

Chapter 2

PERCEPTION IN MOTION – ALTERNATIVE RESEARCH TECHNIQUES FOR EXPLORING THE URBAN LANDSCAPE

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ABSTRACT

The urban environment is perceived through multiple senses in parallel, which means that visual understanding of space is aided and complemented by auditory, basic-orienting, and haptic stimuli – although mainly unconsciously. Sensory conditions are inherent attributes of urban places, but are often overlooked in research. To include these aspects in any way in analysis of the urban landscape, they need to be understood as properties of urban space, to be translated from attributes of the perceiver to attributes of the perceived. Using the relation between a designed garden and its suburban context in Bad Oeynhausen (DE) as an example, I will explore an alternative analytical methodology that takes the first-hand perspective view of the subject moving through the city as the starting point. The human body explores space by moving through it; walking is the most direct way to access, study, and research the physical qualities of the (urban) landscape, involving not only visual experience but also sound, rhythm, kinaesthesia, balance, and so forth. A notation technique that discloses the interrelation between visual qualities and their perception over time is the technique of 'scoring'. Scores are symbolisations of processes, which extend over time. They can objectively represent non-visual qualities of space, communicating the relation between such processes and their spatial context to others in other places and other moments. These representations of movement expose the qualities of the

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surroundings that change as one moves through them, thus communicating the experiential aspects of urban landscape.

Keywords: Score; time-based analysis; multi-sensory urban landscape; narrative analytical methods; perception; Wasserkrater garden; Bad Oeynhausen

1. INTRODUCTION

... The greatest treasures and most admirable things are hidden underground, and not without reason. (Rabelais, around 1564, 5.47)

The Wasserkrater garden is a suburban garden. It is a garden in a suburban context, but it is also literally placed underground, beneath the urban field, reaching down underneath the ubiquitous urban landscape. The garden is situated in the suburban agglomeration which includes the towns of Bad Oeynhausen and Löhne, near Hanover (Germany). In the sunken garden an artificial crater is set, from which a forceful water jet ejects at irregular intervals. When approaching the garden, the noise of the fountain, the risk of getting wet, the effects of light and shadow and the earthy smell of the underground space become strongly present. The different stages of entrance – building up to the inescapable downward movement of the spiral staircases into the crater – form a series of thresholds, marking the transition from the horizontal suburban field to the vertical suburban space, literally under the city. The resulting focus on the sensorial qualities of this place draws the attention to the temporal, climatic and geographic specificity that determines each place as unique.

When studying the effect that urban conditions have on the everyday life of individuals and communities, it is instrumental to start with these specificities that determine the urban landscape. To extract meaning from what we can see around us, we first need to study what it is that we see around us. What is this physical environment that people perceive day in, day out, often without even realizing that they do? What is the perceivable form of the urban landscape that creates the conditions and the organisation of the sensory experience, the source of the meaningfulness individuals and communities derive from, or attribute to, where they are? As anthropologist David Howes claimed, such a renewed attention to the senses in urban studies is not ‘simply another stream of theory to add to our academic repertoire of colonialism, gender, embodiment or material culture, for example. Instead, the senses in their supposed immediacy are the medium through which such aspects are accessed or experienced’ (Paterson, 2009, pp. 774–775). Current urban discourse has plentiful justification for taking into account a range of perceptual sensibilities as informants for understanding and working with the urban landscape. However, this accounting is difficult because of the emphasis on visuality and visual metaphors in the Western culture. ‘As opposed to the formal structures of cognition, the senses seem unreliable as [...] parameters’ (Malnar & Vodvarka, 2004, p. x). They are ephemeral, taking place in a moment in time and require human presence, and are thus of a different order than visual information. Therefore, the many ephemeral and non-visual

qualities of the environment that constitute its perceivable form receive little attention in research. Partly, this lack of attention is due to the limiting effect of traditional techniques for analysis. Traditional research methods fall short when addressing the multi-layered, diverse and ever-changing nature of the urban landscape. And that which cannot be drawn or measured tends to be overlooked. How to draw what cannot be seen? What alternative modes of knowledge production can be used?

In this chapter I will use the analysis of several sensorial conditions of the near surroundings of the Wasserkrater garden to explore an alternative analytical methodology of the urban landscape: a methodology to visually represent ephemeral aspects of the urban landscape. Its central component is the score, a technique that takes the first-hand perspective view of the subject moving through the city as the starting point for understanding the urban landscape, aiming to do justice to the multi-sensory and time-based qualities of the urban landscape, such as visual sequences, dynamics of spaces, locomotion, surface qualities and sound.

2. THE FORM OF THE URBAN LANDSCAPE AS A RESERVOIR OF MULTI-SENSORY EXPERIENCES

In Sophocles' tale of *Oedipus at Colonus*, the blind Oedipus is led by his daughter Antigone. When he asks where they are, she replies that where they now stand '... is surely sacred ground, where vines and laurels and olive trees grow wild; a haunt of birds, where nightingales make music in the coverts' (trans. 1975, p. 5). In the following conversation it becomes clear that although Antigone did not know the precise location, this combination of perceptual elements convinced her it was a divine and special place: a defined site with a spring or brook, tree grove, a flower meadow, birdsong, breeze and shade. In this place of delight smells, sounds, taste and touch play an important role alongside the visual aspect. In Greek as well as Roman literature a place with these characteristics would be immediately recognised as being divine or special. Landscape is understood here as abundance, and the perception of this fullness is multi-sensory, associated with qualities that do not belong to an eye-minded worldview, such as sound, smell and taste (De Wit, 2018, p. 403).

People relate to environments through all their senses. From the perspective of multi-sensory perception, landscape – both urban and non-urban – can be considered a reservoir of sensory possibilities, giving substance and shape to human relations and activities. The qualities of the urban landscape only become meaningful if they can be experienced. 'If there can be no form without meaning, there can be no meaning without form' wrote architect [Steven Kent Peterson \(1980, pp. 88–113\)](#), when discussing what constitutes the physical form of the contemporary city. The perceivable form of the urban landscape creates the conditions and the organisation of the sensory experience that is the source of the meanings/meaningfulness each of us derives from, or attributes to the environment. As [Arnold Berleant \(1997, pp. 2–18\)](#) noted, the interrelated and interdependent union of people and place is one of perceptual experience, which includes sensory elements, as well as memory, knowledge and the conditioning and habits

of the body and affects the range as well as the character of any environment. Whether or not we are aware of the sounds or smells that surround us, or of the quality of the light, these are part of the human habitat and enter into our perceptual experience. As architecture theorist Malcolm [Quantrill \(1987, p. 46\)](#) brought forward, people are constantly filtering the sensory input they receive, translating input into information and constructing meaning. They read places through engaging all senses, sight as well as sound, smell, taste, balance and touch; knowledge of place is a fact of (sensory) perception. Through the sensuous relationship of body–mind–environment, multi-sensory perception creates an awareness of place.

In contemporary discourse on the human relationship to the urban environment in terms of embodied experiences and affective relationships ([Hayden, 1995](#); [Massey, 1993](#); and others), the emphasis in defining perception is on the reception of sensory stimuli (information seeking), as if what we perceive is a characteristic of the perceiving subject. However, as sociologist and political scientist Eugene Victor Walter wrote in *Placeways*, sensory information is in the first place an asset of the perceived object, place or landscape: ‘A place is a location of experience. It evokes and organizes memories, images, feelings, sentiments, meanings, and the work of imagination. The feelings of a place are indeed the mental projections of individuals, but they come from collective experience and they do not happen anywhere else. They belong to the place’ (1988, p. 21). Sensory conditions, the organisation of sensory experience, are inherent attributes of urban places. Thus, the main question is not whether or how inhabitants consciously perceive what is there to be perceived – the meaning we derive from the urban environment, as an asset of the perceiver – but to unearth what it is that the place holds – as an asset of the perceived: the perceivable form of the urban landscape.

3. PROXIMATE PERCEPTION

In order to study the different aspects of perceivable form, we need to know something about how we perceive. Sensory perception of the physical surroundings is not a collection of separate experiences, perceived through different senses, but takes place through interrelated sensory systems. Psychologist James [Gibson \(1966\)](#) distinguished the visual, the auditory, the taste–smell, the basic-orienting and the haptic system. The perception of the physical landscape is a complex facility where one employs modes of perception ranging from the more direct and passive senses of taste and smell, touch and sound to active visual perception, combined with the indirect mode of symbolisation, and visual and symbolic understanding of space is aided and complemented by auditory, basic-orienting and haptic stimuli. For example, the reflection of sound can provide information about size and form of spaces (acoustics), and the amount of sound to enter from the surroundings demonstrates the measure of enclosure of a space.

The relation between space and sensory perception is defined by distance. Each sensory system has a different reach, and a different focus; some senses are

proximate, others distant. Aural cues do give a sense of distance, but sound presents a smaller world than what eyes can potentially see. In open space, sounds do not carry as far as light, and smell has an even narrower scope. Taste and touch can only be experienced upon direct bodily contact. Because weight, pressure and resistance are part of the habitual body experience, people unconsciously identify with these characteristics in the forms they see. In 1929, geographer Johannes Granö defined two realms of perception, the *Fernsicht* and the *Nahsicht* (Granö & Paassi, 1997). According to Granö, *Fernsicht* [distant view] is the part of our environment we mainly experience by vision: the landscape, determined by the horizon. *Nahsicht* [proximity] is the environment we can experience with all our senses. A distinction that Bernard Lassus (1998) described as a distinction between the tactile scale and the visual scale. Visual experience distances us from tactile experience, and it dematerialises the world. When objects are out of reach, they lose their tactility, and the world becomes a pure spectacle. Proximity on the other hand makes one attentive to the material reality of earth, pavement or walls, like mass, grain, fragility or suppleness.

Therefore, in order to perceive the material world, the tactile, or haptic qualities are central. The material reality is that which can be perceived by the haptic senses. The word ‘haptic’ stems from the Greek verb *haptein*, which can be translated by ‘grasping’, to lay hold of something: to touch, to cling, to fasten, to latch on to. It refers to the sense of touch, but it suggests a wider experience of clutching and holding that does not stop with the hands but involves the entire body, and includes temperature, pain, pressure and kinaesthesia (the body sensation and movement of the muscles, tendons and joints, as in walking, climbing, swinging or rocking). Thus, haptic perception is the active exploration of surfaces and objects, the result from how various sensibilities of the body respond to the body’s position in the physical environment. The term evokes many different ways of contact, involvement and participation, which can be divided into two distinct faculties. It refers to pressure to the skin, or literally the contact between the body and its environment, and to kinaesthesia, the ability of the body to perceive its own motion. Haptic perception can be described as ‘the way the whole body senses and feels the environment [including] our feelings of rhythm, of hard and soft edges, of huge and tiny elements, of openings and closures, and a myriad of landmarks and directions’ (Bloomer & Moore, 1977, pp. 34–36). Haptic cues refer to both space and substance and provide a location and orientation in relation to the place we perceive. Since haptic perception is participatory, active and passive at the same time, it reminds us that we are not only observers of the world but also actors in it. Haptic perception is about both an awareness of presence and of locomotion – a combination of tactile and locomotive properties, engaging in feeling and doing simultaneously.

4. WALKING

The corporeal awareness of the presence of the observer in space in combination with the action/reaction characteristic of kinaesthetic experience – the sensation of movement – are primarily responsible for the understanding of three-dimensional space. The human body can explore space only by moving

through it. As Gibson (1966) stated: ‘Not only does [locomotion] depend on perception but perception depends on locomotion inasmuch as a moving point of observation is necessary for any adequate acquaintance with the environment. So we must perceive in order to move, but we must also move in order to perceive’ (p. 223).

In 1970 the land artist Robert Smithson created *Spiral Jetty*, a spiral of rock and earth, reaching out from the shore of the Great Salt Lake in Utah, which, through its isolation, addresses aspects of nature, time and endless space (Fig. 1). The Spiral Jetty is hard to reach, and the intense awareness of space and time is gained by a combination of the visual image of the weird shimmering air above the pink lake, and the bodily sensation of attempting to keep or regain a foothold when negotiating the rocks of the partially submerged jetty, and the feeling of the crusts and algae underfoot that are accumulated during long alternations of low and high water levels. In the vast, desert-like landscape the natural forces are evident. This artwork seems a totally different project from the photo essay Smithson had created only three years earlier, *The Monuments of Passaic*, a photojournalistic documentation of moments such as a parking lot, a sandbox, the concrete abutments of a highway-in-progress, a pumping derrick partly supported by pontoons and a set of six pipes – which he viewed as a horizontal



Fig. 1. The Spiral Jetty, by Robert Smithson (1970). The artwork can only be experienced by walking to and over it. Negotiating the irregular rocks, one experiences the effects of time and nature. Source: Photograph by Sebastiaan Kaal (2011).

fountain – that pumped water from a pond into the river (1967, pp. 48–51). The New Jersey city Passaic is a car-oriented suburban/industrial landscape, hardly accessible on foot. Instead of viewing the mosaic of urban fragments on the map or the blur of passing ‘pictures’ of the landscape that one would normally see when sweeping past in a car, Smithson chose to approach the urban landscape from the intimate vantage point of the pedestrian, physically immersing himself inside these ‘pictures’. This allowed him to appreciate similar wilderness qualities in the ‘gaps’ in and between the suburban and industrial fragments of Passaic as in the natural landscape of the Great Salt Lake. The physical experience of walking along the virtually inaccessible banks of the Passaic River allowed him to literally enter a temporal and perceptual ‘elsewhere’. Comparing these two artworks shows the value of the conscious act of walking to disclose qualities of the urban landscape that remain otherwise hidden. These sensory conditions can be seen as inherent attributes of the urban landscape, which serve as a stimulus or catalyst for the transaction between people and space.

Walking is the most direct way to perceive the (urban) landscape, which not only involves visual experience but also includes the perception of sound, rhythm, kinaesthesia, balance and so forth, a multi-sensory, active interaction with the urban landscape, rendering the landscape a structure of spaces seen as well as felt, touched and heard. In walking we move into a near-sphere of our own choosing, which puts an emphasis on the materiality and the perception thereof: haptic perception. Thus, when attempting to ‘capture’ the city, walking can be an excellent tool, an embodied way of knowing. As Mark Paterson elucidated: “‘a tactile perception of space’ is a good starting point for an embodied ethnography of walking, thinking of our embodied everyday stance not as the separation of mind from body, head from feet, but as diverse strands of sense returns from limbs, viscera, sense organs and muscular movement that variously combine as an almost elastic sensory-spatial envelope, a sensorium in action’ (2009, p. 777).

Walking the urban landscape is the enfolding of a spatial sequence, like a narrative. The writer Rebecca Solnit (2001), author of *Wanderlust: A History of Walking*, explains ‘Part of what makes roads, trails, and paths so unique as built structures is that they cannot be perceived as a whole all at once by a sedentary onlooker. They unfold in time as one travels along them, just as a story does as one listens or reads, and a hairpin turn is like a plot twist, a steep ascent a building of suspense to the view at the summit, a fork in the road an introduction of a new storyline, arrival the end of the story’ (p. 201). When discussing the role of walking as an instrument to read landscape form, landscape historian John Dixon Hunt (2003) suggests the procession as ‘a ritual movement that follows both a preordained path and purpose, which is, on account of its prescription, repeatable on innumerable occasions’ (p. 188), posing that a subject moving through space needs the help of prescriptions laid down in formal records such as social or religious convention or written text. I would suggest on the contrary that it is (the haptic properties of) the physical landscape itself, not any type of formal record, which is the prescription. These properties provide the clues to the choreography of space; the messages of the theatrical staging of squares and streets, the steepness of slopes, steps, entrances and vistas provide the events for the

narrative. But where a written narrative unfolds in time and the space for its action is merely suggested; in the urban landscape the organisation of space is real and is the property that suggests or generates the time dimension, by establishing a sequence of movement through it.

However, the act of walking is only the first step in an analytical methodology of drawing out the perceivable form of the urban landscape. To disclose the sensory conditions as physical information to be found in urban landscape, these conditions need to be linked to the formal/physical components of urban space, and they need to be translated from attributes of the perceiver to attributes of the perceived. This asks for these two interrelated actions: walking and notation.

5. SCORING

It is relevant to be aware of the limitations and influence of notation techniques. More than representations of analytical content, notation techniques determine the limits of the analysis. They control what happens, as Lawrence Halprin (1969) explained, and he recounted that when the American avant-garde composer John Cage was asked: ‘When you compose do you think notation first or sound first?’ he replied: ‘Both constitute inseparable entities, I cannot separate them’ (p. 11). Thus, in a methodology that has walking, kinaesthetic experience, at the basis, the accessory notation technique is inseparable from the specificities of moving along a line. Whereas traditional analytical drawing techniques for urban spatial analysis, such as mapping, have space at the basis, this unfolding in time entails that notation techniques that represent perception in motion need to have time at the basis.

In the 1960s and 1970s, urban planners such as Gordon Cullen, Edmund Bacon and Kevin Lynch devised alternative notation techniques for analysing and designing that took the eye-level perspective view and the multi-sensory and time-based experiences of the subject moving through the city as the starting point. As is the case today, ‘classical’, top-down steered analysis, design and planning instruments were put into question during this period, as a result of changing cultural, social and economic circumstances that called for a revision of the discipline (Havik, Notteboom, & de Wit, 2017, p. 3). Donald Appleyard, Kevin Lynch, and John Myer (1964) devised their own scoring techniques to analyse the experience of moving along the motorway in their seminal analysis *The View from the Road*. They drew sets of several sequence diagrams, each highlighting a specific property of the visual spatial experience related to movement in a car, to extract and compare the different aspects of visual-spatial experience: sense of motion and space, orientation, proportion and scale, light. Likewise, Gordon Cullen (1961) and Edmund Bacon (1974) created serial visions, or visual sequences, of the spatial-visual conditions of the urban landscape (Fig. 2). Contrary to common interpretation, it is significant to note that their drawings are not merely representations of visual impressions, but sequences of ‘sensations’ (in Bacon’s words) or ‘revelations’ (in Cullen’s), bearing witness of all kinds of human interaction with space, of periodic occupation and appropriation

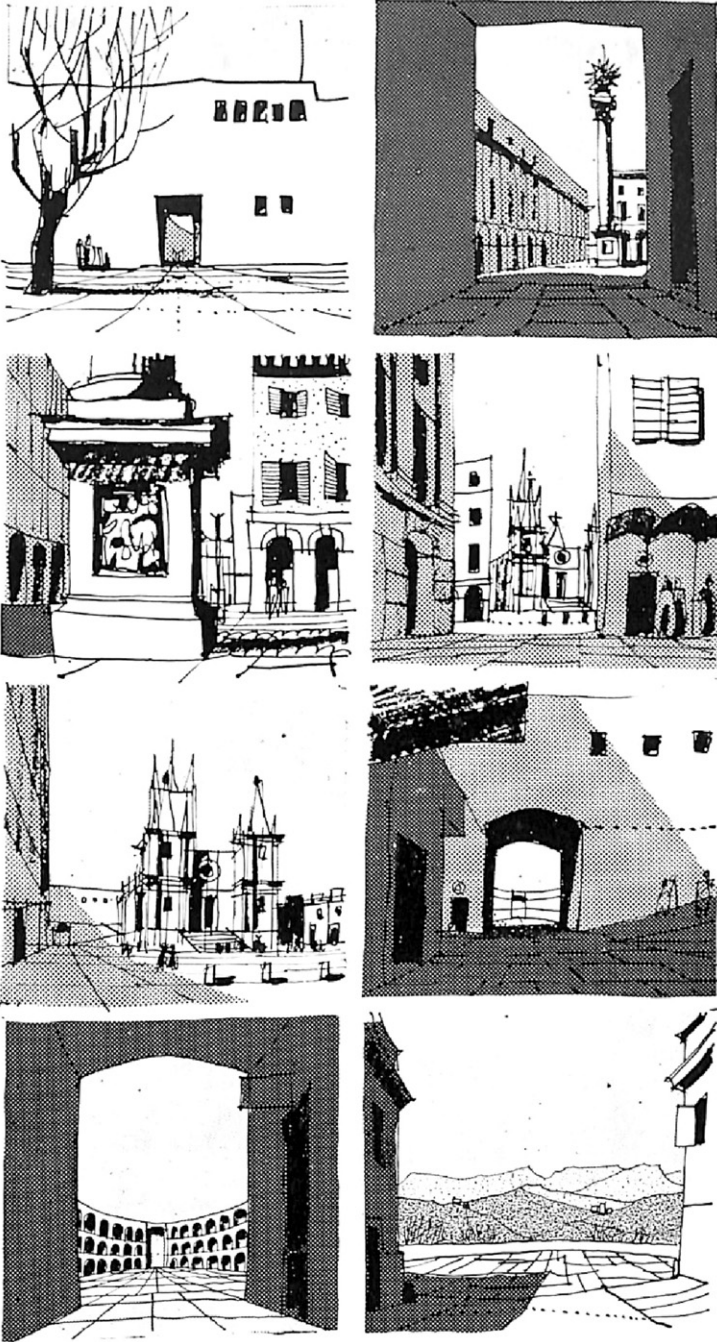


Fig. 2. Serial Vision (Gordon Cullen, 1961). 'To walk from one end of the plan to another, at a uniform pace, will provide a sequence of revelations which are suggested in the serial drawings [...] The even progress of travel is illuminated by a series of sudden contrasts and so an impact is made on the eye'. (Gordon Cullen, *The Concise Townscape*, The Architectural Press, 1961, p. 17).

of space, and of social interaction informed by spatial characteristics. These serial visions are registrations of the visual-spatial aspects of the landscape that are disclosed by locomotion.

However, to consider the multi-sensory aspects of the physical surroundings we need to expand the possibilities of these time-based registrations. In the same period as the above-mentioned group of urban planners, the American landscape architect Lawrence Halprin attempted to find a notation technique to include experience and perception in spatial design. Halprin's wife Anna was a choreographer and inspired by the close relationship Halprin thus had to dance and theatre, the choreography of movement became a key notion in his designs. In the 1960s he invented a personalised ideographic system, using 'scores' to choreograph the movement of elements in urban parks, plazas and cultural centres (Fig. 3). Derived from the traditional musical score, scores are symbolisations of processes, which extend over time. Halprin (1969) devised scores for all fields of human endeavour, such as street scores, ecological scores, city scores and community scores. Communicating processes over time and space to others in other places and other moments, such scores can indeed objectively represent non-visual qualities of space. The essential difference with classical analytical drawings is that time, rather than space, is the framework. Halprin invented the word 'motation' for the particular type of score that represents motion, movement in space.

Whereas Halprin's scores took the actor as the subject (similar to the scores used in dance and theatre), as a research tool they can be pushed further by taking the physical landscape as the subject: a shift from how people act and perceive in space to how space and place can determine action and perception. In this way scores can be employed to register various aspects of a route, to objectify personal experience as the basis for site analysis. By dissecting experiences during and after walking different routes, several modes of perception can be translated into diagrams to express, for example, turns in the road, ascents and descents, road crossings, as well as spatial proportions, sound and vision. In order to grasp the relations between the several perceptual properties, these diagrams can be synchronised by drawing them as diagrams of a stretched surface section, with a horizontal axis representing the distance (which is the unifying factor), and a vertical axis representing the change in perceptual quality.

6. DIFFERENT SENSORY COMPONENTS

Let us take a closer look at the example we started with, to explore different possibilities for analysing the sensory qualities of the urban environment. The medium-sized town Bad Oeynhausen in Germany is part of an expansive sub-urban agglomeration (Fig. 4). In the centre of town a large fountain taps into the underground water source, as a reference to the town's origins as a spa town. From this fountain, the Jordansprudel, we walk to Park Aqua Magica (Agence Ter), created in 1997 to give an impulse to region and reconnect to the thermal history. At the centre of the park is the Wasserkrater garden, a sunken space

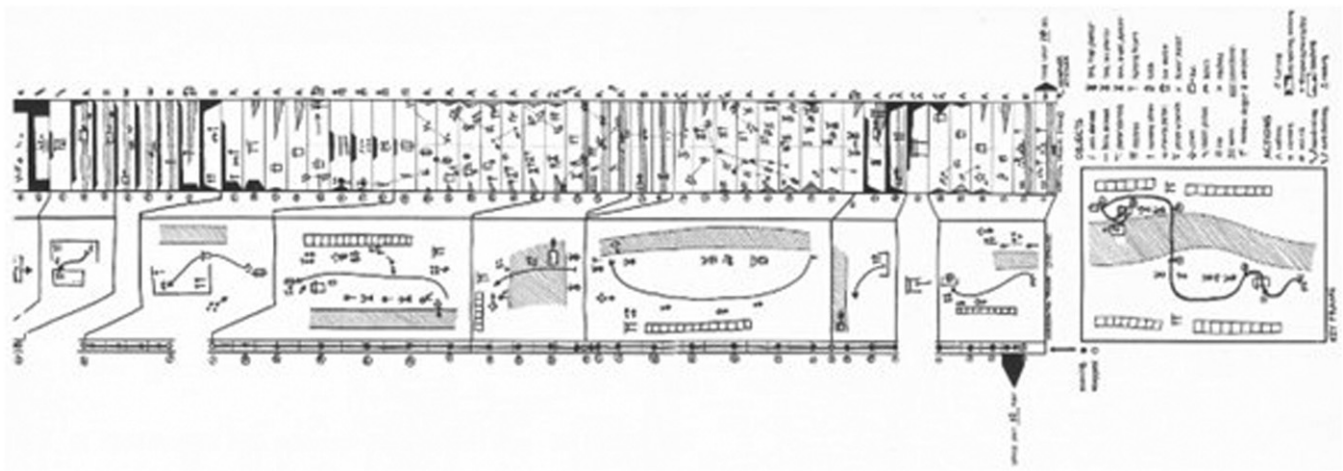


Fig. 3. Motation Score of Nicollet Mall Between Sixth and Seventh Street. For his conversion of Nicollet Mall, Minneapolis' main shopping street, into a pedestrian space, Halprin observed and analysed how people moved through space (Lawrence Halprin, 1969).
Source: © Lawrence Halprin Collection, Architectural Archives, University of Pennsylvania.



Fig. 4. The Suburban Landscape of Bad Oeynhausen. *Source:* Photograph by Sebastiaan Kaal (2012).

around a large water jet that erupts at irregular intervals, created to expose the invisible underground water landscape (Fig. 5). The route is a collection of existing and new roads, paths, stairs and bridges, a sequence of events, with the beginning and the end emphasised by the two fountains. Walking from fountain to fountain would take at a leisurely pace 10–15 minutes.

To unravel the information that can be gathered on such a walk, I visited Bad Oeynhausen on several occasions and in different weather conditions, each visit making the walk from the Jordansprudel to the Wasserkrater. Walks like this are best conducted in pairs, so each change in visual cues, sounds and body equilibrium can be noted, voiced and discussed. During the walk, maps were used to annotate the location and quality of each change, and photographs were taken to document them. Later, these notes were translated into scores, with the aid of cartographic information to objectively document locomotive aspects.

The most straightforward is a traditional score such as the ones created by Cullen and Bacon: the visual score. As an analytical tool they go beyond registration, they are informed interpretations, singling out those spatial cues, which are crucial for the scenography of the routing: composition elements that direct the line of movement: landmarks, incidents, thresholds and gates. The vertical jet of the Jordansprudel forms an explicit landmark. Next, a bridge over the forested railway ravine provides a view into the far distance of the train lines. The path continues through a natural valley, and a gabion wall points to a simple set of



Fig. 5. The Wasserkrater Garden, With the Central Steel Crater Viewed From the Sunken Space of the Surrounding Garden. Source: Photograph Sebastiaan Kaal (2012).

stairs, out of the valley into the park. The wall is the first of a series of gabion walls that brings coherence and direction. In the park the route becomes more obvious, ending with a view out over the open agricultural landscape. Among several circular plantations, one that seems but a low clump of shrubs subtly marks the position of the Wasserkrater garden. At times the erupting jet of water attracts the attention and indicates there is more to it than a clump of shrubs. The clump turns out to contain a sunken garden planted with serviceberries (*Ame-lanchier lamarckii*), and the depth of the garden is such that the canopy reaches the level of the upper edge, reproducing the horizon of the terrain. The jet directs the visitor away from the path to a ramp that leads down into the garden, making it the inevitable culmination of the routing. From the moment of entering the garden, the visual fields are shifting. Viewed from the park the garden was obscured by the treetops below eye level, directing a horizontal view, but upon entering the garden the view is directed downwards, as one can only do when descending. In the garden the tree canopy creates a low ceiling and again directs the view horizontally. Once inside the sunken garden, the visitors find their way over a scattering of stepping stones in a carpet of plants, to one of the two narrow slits with heavy doors in a steel circular wall. Here, a platform like a balcony offers a view to the space below. The crater directs the view downward, into the earth, and the eyes are drawn to the spectacle of the fountain below. Upon entering, steep spiral stairs lead down to the bottom of the crater, where the

fountain directs the eyes upward to the sky. The defined space creates a connection to the natural space – both above and below ground – in the field of undefined and fragmented space of the suburban landscape (Fig. 6).

Much of the spatial-visual information that is perceived by the different faculties of the human body transcends what can be represented in perspectival images, the information that addresses the haptic component of spatial dynamics: the sequence of shapes, dimensions, proportions, arrangements and depth of volumes, textures, flexibility and continuity of surfaces relative to the human scale. This property deals with the distance from the perceiver, either in terms of direct or indirect reach, and direction relative to our body orientation: front, back, right, left, up and down. Our tactile awareness of walls and doors, compression and expansion provide the ‘bodily measurements’ (Scott, 1999, p. 228) with which people understand space. Taking a detour from the Bad Oeynhausen narrative, two scores of the Tofuku-ji temple ensemble in Kyoto highlight the difference between the visual and haptic properties of space. While the material differences between built area, park area and garden in Bad Oeynhausen puts an emphasis on the visual aspects of the sequence, the Kyoto suburb, the Tofuku-ji temple ensemble and the temple garden are all composed of white stucco walls, gabled roofs, trees, gravel and wood. These architectural components have a similar visual appearance (at least to the Western eye), but the spatial proportions show a contrast between the half-open suburban landscape and the defined enclosures of the temple ensemble that goes beyond the visual image. Contrary to the filmic sequence of discrete moments that the visual score presents, these non-visual spatial dynamics can be represented as a continuous diagram, representing the change in measure of enclosure (Fig. 7).

Returning to Bad Oeynhausen, several kinaesthetic and auditory cues complement and augment the image sequence: the rising and falling of the surface of the earth, the meandering and curving of the path, and the sequence of sounds, with the roaring fountain of the Wasserkrater as the grand finale, reflecting the splashing Jordansprudel at the beginning. The transition from urban area to wooded valley is seen as well as felt by a tight combination of climbing and descending, a sharp change in direction, a quick succession of material changes and an intensification of quality as well as quality of sound.

The locomotion score addresses these dynamic properties of the ground plane, which can be perceived through ascent and descent, moving left or right, straight ahead or turning back, factors of the site which influence bodily position, as interpreted by the vestibular organ. The resulting orientation leads the body to seek a symmetrical balance, and our senses are always directed to that end. Landscape features are often described by names that reflect this ‘muscular consciousness’, such as a road to be ‘climbing’ a hill or ‘descending’ into a valley, as though ‘the road itself has muscles, or rather, counter-muscles’, as Gaston Bachelard writes (1958/1994, p. 11). For analysing the locomotion score, the vestibular organ is used as measuring device and then removed from the representation, in the same way instruments are not shown when presenting results. The line of movement towards the Wasserkrater garden meanders slightly in the valley, in the park it is constructed of straight path sections and finally in the



1. The Jordansprudel is the landmark of Bad Oeynhausen.



2. The bridge over the railway is transformed into a wide square, facilitating the crossing.



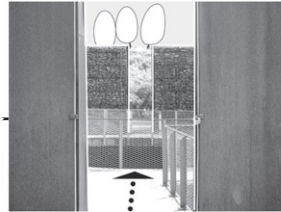
3. Exit of stream valley into park, guided by a gabion wall.



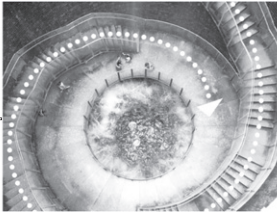
4. Ramp into the valley.



5. Free movement on the valley floor.



6. Narrow slits frame the last view to the surroundings, before descending into the crater.



7. Two stairs spiral down to the floor of the crater.



8. All the way down the view is focused on the water jet, for fear of getting wet.

Fig. 6. Visual Score of the Walk From the Jordansprudel to the Wasserkrater. The route is indicated by a dotted line, the objects that frame the space and guide the direction are highlighted by a continuous line, and the elements that catch the eye are shown as a white volume.

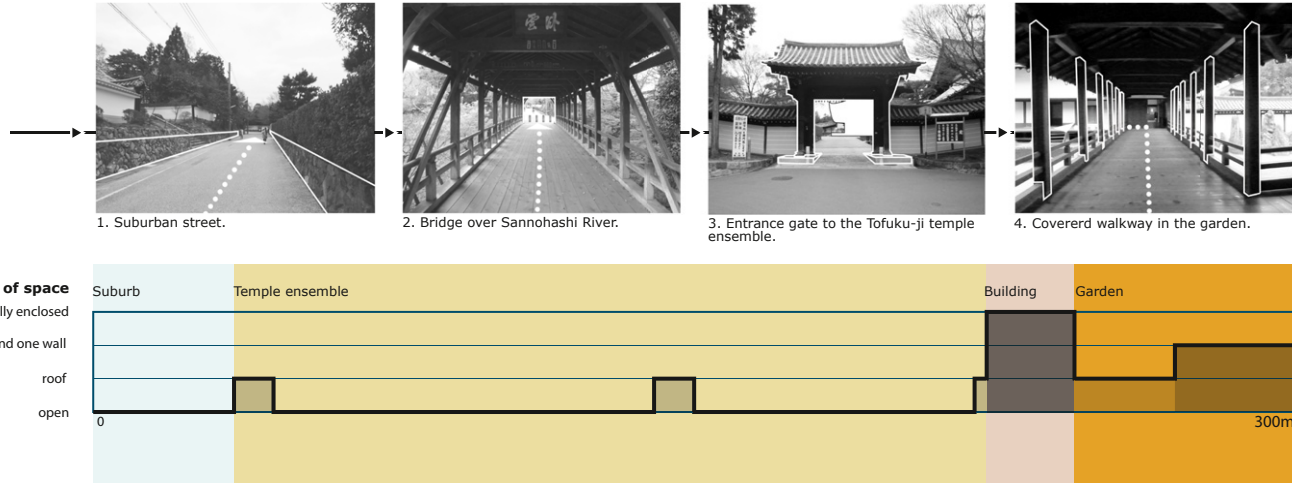


Fig. 7. Visual Score and Haptic Score of the Tofuku-ji Temple Ensemble in Kyoto. The haptic score shows how each transition from one area to another is marked by an enclosure, and how the sizes of the spaces become smaller toward the garden.

garden it is transformed into a spiralling movement, gently at first in the path of stepping stones and then more forceful in the spiral staircases, as an expression of the downward movement. Likewise, in the garden the height differences become larger and steeper and are architecturally elaborated as stairs and ramps (Fig. 8).

The accessory plane that defines the haptic dimensions of space is the surface underfoot. As the primary physical platform for locomotion and spatial perception, the surface underfoot is the most direct embodied contact with the space around us, guiding our position in space. It is the material we feel all the time when moving through space without making a conscious effort, which helps us in finding our way, guiding our direction, recognising where we are. As Ana Luz (2008) concluded in her research on landscapes, the surface underfoot reflects the environment we are in, and cues in surface material can provide functional information such as hazards or boundaries, differences in programmes of use and domains of private or public thresholds. The material underfoot can also function as a prompt to movement. In many cases, material qualities of different textures, the directionality and scale of the material form and pattern can (un)intentionally send the message to move on or encourage a person to stay and pause for a while. To be interpreted as a prompt, pavement form does not need to be particularly eye-catching or obvious. People perceive the ground they walk on without seeing it, and it is precisely the hidden location of the ground, in its non-frontal way of seeing, that opens up our perception of the world (p. 96). The surface underfoot score documents these properties, including texture, roughness or smoothness and details of surface variation. Firm surfaces require little attention to negotiate; the more muscular and vestibular effort they require, the more awareness of one's surroundings they provide. On one end of the scale are smooth and slippery surfaces, and on the other end, soft, bumpy, loose or rocky surfaces. The transitions from town to valley to park to garden are underscored by material transitions, and the alternation of loose and hard materials underfoot gives the route a rhythmic undertone, which, parallel to the locomotion score, culminates in the moment one enters the garden: steeper slopes, stronger curves and more unstable surface (Fig. 9).

The auditory score represents most explicitly how the Wasserkrater garden, although physically distant, is intimately connected to the town and its origins. The sound of the Wasserkrater recalls the Jordansprudel, with its alternation of sound and quiet, and its drowning of all surrounding sounds. Near the Jordansprudel in town, the sound of the water is so loud that nothing else can be heard, but already at a little distance it merges with the daily urban sounds – a tolling church bell, people and cars. In the valley and the park, the sound of birds forms a continuous background. The Wasserkrater fountain provides the most conspicuous sound on the plain, but its volume does not rise above the volume of the background sounds of the almost continuous airplanes, of the intensive bird singing, of children playing and people talking. Its sounds may be heard at about 50 metres from the edge of the sunken garden, but only inside the garden the fountain is clearly audible. In the intervals between the eruptions of the fountain, the sunken garden appears to be quieter than the surrounding plain, although the sound level is only slightly lower – the volume of the fountain indeed becomes

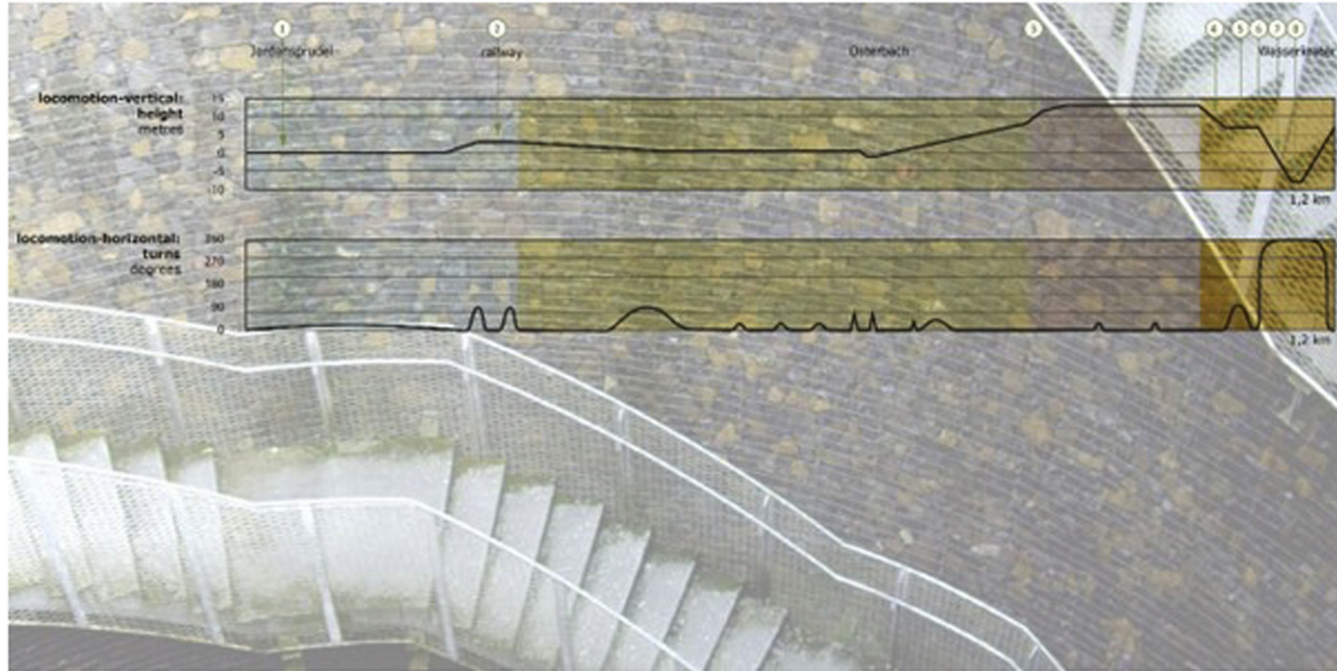


Fig. 8. Locomotion Scores. The sequence from built-up area, valley, park to garden is indicated in shifting shades. The vertical movement is shown in meters, the horizontal changes in direction are shown in degrees. The abrupt changes in height and direction are an intensification of the gradual changes in the urban landscape.

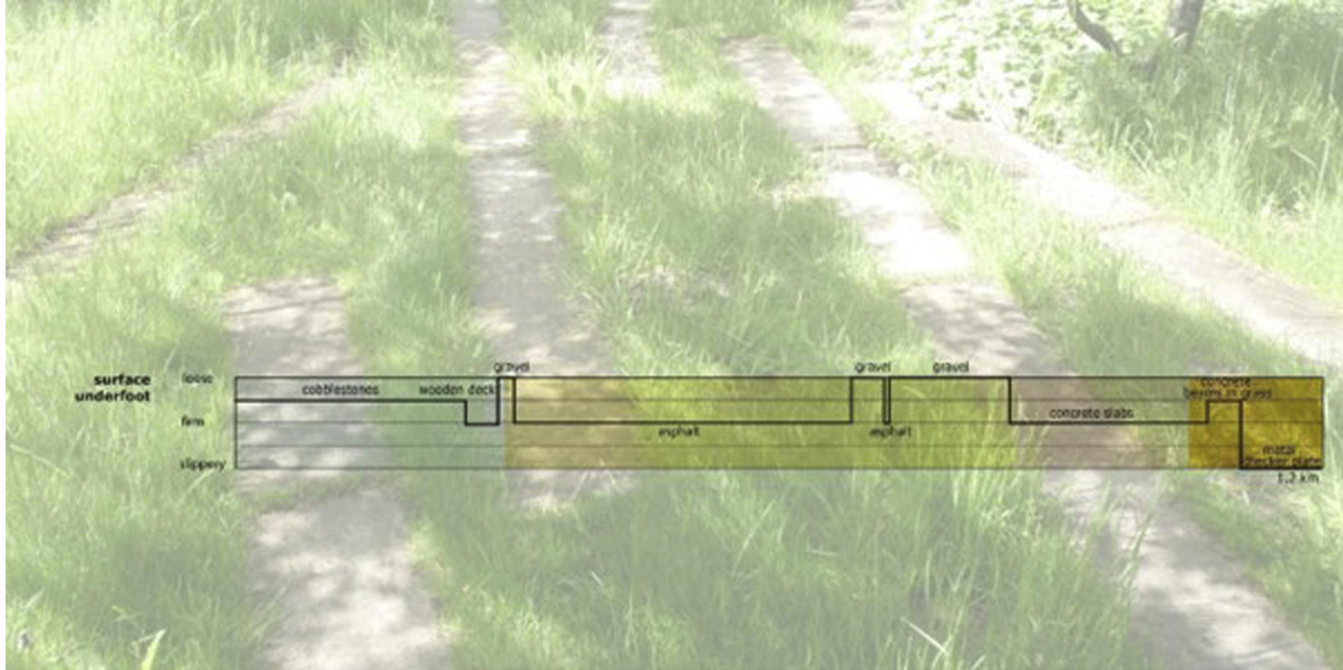


Fig. 9. Surface Underfoot Score. The centre line marks firm surfaces that require little attention to negotiate. On one end of the scale are smooth and slippery surfaces, and on the other soft, bumpy, loose or rocky surfaces that require more muscular and vestibular effort.

louder, but the high-pitched background sounds (the human vocal sounds) become muffled; the bird sounds and the wind remain. Here, the tree canopy muffles the sound of the water, while the hard materials inside the crater echo the thundering sound of the fountain and sharpen the sound of the falling water on the stairs. Only within the confines of the crater wall, where the background sounds have disappeared altogether, the differences between the sound levels of the eruptions and the intervals are substantial, and down at the crater floor the different stages of the soundscape can be clearly distinguished. In the intervals the dripping becomes audible, a sharp rattle on the metal stairs, gradually lessening until the fountain erupts again: a heavy bubbling raises the sound level, rising even more, followed by a sound explosion, retained by the enclosure of the space. The score shows how intimately related auditory information is to spatial composition: only when entering the open space of the park, the wind becomes noticeable, and the little ‘hiccup’ in the score indicates the narrow entrance to the crater: the acoustic space of the fountain is to a great extent determined by the geometry of the garden, making it aurally perceptible. The impact of the fountain on the soundscape draws the attention from the visual to the multi-sensory qualities of the garden (Fig. 10).

7. CONCLUSION – FROM KINAESTHESIA TO SYNAESTHESIA

The perceivable form of the urban landscape is more than its architecture and more than volumes or voids defined by a series of surfaces. It consists of physical as well as ephemeral and structural components. John Dixon Hunt (2017) wrote: ‘We must evade simple reliance on architectural forms. Movement determines mood. The mood is lost when we just look at forms’ (p. 13). The perceivable form concerns the shapes, dimensions and proportions of space, and the materiality, the plasticity of topography, planting, and buildings, their visual, haptic and acoustic properties, as well as the interrelations between them which can only be perceived in movement. The human body can explore space only by moving through it; it needs perception in order to move, but perception depends on our moving through space at the same time.

Moving through space not only exposes kinaesthetic information that can be derived directly from the movement itself, but all kinds of interwoven, synaesthetic information. Synaesthesia literally means ‘joining of the senses’. Neuropsychological theories of synaesthesia treat the phenomenon of intersensoriality (hearing colours or seeing sounds and other such forms of cross-modal stimulation) as a rare genetic condition which has to do with the brains of certain individuals being ‘cross-wired’. However, synaesthesia is something that happens on a daily basis and in daily life. The physical environment feels ineluctably tactile, even though we touch only a small part of it. Tactile experience, the sensation in the skin or muscles, also includes the kind of visual experience that leads to anticipate these tactile qualities of the surroundings – seeing the spray of water makes one imagine getting wet and hearing it roar creates a mental image

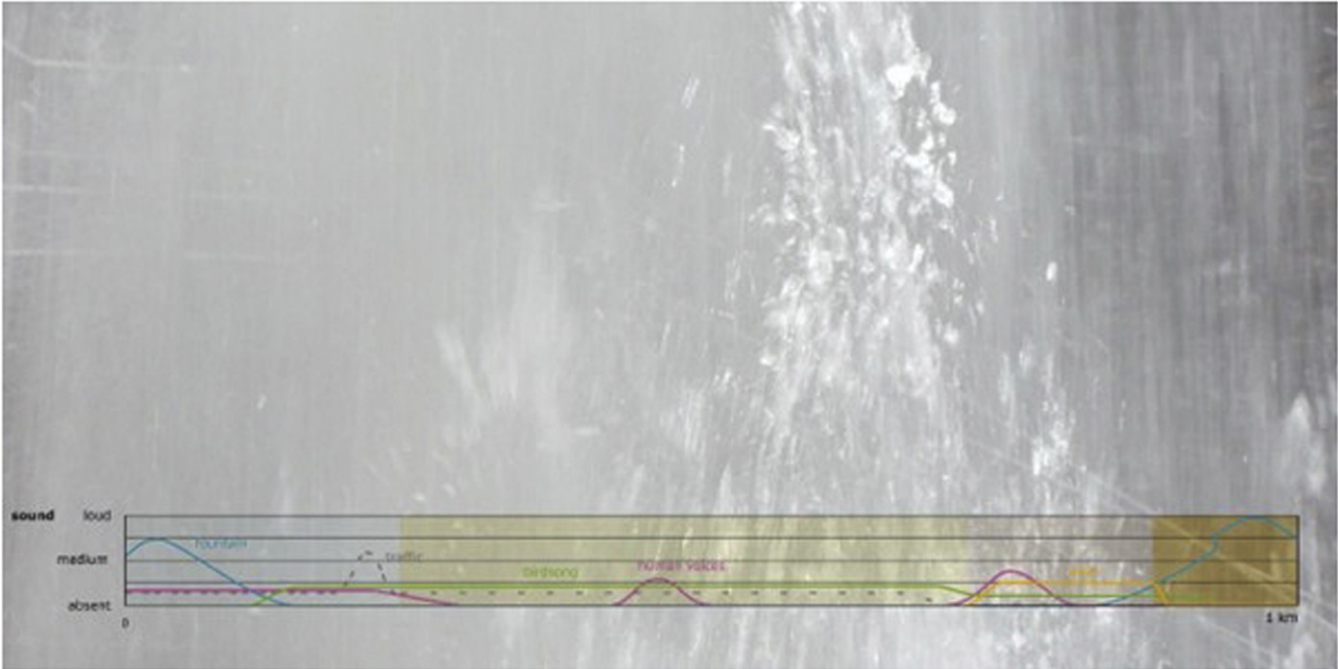


Fig. 10. Auditory Score. The different sounds of falling water, traffic, birdsong, human voices and wind gain importance in turn.

of a fountain. The muscle effort to bridge a distance provides a sense of space interconnected with perspectival, auditory and tactile information. The sensory faculties are inseparable; they are linked in a multi-directional interaction where one sensation follows another to form different patterns of experience (Howes, 2006; Tuan, 1993, p. 43).

What the combined visual and haptic scores show is how this synaesthetic faculty can be translated from the perceiver to the perceived: the way we can derive meaning from the urban environment. The images, or even the experiences of the urban landscape, only provide meaning by their interrelation, in a sequence of bodily perceived moments (kinaesthesia). Where the perception of the urban environment is often reduced to a visual one, the condensation of haptic cues in the urban landscape makes it a synaesthetically perceived sequence of ambiances, where a combined input of changes in light, textures, sounds and dimensions of space are joined into one. Such representations of movement are valuable in the sense that they expose not the movements themselves, not the subjective experience, perception, or meanings, but the conditions that the urban landscape offers, the qualities that change as we move through them, thus communicating the experiential aspects of urban landscape. In other words, although the faculties of the human body are used as measuring device, the focus, the content, of such analysis is the urban environment. It is an essential quality of these multi-sensory cues that they are not defined images with an associated meaning; they are bodily perceivable kinaesthetic events, which remain abstract in the sense that they do not dictate the relation between urbanites and their environment, but allow for each inhabitant, visitor and researcher to perceive, create and allow to evolve their own narrative.

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