



Using workshops as a knowledge mobilization tool between researchers and professionals of the built environment



Guided activities allow emergent knowledge and solutions



Immersive soundwalks highlight the sensory experience

Photo: AMAIS

Structural barriers - the main unit of measurement – dBA – assumes 'normal' hearing



We thus ask:

- What does inclusivity mean for people with sensory disabilities?
 - Mobility challenges (like wheelchair access) dominate accessibility conversations (Imrie & Hall, 2001)
 - Designing for visual diversity is increasingly common (although not mainstream)
- **What does it mean to design for aural diversity - especially in public spaces?**
- Can spaces designed to be more inclusive of aural diversity help more than just the target users?

Designing for aural diversity

Some background

When we say 'disability', we mean...

- *A mismatch between environment and ability*

- **Disability** can be:

Permanent – ex. An amputated limb

Temporary – ex. The recovery period after an invasive surgery

Contextual – ex. The difficulties a hearing person has trying to listen to an audio announcement in a crowded and noisy airport.

- Disabilities aren't always isolated

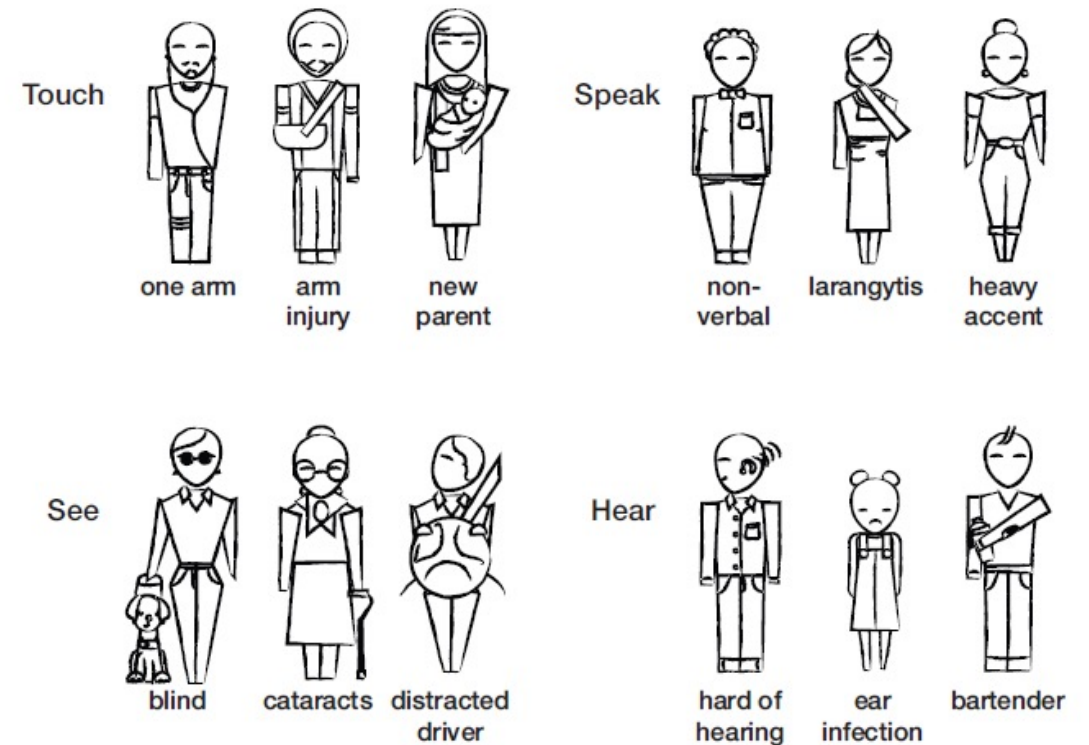


Photo credit: Mismatch - How Inclusion Shapes Design, Kat Holmes

Inclusive design

- Some approaches suggest special adaptations of an existing space for people with disabilities
 - It can still create segregation and discrimination even if access is offered
 - A mobility example: wheelchair users and low-vision users can be in conflict about what is a good height for a curb (Lid and Solvang, 2016)

so... **DESIGN FOR ONE, EXTEND TO MANY**

- identify exclusion
- who feels exclusion the most
- promote inclusive dialogue to understand the obstacles, the diverse needs and develop and test solutions together
- Inclusive design has been described as a process rather than a result (Imrie and Hall, 2001, Iwarsson and Ståhl, 2003, Steinfeld and Maisel, 2012)

Experiencing aural diversity in public spaces

- We acknowledge we are glossing over many fields, such as disability studies that have identified challenges across the ability spectrum
 - However, we suggest that as sound is generally ignored by professionals of the built environment, even fewer considerations are given to those who are perceptually and cognitively diverse
- Limited design guides exist for navigating aural diversity
 - One example is the 'deaf space guide' from Gallaudet University, for interior spaces
- Disability 'solutions' are often not universal and can create negative experiences for users that don't rely on navigation aids
 - e.g. alarms don't have to be alarming (for example the Boston subway)



Who is aurally diverse?

- People across the hearing spectrum
 - Hearing loss due to e.g. age, work etc.
 - Use of assistive devices
 - Neurodivergence and aural sensitivity
 - People with a combination of disabilities
- If we return to this scene, can we assume all users would have the same *pleasant* experience?



We argue that...

- Articulating the disability context could get professionals of the built environment to pay attention to sound and even multimodality

so... **A NEW APPROACH IS NEEDED:**

- Acknowledging that inequalities are built into the concrete
- Encouraging a different conceptualization of “normal” hearing
- Encouraging a horizontal multistakeholder participation
- Considering multimodal legibility as a baseline
- Respecting that inclusive design is better for everyone

No *one* group has the solution

- City users with disabilities
 - “experts in experience”
- Researchers
 - “experts in theory”
- Professionals of the built environment
 - “experts in creating and managing the public realm”
- Accessibility and inclusive design experts
 - “experts in acces&inclusion”
- Public authorities
 - “experts in how cities function”
- Other decision makers and public authorities

These groups aren't necessarily distinct

Building empathy

Towards an inclusive workshop

Integrating the plurality of voices: an inclusive workshop

- Bringing together professionals (including architects, planners, designers) and participants across the hearing spectrum
- The workshop goals are to:
 1. Build empathy
 2. Set the bases for design collaborations on an equal footing
 3. Call for research experts to engage beyond a technological mindset
 4. Establish a two-way exchange of information to produce relevant and applicable knowledge bridging research and experience
 5. Test possible solutions

Workshop format (Part 1)

1. Initial roundtable with people with aural disabilities
 - Develop a soundwalk trajectory & priorities
 - Emphasis on a variety of outdoor spaces (including public spaces)
2. Soundwalks in diverse urban environments with people with aural disability
 - Conduct soundwalks with initial participants (commented)
 - Record soundwalk using binaural recordings
3. Manipulation of soundwalk recordings
 - Adjust recordings with simulators (e.g. different levels of hearing loss)
 - Load different walks on different playback devices



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Photo: Christine Kerrigan

Workshop format (Part 2)

4. Augmented soundwalk

- Introduction to aural diversity for broader participants (e.g. built environment professionals and other community members)
- Participants use headphones at various sites listening to others' simulated environments (from Part 1)

5. Second roundtable meetings

- Discuss soundwalks and sketch ideas to reduce barriers

6. Large debate with everybody to:

- share experiences
- discuss obstacles faced and possible solutions



Photo: AMAIS

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Potential emergent themes for inclusive sound environment transformations

- Access to quiet spaces
- Intelligibility of speech and other environmental cues
 - Pacing the information
 - Sound levels
- Acknowledging and reducing the disproportionate impact of traffic and construction noise on public spaces
- Identifying and removing distracting and impulsive sounds
- Public art that reinforces the space through fascination and interaction

Workshop format (Outcomes)

- Report highlighting lessons learned
- Prototype a solution for collective evaluation using a soundscape simulator
- Potential for an exhibition



Simulating soundscapes can allow us to hear the environment before building it

Questions for you:

- What to focus on with such a soundwalk?
 - E.g. obstacles faced by people with hearing disabilities, needs, preferences in relation to public space perception
- Which simulations capture the diversity of experiences?
- How to best capture the insights from this conversation?
- How to highlight diverse experiences?
- How to model different experiences?

And after the workshop, please contact us to:

- Make us aware of worldwide best practices
- Tell us about methods to investigate the efficacy of design tools targeted at aurally diverse people,
 - And ways to include them in design strategies (both for the public and private sector)
- Discuss on how to build awareness about how the built environment status quo is not an adequate baseline and we should encourage cities to change

Additional references

- <https://www.sciencedirect.com/science/article/pii/S1875067215000863>
- <https://www.scielo.br/j/csp/a/8SDdqJTXNrbrVxgYHvhmD6m/?format=pdf&lang=en>
- <https://www.gallaudet.edu/campus-design-and-planning/deafspace/>
- <https://www.landscapeperformance.org/collections/deafspace>
- https://www.cibse.org/getmedia/64f9406c-88ac-4efe-b1d5-74fe9a716c1a/B_559_21_0089-design-for-the-mind.pdf.aspx
- Additional references; <https://www.landscapeperformance.org/collections/deafspace>
- Interesting perspective related to "deaf gain" versus hearing loss - <https://www.youtube.com/watch?v=FN Gp1aviGvE>

End. Thank you!

Background research

- Across two public spaces, one quiet, the other bustling and adjacent to traffic - people evaluated the quieter space the same; in the noisier, those who are older found it louder, more chaotic, less calm, and less appropriate (Bockstael et al, 2019)
- Adults with hearing loss in urban environments experience less feelings of isolation compared to rural (Hay-McCutcheon, Reed, Cheimariou, 2018)
- In terms of hearing diversity, very limited research on how users experience and navigate urban environments
 - Some limited work on neurodivergent people with different sound sensitivity, but rarely outdoor public space