11. The Atmosphere in Open Public Spaces
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Part IV: Research for design: 'Building Blocks from Outside'
The Atmosphere in Open Public Spaces

Harry van Vliet

11.1 Introduction.

A space’s atmosphere is an important factor in how that space is experienced. In fact, festival visitors consider the atmosphere as the most important factor in how they experience a festival (Van Vliet 2012). Atmosphere is also what distinguishes physical shops from online web shops (Van Vliet, Moes & Schrandt 2015). Much research underlines the influence of atmosphere on cognitive and emotional processes. As early as 1956, research showed that an assessment of facial expressions in photographs depended on the atmosphere of the space in which the photos were viewed (Maslow & Mintz 1956). The importance of atmosphere inspired the search for ways to influence visitors and allowing them to react to, and even (co-)design, a space’s atmosphere – from museum spaces (Noordegraaf 2012) to urban spaces, from consciously-manipulated spaces to the now inevitable layer of digital information that has entered the public sphere (Mitchell 2005).

Researchers have been studying the influence of atmosphere for decades, particularly through the lens of environmental psychology, which focuses on the interplay between humans and their environment (Mehrabian & Russell 1974; Steg, Van den Berg & De Groot 2012). A milestone in atmosphere research was the introduction of the concept of ‘atmospherics’ by Kotler (1973). From here, research into atmosphere mainly took place in the context of marketing research into consumer behaviour in shops and service environments such as restaurants, hotels, museums and festivals (Van Vliet 2014). The question here is whether these gathered insights contribute to understanding how atmosphere works in open public spaces.
11.2 Atmosphere: studied and explain.

A considerable amount of research into atmosphere focuses on cues: the specific characteristics of spaces that (might) determine the atmosphere experienced. Of these ‘cues’, the influence of music has received the most attention. For example, the music’s tempo has been shown to influence the consumer’s pace in a shop, the number of purchased products and how long they spend in the shop. A piece of music’s familiarity influences the experienced length of stay in a shop and while waiting in line. By creating a pleasant mood, music indirectly influences product choice and exploratory behaviour in a shop. Other studies show how pleasant scents in a shop can influence experienced length of stay, number of purchases and exploratory behaviour in the shop – for example, the smell of chocolate in a bookshop can have a positive effect on the number of cookery books sold. Besides music and scent, other factors such as colour, light, product placement, product information, shop interior and shop assistants’ behaviour can all influence how atmosphere is experienced and the consumer’s buying behaviour (Turley & Milliman 2000; Olahut, El-Murad & Plaias 2012; De Farias, Aguiar & Melo 2014).

In order to explain these and other results of atmosphere research, the S-O-R (Stimulus – Organism – Response) model from environmental psychology is often cited: environmental stimuli (S) are processed by an organism (O), which results in the showing of a response (R). While the S-O-R model is adapted to many empirical studies into atmosphere, the concept does have serious limitations.

When it comes to environmental stimuli (S), the umwelt is so richly filled with possible stimuli and information that can directly or indirectly influence a person’s thinking, actions and feeling that it’s impossible to chart out all the possible influences and possible interactions. Even a relatively clear and orderly environment such as a shop is already an endless ‘group of cues, messages, and suggestions’ (De Farias, Aguiar & Melo 2014, 87). This flood of information is often dealt with pragmatically by splitting up the possible stimuli into groups – such as ‘ambient’, ‘design’ and ‘social factors’ – so statements can be made on these categories. Another approach is to take a holistic view. When you walk into a space, it’s not as if you are just hearing music, smelling something or feeling the temperature. You are actually getting an overall impression of the space by absorbing all these different factors. In a fraction of a second, a space already provides an impression – ‘we grasp the atmosphere before we identify its details or understand it intellectually’ (Pallasmaa 2014, 232). Hence,

Motivation, mood, attention, involvement and social context are just a few of the factors that clearly influence the experience of atmosphere.
people are often asked about their general impression of the space – even though it’s often the case that the researcher’s actual interest stems from the effect of a particular intervention.

The S-O-R model argues that environmental stimuli ensure that the environment ‘does’ something with a person (the ‘O’) in that environment, and specifically with the emotional state of that person. This emotional state is often described through the PAD model (Mehrabian & Russell 1974). However, this view of emotions is not without its problems (Van Vliet 2018). Various studies have also made clear that the ‘O’ is more complex than what can be uncovered by mere measurement of, for example, arousal. Other factors such as motivation, mood, attention, level of engagement and social context can also measurably influence how atmosphere is experienced.

Within the research, the response (R) is made up of a collection of measured (dependent) variables, such as sales, time spent in the shop, number of observed items, purchasing, purchase intention and purchase attitude, along with more general variables such as enjoyment, satisfaction and loyalty (Turley & Milliman 2000, among others). Nevertheless, there is one important recurring view that responses to an environment can be described as ‘approach’ or ‘avoidance’ behaviour. ‘Approach’ designates wanting to stay in a space to explore; ‘avoidance’ represents not wanting to explore and leaving. This division can be further anchored in research into emotions and hereby seems to be a primary concept when describing the experiencing of atmosphere of a space (Van Vliet 2018).
11.3 New starting point.

For the most part, research into atmosphere in other sectors besides retail, builds on earlier research and theorising around the consumer experience in shops – and thereby also ‘inherits’ the same problems and shortcomings. This not only includes the weaknesses in the theory behind the S-O-R model, but also how research results don’t always point in the same direction – and are, on occasion, even contradictory. This can be partly traced to differences in the operationalization of the constructs, the applied research methods and the specific situation wherein the data is gathered. At first glance this state of affairs may seem disappointing for the describing of atmosphere in public spaces, but the exposed weaknesses actually offer an opportunity to give form to new ideas around atmosphere in open public spaces. In other words: we can learn the most from theoretical shortcomings.

Here, we will focus on three aspects – motivation, responsiveness and perceivedness – that we can then use to interpret the atmosphere of public spaces.

A first recurring factor when it comes to people entering a space is their motivation for being there. The difference between ‘hedonistic’ shopping (‘for fun’) and ‘utilitarian’ shopping (‘task related’) can be totally different starting points for the shopping experience (Van Vliet 2014) and lead to a different experience of the atmosphere (Rayburn & Voss 2013). A study by Kaltcheva & Weitz (2006) showed that consumer motivation is an important moderator in the effect of a shop environment’s generated ‘arousal’. With a more recreational motivation to shop, the generated ‘arousal’ has a positive effect on the experienced pleasure; while with a more task-oriented motivation the generated ‘arousal’ has a negative effect on the experienced pleasure.

Secondly, individual differences can play a role in the experiencing of atmosphere. The influence of a person’s characteristics on their experiencing of a space forms a recurring theme in atmosphere studies from Mehrabian & Russell (1974) through to Forest (2014). Research has been done into ‘environmental dispositions’: the differences between people in how they interact with an environment. The most well-known measuring instrument is probably the Environmental Response Inventory (ERI) from McKechnie (1970; 1977), which consists of 184 statements about everyday situations. In addition, a specific disposition has been put forward in terms of atmospherics: ‘atmospheric responsiveness’, characterised as the level of how sensitive people are to environmental stimuli (Eroglu, Machleit & Davis 2001).

Thirdly, an essential distinction must be made between ‘intended atmosphere’ (what the designer attempts to evoke through his design) and the ‘perceived atmosphere’ (how the atmosphere is actually experienced by consumers). In other words, a space arranged with the goal of feeling warm and inducing wonder will not necessarily be experienced as such by the people in that space. This is not to say that the objective describing of a space and studying the effects of environmental cues is useless. A space might be ‘compelling’ in its possible interpretations, from subtle ‘affordances’ to explicit directions regarding the atmosphere it should have. The difference between ‘intended’ and ‘perceived’ might appear logical but it is not always a starting point in the formulation of theories.
11.4 **Heading outdoors.**

Most atmosphere research revolves around indoor spaces: shops and exhibition areas. In only a few cases does it concern the role of, for example, the shop window or the exterior as influences on how the atmosphere is perceived or one’s intention in visiting the space (Olahut, El-Murad & Plaias 2012; Mower, Kim & Childs 2012). Also, relatively little research has been done on the ‘atmospherics’ of the surrounding shopping environment, with most of these revolving around malls (Michon, Chebat & Turley 2005, among others). Research undertaken into city squares and parks do contribute something in terms of focus, in that these often approach their subjects in a similar way as with shops: establishing the influence of certain characteristics on one’s appreciation of a stay in that environment.

Hence with research into squares and parks, factors such as arrangement, presence of trees, shadow, surrounding sounds, facilities and maintenance (Raskovic & Decker 2015; Ezennia, Uwajeh & Irouke 2017; Liu, Xiong, Wang & Luo 2018) have been studied to see what effect these cues had on aesthetic appreciation, length of stay, return visits, satisfaction and so on.

The results of such studies do not do justice to the specific character of the exterior space. The reason for this can be clarified by Kotler’s (1973) description of the concept atmospherics: ‘the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability’ (p. 50). Independent of the specific aspect of purchasing, there’s a more general statement to be found here about the conscious manipulation of a space to achieve a certain effect (behaviour, cognition, affect) in people in that space. This effect is easy to imagine with shops (make a purchase), but with exterior spaces there is no such clear goal. Squares and parks have diverse functions, which play a role in such things as mobility, relaxation/rest, meeting place/social interaction, sense of wellbeing, recreation, sustainability (such as with water management in parks) and the (aesthetic) appearance of a city. People also have various reasons for visiting a park: relaxation, jogging, escaping home or work, going outside with the children, et cetera (Burgess, Harrison & Limb 1988). In this way, exterior spaces often offer a ‘variety of opportunities’ instead of a single goal that can be supported or enhanced with cues within that space.
The undifferentiated nature of exterior space, both in function and in use, is both a strength and a weakness. The strength is within the great diversity of users; the weakness is in the often-contradictory functions, whereby the space can appear to lack a sense of community and shared experience.

We can compensate for the weakness by employing the three previously mentioned distinguishing components of atmosphere. By responding to the different user motivations, we can explicitly address these motivations. The mentioned ‘variety of opportunities’ for a public space does not have to mean that these opportunities have to invisible or undifferentiated. In fact, in making these functions more explicit, visitors to the space can better relate to it and use the space in a way that fits with their motivation. This does not have to lead to a confusing space where different functions run through each other. A unity in the diversity can be achieved by making particular design choices. A good example of this is Copenhagen’s Superkilen park (Markopoulou, Farinea & Marengo 2018). The park is divided up into three different functions, which are each marked using different colours. A red square invites cultural exchange and sport activities by placing various game and sports facilities in the space. A black square functions as an urban living room with tables and benches, along with the possibility to BBQ and play chess. The green part of the park is meant for picnics, sunbathing, family outing and community activities. Unity has been created through the location, design and colour use.

People differ in their sensitivity to their surroundings. This opens up all sorts of opportunities to add more layers to an environment. These layers might consist of the previously mentioned cues; light, scent, sound and temperature can lend themselves well to (inconspicuous) manipulations that can be noticed by those that are sensitive to them, and therefore build a stronger connection to the space. The creating of certain scent sensations, for example by having plants in specific spots, or inducing temperature changes by ‘designing’ shadows (Tanizaki 2001) in unexpected spots, can also create a certain connectivity with the space. In addition, soundscapes (with the amplifying, or even filtering, of certain sounds) or introducing a sound that doesn’t fit with the context, can also give an extra dimension that not only pulls the attention of certain people, but also gives them a sense of intimacy by the small-scale, the joy or surprise brought about by noticing this intervention, or the possible triggering of personal memories.

Light is an often-used cue to add layering. A good example is the temporary light installation around the Dom church tower in Utrecht, where subtle lines of coloured light outline the original position of the Roman...
defence wall on the surrounding streets. While hard to miss, particularly at night, the meaning was not always evident and unfolded only through a public debate. Another example is the Shadowing project in Bristol that uses footage of the interaction between passers-by and their shadows in alleys, parks and squares (Markopoulou, Farinea & Marengo 2018) – adding a special layer of meaning and playfulness in an otherwise everyday location.

An important factor in experiencing atmosphere is the personal evaluation of the space. We describe a space with words such as cosy, crowded, uplifting, organised, inspiring or gloomy. Countless terms exist that can describe the impression a space makes. Kasmar (1970), alone, found five hundred different adjectives used by his study’s participants to describe just a few different spaces. But while the interpretation of a space can seem like a game of endless combinations, interpretation does not have to remain noncommittal: a space forces certain interpretations (affordances). These can often be brought under the aspects of order, spatiality, variety, complexity, coherence and size – all common qualities in architecture and planning. At the same time, the personal evaluation of situations can be brought back to a limited number of essential variables (Van Vliet 2018). Such ‘appraisal’ variables can include ‘agency’ and ‘controllability’. One can also play with such appraisal variables in the design of a public space. A good example is the interactive installation BruumRuum! in Barcelona (Markopoulou, Farinea & Marengo 2018). Through sensors listening to surrounding sounds of the city and passers-by (conversations, laughter, yelling), 900 LEDs embedded into the city square are steered to change colour and make figures and movements. The installation invites manipulation by passers-by (agency) of its forms and colours, whereby an interactive game arises between square, visitors and surrounding with the suggestion of control (controllability). Visitors who were asked about the installation said it created a better relationship with the space and increased their sense of safety.

There are yet more ‘appraisal’ variables that can be translated into starting points for design and implementation; together with the other components of atmosphere—motivation and ‘atmospheric sensitivity’—this analysis might be a leap forward in our thinking about atmosphere in public spaces.
Chapter 11: Building Blocks from Outside

The Atmosphere in Open Public Spaces

Superilla Poblejoc, IAAC Institute for advanced architecture
Catalonia (photo: Jens Rost)

Shadowing, Chomko & Rosier, 2014 (photo: farrowscreative)

BruumRuum!, David Torrents & artec3 Studio, 2014
(photo: Xavi Padrós)
### Concept

Which situational spatial and social problem does the design task focus on?

Which of the five mechanisms should the responsive installation use to activate the public space as a public realm?

- Sense of Place
- (Playful) Interaction
- Personalisering
- Routing & Leesbaarheid
- Control

### Diagnosis and Mechanism

<table>
<thead>
<tr>
<th>Spatial Composition</th>
<th>Affectivity</th>
<th>Materiality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which spatial solution is the responsive intervention intended to provide?</td>
<td>How will users or passers-by experience a responsive installation?</td>
<td>How is the spatial use of the installation embedded in the public space?</td>
</tr>
<tr>
<td>Intervention</td>
<td>Intensity</td>
<td>Social Coding</td>
</tr>
<tr>
<td>What spatial problem is the installation to solve so that the built environment can create the right conditions to facilitate a public domain experience? Which spatial design choices and compositions must be made for the intervention?</td>
<td>Is the intended experience peripheral or does it require active participation from passers-by?</td>
<td>What are the existing practices and habits at a particular location? Does the proposed installation fit in with this existing social coding?</td>
</tr>
<tr>
<td>Spatial Shape</td>
<td>Call to Action</td>
<td>Activation Space</td>
</tr>
<tr>
<td>Will the intervention refer to traditional spatial principles such as walls, active plinths, enclosedness, differentiation, etc.? Or will a new sort of shape, appearance and spatial composition be chosen?</td>
<td>How will the installation attract attention?</td>
<td>In what places will the public be made aware of the installation?</td>
</tr>
<tr>
<td>Relationship with the Surroundings</td>
<td>Social Learning</td>
<td>Landing Zone</td>
</tr>
<tr>
<td>How will the intervention relate to aspects of the surroundings that remain unchanged? And what message and ambience will the intervention have when it is not in use?</td>
<td>How can users quickly and easily understand what they are meant to do? By watching others, for example?</td>
<td>Is there room around the activation space where passers-by can easily stop to observe the installation from a distance?</td>
</tr>
<tr>
<td>Development</td>
<td>Exit</td>
<td>Comfort Space</td>
</tr>
<tr>
<td>How will the installation develop over time? Will the installation adapt to the rhythm of a location? Will the interaction follow the same pattern every day? Or will the content be changed regularly? Will this be done via an editorial plan or by a curator?</td>
<td>Can users also leave the interaction easily?</td>
<td>Will there be a space where spectators can gather who do not immediately participate in the installation but prefer to (initially) observe it?</td>
</tr>
<tr>
<td>(Potential) Interaction Space</td>
<td></td>
<td>(Potential) Interaction Space</td>
</tr>
<tr>
<td>Is there a logical relationship between the place where the installation is clearly visible and the place where passers-by can actually provide input?</td>
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</tbody>
</table>
What is the motivational basis for the responsive design: how is it motivated, what are its intended effects, what is the location like? How can the concept for the installation be described? What is the installation intended to achieve in its direct relationship with users? And how will the concept be shaped? What will the installation look like, how will it sound, and how will passers-by experience the installation?

Which relationships will develop between users and the installation and between users themselves?

How can passers-by provide input? Will this happen automatically because sensors ‘perceive’ them (ambient interaction)? Is active participation required (performative interaction)? And will this participation be individual, or can several people participate at the same time (allotted interaction)?

Where will the interaction take place? In the installation itself (arena)? Or is interaction to develop in the public space, having been prompted by the installation (conversation piece)?

What type of interface will be used? Will there be a remote-control device or panel to control the installation? Will passers-by be able to use their bodies to interact (shadowing)? Or will they interact using their own (mobile telephone) devices (soapbox)? Or will their presence or absence be recorded by invisible sensors (smooth operator)?

How will maintenance be organised in the course of time? Will certain hardware and software components need to be updated or replaced as time passes?

How will the experience of the installation develop over time?

What is the rhythm of the location for the proposed responsive installation? How does this rhythm change in the course of the day, and throughout the year? How will the installation connect with these patterns?

How long will the experience last for the user? Will this be pre-determined or will users themselves decide how long they want the experience to last?

How will the installation develop over time? Will the installation adapt to the rhythm of a location? Will the interaction follow the same pattern every day? Or will the content be changed regularly? Will this be done via an editorial plan or by a curator?

How will input from passers-by be represented? Will their individual contributions be visible? And if so, will individuals be identifiable or anonymous? Or will the input from passers-by be aggregated in a total or an average? Will outcomes directly translate into a concrete meaning? Or will input be represented by an abstract pattern?
PART

An Experiment

Responsive Public Space
Research for design: An Experiment.

In order to gain and provide insights into the process of co-creation and the production of a responsive design, a ‘research through design’ programme was set up and implemented as part of the Co-ReUs research project. Its goal was to understand the process of designing responsive public spaces by implementing it ourselves.

Designing a responsive space involves several parties: spatial designers, interaction designers, local stakeholders and the city council. This was precisely the mix of parties we worked with during the two-year research project: together, we moved through the three phases from analysis to implementation. The making process was central to the co-creation sessions.

Based on these sessions, two concepts were then selected for implementation. We developed these concepts in simple prototypes that we then placed and tested at ArenA Boulevard. In this part we report on the production and tests in order to distil and provide a concrete insight into the lessons for the design. This is preceded by a cartoon strip that shows the design choices underlying the interventions.