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Soundwalks as Sensewalks: The Case for Integrated Sensewalks

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ABSTRACT

Smart city concepts are mainly technological concepts, which is why IT firms, in particular, have rediscovered the city. But cities should not only provide for efficient management, they should also ensure a high quality of life. Health and wellbeing are concepts that rely heavily on subjective factors. Therefore, subjective perceptions of the environment need to be taken more seriously.

Soundwalking is a well-established method of qualitative research, even referred to in the ISO norm for soundscapes – which is hardly surprising since noise is a major stressor for human health. But there are other important stressors for health and wellbeing – such as artificial light and smell - which have not yet gained as much recognition.

Sensewalks are gaining momentum in urban studies. Drawing on experiences with soundwalking, we began to experiment with combined sound- and lightwalks. This combination comes with its own requirements and specificities, but the results underpin the relevance of integrated sensewalks for a better understanding of urban environments and a more adequate approach to urban planning. Based on a short overview of the methods and the results of combined sound- and lightwalks and a rough classification of combined sensewalks and their potentials, I will argue the case for a broader view of integrated sensewalks.

Keywords: Sensewalks, Soundwalk, Lightwalk, Combined Walks, Sensory Urbanism, Perception

1. INTRODUCTION

Digitalization provides many opportunities to enhance productivity by using data that are automatically generated by digitalized processes. This is of great importance not only for the production and services sectors but also for the provision of infrastructures. Unsurprisingly, especially IT firms (and more and more other types of data generating and processing firms (e.g. google, amazon)) have (re)discovered the city as a field of activity. In this context, the provision and integration of different types of (network) infrastructures is of particular interest. Due to their origin, smart city concepts are mainly technological concepts. But cities as the most complex human artifacts are much more than just an accumulation of technologies. They are living spaces for humans and, as such, should offer favorable living environments and contribute to people's health and wellbeing. Cities should not only provide for efficient management, they should also ensure a high quality of life.

Since humans are multisensory primates, health and wellbeing are strongly influenced by what our senses perceive, or cannot help perceiving. This becomes crucial with regard to environmental pollution. With technological progress, the measurement of pollution (and its automatic detection and measurement with smart concepts) is becoming increasingly widespread as well as more accurate and more readily available for (instant) intervention. Environmental pollution is normally measured objectively by measures such as concentration of pollutant per unit volume of water, air or some other substance, sound pressure or illuminance levels. There is a lot of debate about the setting of thresholds, more or less scientifically established, up to which the emission of the respective pollutant is supposed to be acceptable. Measures and thresholds are highly contested, though.

In the context of noise pollution – and also, if to a lesser extent, light pollution – measurements play an important role, and noise abatement strategies in the EU (especially for traffic noise) are mainly based on noise emission calculations (expected average noise levels). But these pollutants are also part of human sensory perception and therefore have an important subjective content beyond what can be objectively measured. Moreover, health and wellbeing are concepts that rely heavily on subjective factors. Therefore, subjective perceptions of the environment need to be taken more seriously.

Obviously, there is growing awareness of this need, and soundscape studies have been groundbreaking in this respect. Soundwalks are a well-established method of qualitative research, even referred to in the ISO norm 12913 2:2018 for soundscapes – which is hardly surprising since noise is a major stressor for human health. But there are other important stressors for health and wellbeing – such as artificial light and smell - which have not yet gained as much recognition. In recent years, however, other types of sensewalks have gained momentum in urban studies (Adams, Askins 2013; Burckardt 2006; Debord 1958; Dunn 2016; Henshaw 2014, Schwanhäuser 2016).

Drawing on experiences with lightwalks, and in collaboration with a colleague with experience in the field of soundwalks, we started to experiment with combined sound- and lightwalks (Henckel 2019, ISR 2017, Radicchi/Henckel 2018). Walks laid out for a combination of senses have their own requirements and specificities. The results, however, underpin the relevance of integrated sensewalks for a better understanding of urban environments and a more adequate approach to urban planning.

This paper makes the case for integrated sensewalks. A short introduction to

integrated sound- and lightwalks and an overview of the methods used and the results obtained will be followed by reflections on a broader view of integrated sensewalks and a discussion of their strengths and weaknesses as well as an outline of research desiderata

2. COMBINED SOUND- AND LIGHTWALKS

With the growing awareness of the major role of the senses for our perception and understanding of our environment as well as of the major impact these sensory perceptions may have on human health and wellbeing, sensewalks have become a more or less established method of sensitizing people and collecting subjective data.

Of course, the history of walks that could be subsumed under the category of sensewalks actually dates farther back – just think of flânerie and dérive (Benjamin 1982; Burckardt 2006; Debord 1958, Hessel 1929/2012), among others –, but for the more specific purposes of sensitizing and data generation, soundwalks are the relevant model (Westerkamp 1974). Sensewalks explicitly focus on one sense at a time. As far as I know, no bi-sensory, let alone multisensory, walks have as yet been implemented. But combined walks are a highly rewarding, if challenging, enterprise, as I propose to show using combined sound- and lightwalks as an example.

So, as a first step, a brief outline of the commonalities between light and sound seems to be indicated. Both light and sound are

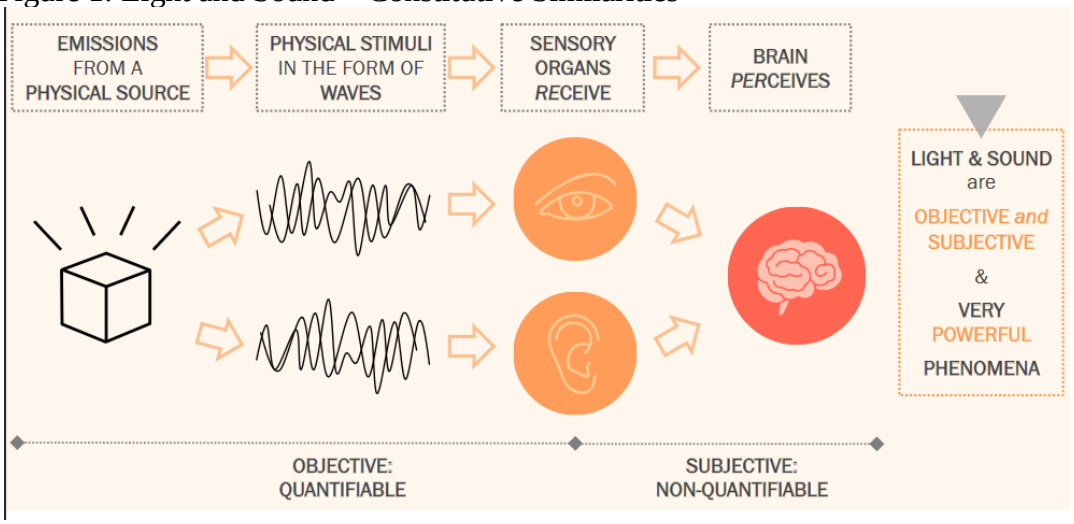
natural and artificial phenomena – our environments are full of natural as well as artificial, i.e. manmade, sounds and lights;

- physical entities and can, therefore, be objectively measured and subjectively perceived by human sensory organs;
- processed and interpreted by the brain and, therefore, subject to highly subjective valuations;
- ephemeral phenomena that often change within extremely short periods of time;
- potential pollutants that, under certain circumstances, may impact on the environment, in general, and human health and wellbeing, in particular.

But there are also important differences:

- Artificial light – and this is the only type of light I am talking about – is an aim in itself, i.e. something that may be perceived, at the same time, as desirable by some and as a pollutant by others.
- Artificial sounds or noises are a negative by-product of an otherwise intended activity; thus, traffic noise is the by-product but not the aim of transportation.

Figure 1: Light and Sound – Constitutive Similarities



Source: Radicchi/Meier/Henckel 2016

Like any other pollutant, noise and light can have detrimental effects on flora and fauna as well as human health and wellbeing. Noise pollution is the second most important environmental stressor after air pollution, affecting our health, wellbeing and quality of life (WHO 2011). Artificial light at night disrupts the chronobiological rhythmicity that is based on the day and night cycle. Potential impacts are sleep disruption, weakening of the immune system and other human health hazards – besides negative impacts on ecosystem services, food webs, pollination, sky visibility etc. (Meier 2016).

While there are several approaches for dealing with both light and noise pollution, approaches to noise pollution are already much more sophisticated. Most of these approaches – especially for noise pollution – rely on quantitative criteria. Thus, they fall short of coping with the ambiguities of the perceptive valuation of lights and sounds. Moreover, both pollutants are addressed separately, which means that their possible interplay is not taken into account, let alone included in an integrated urban planning. This interplay, however, is crucial for the valuation of locations in terms of amenity, security, aesthetics etc. – and, as a consequence, wellbeing. Therefore, sensible and sustainable urban planning needs to take these dimensions into account.

Sensewalks are a method of sensitizing for the perception and valuation of sensory phenomena and, at the same time, a method of producing data sets (Wieringa/van Es 2018) that can be used as a basis for a qualitative evaluation of impacts. This evaluation, in turn, can then be drawn on to develop and define planning guidelines and policies that address these issues. Combined walks seek to extend the focus to more than one sense and to contribute to the production of knowledge about the interplay of two or more senses.

The experiences reported here refer to a number of experimental combined sound- and lightwalks conducted by a colleague and myself (Radicchi/Henckel 2018, Henckel 2019). We conceived the combined sound- and lightwalk as an experimental method of analyzing and evaluating the impact the combination of light and noise pollution may have on people's health, quality of life, and social wellbeing. The combined method was first implemented in the context of a student studio realized at the Technical University Berlin in the fall semester 2016 and dedicated to a comparison of the sound- and lightscapes of Berlin and Florence. To this end, one case study area in each city was chosen. A second implementation with a more sophisticated methodology was carried out

as a side event to the XXXII Italian Congress of Geographers in June 2017 in Rome, where we conducted a combined sound and light walk with a group of congress participants.

Based on Westerkamp's (1974) definition of soundwalks, we defined the combined sound- and lightwalk as "any excursion whose main purpose is listening to the environment and looking at its artificially lit components" (Radicchi/Henckel 2018). This kind of sound- and lightwalk combination has several specificities and implications due to

- the simultaneous concentration on two senses (hearing and vision) and
- the specific timespace, i.e. the night, since artificial light is mainly a nocturnal phenomenon.

Therefore, a combined sound- and lightwalk is a specific kind of bi-sensory walk: it explicitly includes vision - normally not addressed - and, due to its focus on artificial light, can only be done in the specific timespace of the night. For light walks, the night is the obvious timespace, whereas sound walks are rarely done at night (McCartney/Gabriele 2001). In general, "sensewalks," being mainly done by day, tend to neglect the temporal dimension, and especially the night. Thus, despite the fact that natural and artificial environments as well as routines and practices change dramatically over the course of the day as well as during the night, little attention has been paid to differences that are due to the specific time of day.

Life is adapted to the natural cycle of day and night, light and dark. The night is not only darker, it is also cooler and quieter. Civilization brought along new sounds and artificial light. The wide diffusion of artificial light, in particular, led to a "colonization of the world after dark" (Melbin 1987). For the conquest of the night, artificial light is a prerequisite; it would not have been possible without it. Artificial light changes the environment quite dramatically (Rich/Longcore 2006). The use of the night for production, entertainment, maintenance and repair work also leads to new night sounds. The colonization of the night could be told as a joint history – yet to be written – of new lights and new sounds (as well as new smells).

While light as such is primarily seen as something positive – which is also ingrained in many languages, e.g. "enlightenment" – the negative impacts of light pollution (glare, trespass, over-illumination, sky glow) are the negatively valued effects of the intended action itself: the provision of lighting. In this respect, light differs from other forms of environmental pollution (such as noise) that are usually a negative by-product and not an intentional part of the activity. Thus, light is much more ambivalent in the sense that the intended product itself has become a pollutant.

3. METHODS

Based on the definition of a combined sound- and lightwalk as "any excursion whose main purpose is listening to the environment and looking at its artificially lit components" (Radicchi/Henckel 2018) we organized combined walks with reference to the soundwalk classification proposed by Radicchi (2017; see table 1). This classification consists of four variations that "are differentiated according to the purposes to be fulfilled through the conduction of the soundwalk: civic and political, educational and research purposes; accordingly, the soundwalks are categorized in: silent soundwalks, commented soundwalks with simple evaluation points, solo soundwalks and soundwalks with complex evaluation points" (ibid.).

Table 1: Classification of soundwalks according to the "4 Variations".

Purpose	Kind	HOW TO/Instructions
Civic and political *To increase sonic awareness of listening and the soundscape culture*	Silent soundwalks	Define a route, potentially with several listening stops along it. Then, walk in a line at a slow pace and stick to the route, in silence. If listening spots are part of the soundwalk, stop the group at these points and focus on listening for one minute, in silence. Then go on. At the end, a group discussion takes place. Questionnaires and maps can be handed out to facilitate the discussion. Participant data collection is not recommended during the soundwalk.
Educational *To train for soundscape action research*	Commented soundwalks with simple evaluation points	Define a route with several evaluation points along it. Then, walk in a line at a slow pace and stick to the route, in silence. Stop the group at the evaluation points, focus on listening for one minute, in silence. Then start the group discussion. Then go on and repeat the procedure at each evaluation point. At the end, a group discussion takes place. Questionnaires and maps can be handed out to facilitate the group discussions during the soundwalks and at the end. Data collection is encouraged during the soundwalk.
Research *To evaluate the soundscapes in order to develop analyses, evaluation and planning criteria*	Solo soundwalks	Walk in silence along an open, imaginary, improvised route. Follow your ears and let them guide you in the sonic exploration of the area. Data collection is highly recommended immediately upon completion, in the form of a sonic diary/sonic notes/sonic mental maps. Recording the solo soundwalk and listening to it when back home is highly recommended to reflect on variations in perception. Binaural recordings are highly recommended.
	Soundwalks with complex evaluation points	Define a route with several evaluation points along it. Then, walk in a line at a slow pace and stick to the route, in silence. Stop the group at the evaluation points, focus on listening for one minute, in silence, and start the collection of mixed data. Then go on and repeat the procedure at each evaluation point. At the end, a group discussion takes place. For comparative analyses, the collection of mixed data implies: • Quantitative data: DB(A) measurements, source definition; • Qualitative data: field recordings, psychoacoustics analyses, questionnaires, pictures, videos. Binaural recordings are imperative in order to develop psychoacoustics analyses.

Source: Radicchi 2017

All the walks we have conducted up to now (for the student studio and the side event to the Geographers' Congress) were conceived as combined sound- and lightwalks for research purposes. The routes were devised to include a variety of sound- and lightscapes.

The Berlin and Florence walks each had 11 participants plus two guides and took about 45 minutes. They were done as silent walks, and participants were asked to concentrate on both the sound- and the lightscape. In a final group discussion, participants were encouraged to give a description and valuation of their perceptions. Based on these walks, four locations were selected for a more in-depth investigation where sound and light measurements were taken in several nights and questionnaires with closed and open-ended questions were distributed among passersby (ISR 2017).

The Rome walk was designed to include five complex evaluation points. These evaluation points were systematically selected to represent a variety of sound- and lightscapes (e.g. a busy spot with many people, restaurants, and busy streets with cars and public transport; residential streets; parking areas, entrances of a hospital and a police station). Obviously, these settings were characterized by a variety of sound sources, types of lighting (e.g. street lighting, vehicles, shop window lighting, private lighting, security lighting), and actors associated with them. At each evaluation point, measurements were taken by the guides. Sound measurements were taken with a SAUTER SU 130 sound level meter as dB(A)laeq over a time frame of 1 minute. Light measurements were taken with a testo 540 lux meter as lux at different spots of the respective evaluation point to cover the range of lighting levels from different sources (e.g. street lighting, shops, very brightly lit entrances of a hospital and a police station, etc.). For the Rome walk, a standardized questionnaire was used for participants' ratings at each evaluation point. These ratings were done on 5 point linear scales for soundscapes (from not quiet to very quiet), lightscapes (from not dark to very dark), and the pleasantness of the sound- and lightscapes (not pleasant to very pleasant). In addition, an open-ended question for comments on specific impressions was provided at each spot. This walk, too, ended with a final group discussion. The combined sound- and lightwalk in Rome had ten participants and took 70 minutes. Participants were conference attendees who were interested in the topic and came from various European countries, most of them not from Italy and only a

few with a Roman background. None of them was a resident of the area.

All the walks were conceived as an investigation of specific sound- and lightscapes using qualitative and quantitative data, and as first tests regarding the relation between participants' perception of lights and sounds and the respective measurements.

In principle the collected data (from the different settings) allow for a broad range of comparisons:

- sound and light measurements between spots,
- sound and light perception between spots,
- relation between measurements and perceptions (sounds and light) at each spot,
- relation between sound and light perception at each spot,

and, in the case of the extended student studio,

- relation between the participants' perceptions and the perceptions of the passersby who were interviewed,
- relation between the cities.

This rather generic description already reveals the huge informative potential of the joint application of the different methods. In the following, I will primarily focus on the results of the Rome combined sound- and lightwalk.

4. RESULTS

The combined sound- and lightwalk was a pilot study with rather promising results. However, given the small number of participants, they should be interpreted with caution (Radicchi/Henckel 2018; Henckel 2019):

- The results show that the perceived pleasantness depends on a similar valuation of the sound- and the lightscape: The two most unpleasant spots were also those with the highest levels of brightness and lack of quietness.
- The valuations of darkness and quietness were similar to and in accord with the measurement results at most of the spots. The location that was perceived as the darkest and most quiet one was the only exception: noise measurements significantly differed from noise perception. The perceived fragility of the spot due to the occasional passing car or motorbike – which may account for the measurements – could be an explanation.
- Mechanical and motorized noises (e.g. cars, trams, motorbikes, ventilation machines) were consistently rated as negative and very loud; in contrast, perceptions of (artificial) light sources were much more ambivalent: e.g. the very brightly lit entrances to the hospital and the police station were perceived as annoying, whereas an area that was very brightly lit by a sky beamer (because of an open air event) was considered appropriate.
- Pleasantness is the item with the most remarkable differences in valuation: one location, e.g., was valued "not pleasant" and "very pleasant," respectively, by two participants. An explanation could be that participants differed in their individual valuation of urban liveliness. This explanation could also hold for the much higher general ambivalence found for perceptions and valuations of artificial lights as compared to artificial sounds.
- Another location was rated as "pleasant" by all participants but one who perceived it as insecure and a place to avoid because of the high levels of darkness – which alerts to the ambiguity of safety perception in different sound- and lightscapes.

4. DISCUSSION

Due to the small number of participants the results are not representative. Nevertheless, they are indicative and reveal a great potential in terms of refining the methodology and enhancing the empirics in view of knowledge production. In my view, the development of combined sound- and lightwalks should proceed along the following lines:

- Increasing the number of walks and the number of participants would extend the knowledge base and provide more solid and reliable results. This holds for walks with different groups at the same places and for walks (with the same or different groups) at different places. Walks with different groups at the same places could reveal how perceptions may differ between groups depending on participants' experience with the topic (e.g. lay people or people with some knowledge of the topic). (Lightwalks with audiences of different knowledge levels conducted by myself in Berlin suggest great differences between them).
- Enhanced media use (photography, films, sound recording) would broaden the empiric material and allow for at least some analysis of the (short term) dynamics of sounds and lights.
- Increasing the number of walks and, thus, of participants would allow for a more meaningful and systematic evaluation of the relation between measurements and participants' perceptions.
- Even though the scales from not loud to very loud are more or less established in soundscape studies I would suggest experimenting with revised scales – from too noisy to too quiet and from too dark to too bright – that explicitly use both the positive and the negative terms.

As indicated above, there is more to cities than just good functioning in technological and management terms. Since humans are sensory animals, urban planning needs to explicitly take into account their perception of the urban environment and its impact on health and wellbeing. Thus, the case I argue here is not for the use of different measurements and models but for a systematic and sensible integration of citizens' perceptions into urban planning. Combined sound- and lightwalks, especially if accompanied by measurements, could serve as a model for other combined sensewalks, thus providing a relevant pathway to the production of knowledge for more sensible urban planning and contributing to the design of an environmentally just and healthy city. Humans are day active primates and, due to their evolutionary legacy, need to use the night as a time for rest and repair. Therefore, we need to be aware of the negative impacts, both separate and, even more so, joint, of noise and artificial light on their health and wellbeing.

6. FURTHER PERSPECTIVES – SOUND- AND LIGHTWALKS AS SENSEWALKS

Combined sound- and lightwalks are only a first attempt at experimenting with other types of bi-sensory or – to reach an even more holistic level – multisensory walks. The following tentative taxonomy of experiential and sensory walks could help to put combined sound- and light walks in perspective.

Table 2: A Tentative Classification of Experiential Walks and Sensewalks

Type of Walk	Day Time	Night Time	Focus
General, unspecified experiential walks, sensewalks			
Walks, Flânerie	X	X	General perception of the environment
Dérive	X	X	Emotional, atmospheric and psycho-geographical perception
Night Walks	/	X	General perception of the night, nightscapes
Time Walks	X	X	Urban rhythms, temporal patterns, timescapes
Specified sense walks			
Soundwalks	X	X	Aural perception
Smellwalks	X	X	Olfactory perception
Tactile walks	X	X	Tactile, haptic perception
Visual walks	X	X	Visual perception
Lightwalks			
Lightwalks	/	X	Visual perception of artificial light

Source: My compilation.

Three different categories of experiential walks and sense walks can be distinguished:

- General unspecified experiential walks with no specific focus on one or more senses, aimed at sensitizing for a multiple and alternative perception of the city ("flânerie"/"dérive"), of urban rhythmicity ("time walks") (Mayr/Radicchi 2013) or of a specific timespace ("night walks") (Diaconu 2011; Dunn 2016; Springgay, Truman 2017);
- Specified sense walks focused on only one sense (sensory organ) (single sensewalks) or more than one sense (combined sensewalks);
- Lightwalks are a somewhat different category of their own: they are specific walks focused on the visual perception of artificial light in a specific timespace, the night.

Examples of documented walks exist for most of these categories, the exception being combined walks that focus on two or more senses. The description of combined sound- and lightwalks presented in this paper is meant as a first attempt to fill this gap in the literature.

Even though their level of complexity is significantly higher, combined walks – as the combined sound- and lightwalks have shown – are highly rewarding. They contribute to a better understanding of urban sensescapes and offer new qualitative and quantitative data and knowledge about the relation between quantitative measurements and qualitative, subjective perceptional data. Therefore, further development and exploration of the specificities and the pros and cons of the various combinations seems indicated. Experimentation suggests itself along several lines, e.g.:

- Sequences of walks with the same group along the same route focused on just one sense;
- Two or more walks with different groups along the same route focused on just one sense;
- Walks focused on various combinations of two or more senses – with the same as well as different routes and groups.

Despite potential shortcomings – such as interference between senses during multisensory walks, varying (temporal) settings in a sequence of walks, inconsistencies among different groups – the quality of the results is likely to increase with further experimentation, more participants, and more varied bi- and multisensory combinations.

Increasing the number and variety of walks would lead to more systematic results and, thus, confirm the validity of the method for the joint evaluation of sound- and lightscapes – as well as other sensescapes – from a quali-quantitative perspective. Moreover, it would be a step towards "establishing a 'sensorial city planning' that is capable of defining the character and atmosphere of places" (Zardini 2016: 149) and systematically takes into account human health and wellbeing as well as the environment.

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