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THE SIGNIFICANCE OF CLIMATE FOR THE USE OF URBAN OUTDOOR SPACES: SOME RESULTS FROM CASE STUDIES IN TWO NORDIC CITIES.

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Abstract

The aim of the research presented in this paper has been to investigate habits and attitudes related to climate and outdoor activity, and to discuss the significance of climate in relation to a social and physical environment that becomes more and more urban. The context is the Nordic city and the Nordic climate and weather. Some results from a survey and field studies in urban public spaces in two cities are presented, i.e. results from mailed questionnaires on habits and attitudes related to climate and weather, on-site interviews on perceived climate and environment, observed activities and climate measurements. The everyday routines of urban life include very little time outdoors, but it varies much by season and weather. The demands for comfort in general rise, and they imply a climatically pleasant environment. The importance of small-scale building and green qualities increases by latitude.

Keywords:
public spaces; urban microclimate; outdoor activity; culture; climate; behaviour.

Introduction: Aim and Scope

Urban life is increasingly spent indoors, habituating people to the indoor comfort. Many formerly outdoor public functions, from all kinds of markets to sport arenas, are being built in and climatically and otherwise controlled. Air-conditioning these huge volumes is energy-consuming, and thus contributing to global warming. In a cold climate indoor spaces support social activity but discourage outdoor activity. Many people, however, believe that it is healthy to be outdoors, probably more so in a cold climate, where more effort is required to adjust the activity to the outdoor conditions. The outdoor environment then provides the climate and space for physically active activities. Moreover psychological research points at the restoring effects of "nature" and outdoor activities.

The aim of the research described in this paper is to investigate habits and attitudes related to climate and outdoor activity, and to discuss the significance of climate in relation to a social and physical environment that becomes more and more urban.

The climatic differences within the Nordic countries are rather big. Are these differences reflected in habits and attitudes to climate and outdoor staying, or are they neutralised by the influences of a global urban life? Season and weather are often obstacles to outdoor staying, especially in a cold climate. It is assumed that cold and otherwise "bad" weather is more negative for typically urban outdoor activities, due to a low level of physical activity.

Field studies have been carried out in urban spaces in the centres of two Swedish cities with different climate and of different size, Göteborg and Luleå. They include a survey in each of the cities and climate measurements, on-site interviews and observations. They are carried out within a multidisciplinary project, Urban Climate Spaces (www.hig.se/tb/by/forskning/urbanklimat.html). An additional aim with this paper is to combine results from the different methods used in this project.

Climate in this paper refers to climate and weather with roughly the same content as in the weather forecast - temperature, wind, clearness of the sky, rain. Weather denotes climate during a shorter time period, such as a certain situation, whereas climate is the characteristic weather over a longer time. Climate, however, is a general concept that can be used in all spatial and temporal scales. The urban microclimate denotes the climate near the ground, which varies within meters and minutes, such as between sunlight and shade, wind shelter and exposure. The climatic differences e.g. between the Swedish cities of Luleå and Göteborg refer to the differences on the macro level, such as the typical seasonal differences in temperature, wind and precipitation. It is called local or meso-climate.

Climate and Culture

The significance of climate for social development has been the target for imaginative speculation as well as systematic research for centuries. In "L'esprit des lois" Montesquieu (1757) put together and analysed an imposing amount of data on the climate and social system of different countries upon which he built his famous climate doctrine. The research on climate and culture expanded at the time of the big geographic explorations at the end of the 19th century. The geographer Huntington (1935), one of the front persons, draw maps of what he called climatic energy, that were based on a number of indicators on civilisation on the one hand and climate data on the other. This line of research was by and by stamped as racism, chauvinism and determinism. The massive critique seems to have put an end to the grand climatic theories, (Westerberg 1994, Storch & Stehr, 1997). Yet many of the statements of the climate doctrines have survived as beliefs and prejudices, such as the strengthening effect of a hard climate or the Nordic climate that makes people pensive and planning.

Many of the statements of the climate doctrines have survived as beliefs and prejudices, such as the strengthening effect of a hard climate or the Nordic climate that makes people pensive and planning. People from the Nordic countries are reputed to maintain a special relation to nature (Åke Daun 1989). Nature is a broad concept that includes the outdoor climate in contrast to the man-made indoor climate. Tage Wiklund (1995) argues that deep down there is a Nordic character, which is manifest in the comparatively sparsely populated and green

Nordic city, with suburbs that are not turned towards the centre but towards the surrounding nature. Wiklund penetrates a number of different possible explanations to the Nordic nature orientation, e.g. the Swedish legal right to enter private land, the Nordic mythology, and naturally the "nature". The forest, according to Wiklund, has played a special part as a space of freedom for the northerner. The southerner finds the freedom in the city. Wiklund's reference is the city of southern Europe. The Nordic climate is mentioned as a cause of difference, but it is not given much elaboration.

Today humans are independent of climate in the micro scale but influence it beyond control in the macro scale. The all overshadowing problem is climate change. This problem has to be approached also from a cultural perspective, according to Stehr and Storch (1995). Their argument is that the geographical and cultural differences in the way people conceive climate and weather must be taken into account in the communication between scientists and laymen. We believe that a geographical/ cultural perspective is important also in planning and urbanisation simply because planning is a global business and the climate is specific for the region or the place. Climate change at pedestrian level can be controlled to the extent it is caused by the form and spacing of the buildings.

Weather, Microclimate and Outdoor Activity

Around 1970 architects and planners began to worry about the decreasing number of grown-up people using the outdoor housing environment in the new suburbs. Several field studies were carried out to find out why. The decrease was a natural consequence of the rapidly improved housing standard. People preferred the private indoor comfort. Shortcomings in the physical outdoor environment, however, were also assumed to be an explanation. At least the physical shortcomings were something that could be amended in planning. Gösta Carlestam (1968) observed outdoor activities with an automatic camera and found that the weather was decisive for the number of people being registered. Pia Björklid (1974) observed children's outdoor activities. The results showed that the degree of physical activity decreased almost linearly with the air temperature. Modern city-planning was soon blamed for making the worst of our cold climate: large buildings with vast barren spaces in between created windy and thermally uncomfortable conditions in the outdoor areas.

Jan Gehl (1971) presented a simple theory on how the micoclimate influences social life in urban areas: People adapt their level of physical activity to the ambient thermal conditions. An attractive social environment needs other people, preferably sitting or moving slowly. When people are walking fast the result is too few people present at the same time to create an attractive social environment. A social environment, according to Gehl, must therefore have physical qualities that invite people to slow down, such as a favourable microclimate. If these qualities are absent people just do what they have to do, e.g. they take the shortest non-stop way from home to work. Jan Gehl introduced the concept of necessary and optional activities. There is no distinct line between what is necessary and what is optional, and the same activity, such as walking,

can be necessary or optional, and optional activities are not necessarily characterised by a low physical activity. Necessary activities, as seen from a societal point of view, which may be slightly different from the individual's point of view, always have priority in urban design. Gehl's emphasis on optional activities as being social and more vulnerable should be seen in this context – these activities simply need special attention.

Gehl concentrates on the social dimension of urban life for which contact with other people is the main goal. A physical environment with comfortable climate that does not require much adjustment is an important means to achieve this goal. Many Swedish researchers during the 1980:ies and 1990:ies (e.g. Berglund 1996) have concentrated on the other dimension of the urban outdoor staying that has to do with sports and walks, getting fresh air and contact with the natural element, which are physical activities that adapt to weather and season. In short they rather address the physical dimension of the outdoor environment. The importance of natural elements is also supported in extensive psychological research, pointing to nature's positive impact on health and well-being, (e.g. Kaplan 1983, Ulrich 2001, Grahn & Stigsdotter 2003). Also the current debate on obesity and immobility provides arguments for the idea of a physical environment that stimulates physical activity, such as a cold climate. One simply moves faster if it is cold without thinking of it. But it is a problem if the cold climate makes people remain indoors.

In our survey and on-site interviews the social dimensions and the physical dimensions of the urban outdoor activities are used as endpoints in a scale of urbanity that has been used to characterise attitudes and habits in relation to climate and outdoor staying. We have applied Gehl's concepts necessary and optional to categorise urban outdoor activity.

Human Biometeorology

Various comfort indices that model and predict the thermal interaction between the human body and its surrounding environment have been developed (e.g. Steadman 1979, Höppe 1999). Over the years their global ambitions have been criticised. Most indices are based on theories of the human heat balance and do not take social or cultural aspects into account. Nikolopoulou and Steemers (2003) show that only 50 % of the variance between objective and subjective comfort evaluations can be explained by the physical and physiological conditions. They suggest other factors that could influence the tolerance interval for thermal comfort, such as experience, expectations, sense of control, naturalness of the environment and need for stimulation.

John Zacharias et al (1999) have observed activities and measured the climate in a number of plazas in Montreal. Their studies strikingly demonstrate the combined effect of solar access and temperature for the use of the places. Interviews and climate measurements have been carried out similarly in public spaces in five European cities in a recently concluded project funded by the European Union. The result of the comparisons shows that the conditions for thermal comfort vary with climate and culture. People adapt to the climate they are used to (Nikolopoulou 2005). A comparison between urban spaces in Sweden and Japan

made as part of the Urban Climate Spaces project (Knez & Thorsson, 2005), arrives in the same conclusion.

The methods used in the above climate/ behaviour field studies are similar to the methods used in our case studies. This paper, however, focuses on weather and season rather than the microclimate and on use and perception in general rather than conditions for thermal comfort.

Methods

The field work has been carried out during more than two years and with different methods. An overview is given here. Each of the methods used is further described in connection with the presentation of results.

Mailed questionnaire survey

The project started with a survey in each of the two cities of Göteborg and Luleå in Sweden. Most importantly it included questions on a number of urban spaces among which a few would be selected for further case studies, as described below. The questions discussed in this paper concern habits and attitudes related to climate and outdoor staying. Apart from standard questions on age and sex, home and household, the survey also included questions on the place where the interview person grew up, i.e. about its climate and urbanity. There was plenty of space for spontaneous comments in the survey, and this opportunity was used by 20 % of the interview persons.

Questionnaires were mailed to a random sample of 600 people living in the city centres. 600 people working in the city centre, 200 of which had various degrees of outdoor work, were also included since we believed that out-door work compared to indoor work would give a person a different relation to the outdoors. The overall response rate was over 60 % in both cities.

The survey was followed up by some 15 telephone interviews in each city. Thus the attitude questions were clarified and the questions on outdoor leisure activities could be elaborated in more detail. The results of the telephone interviews are used in the same way as the survey comments, i.e. as explanations and illustrations in the discussion of the survey results.

Case studies in urban spaces – climate measurement, interviews and observations

Four outdoor spaces in the city centre of Göteborg and three indoor spaces in the city centre of Luleå were selected for case studies. Climate measurements, interviews and observations were made between 11 and 15 during five days in each of the four seasons. Interviews were also made in one indoor public space in each city. The five days were chosen within a 10 day period so as to be "normal" with respect to season and yet varying with respect to weather.

Wind, temperature, humidity and radiation were measured in one point at 2 m, chosen so as to be representative for where most people moved and also for the microclimate of the space. (Whether this point is representative can be discussed at length, but it does not much affect the results described here.) Human activities – sitting, standing, strolling, walking fast, and whether people were talking, eating, reading, etc. – were systematically observed every 20 minutes. 30 - 40 very short structured interviews, on-site interviews, were made with people in

each space each day. The interviewers were instructed to try to make a representative selection of interview persons with respect to age, sex and activity. During the cold periods and in the less frequented spaces practically everyone that passed was interviewed. When there were many people around, sitting, standing and passing, a representative selection was clearly more difficult to accomplish.

The two cities and the selected urban spaces

Göteborg is much larger than Luleå, and in that sense a much more urban city. Göteborg, the second largest Swedish city, has a population of half a million, which is almost 10 times bigger than Luleås' 70 000, which is a medium size of a Swedish city. Both cities are regional centres, with migrants from surrounding smaller places and countryside. The same kind of administrative, commercial and cultural amenities can be found and one can live the same kind of urban life in Göteborg as in Luleå, but the scale makes a big qualitative difference. Urban life in Göteborg has the anonymity of the big city and Luleå the "Gemeinschaft" of the small city. "Nature" in terms of natural settings is accordingly much more accessible for people living in the city centre of Luleå than for those in the city centre of Göteborg.

The climatic differences are large. Seasonal and diurnal variations generally increase with the proximity to the poles. In Luleå, 66□N, winter lasts for half a year compared to barely two months in Göteborg, 58□N, figure 2. Winter means that the diurnal average temperature is below freezing and that the days are very short, several hours shorter in Luleå compared to Göteborg. Göteborg is situated on the windy west coast, but the city centre has a more sheltered position on a river a few km upstream. Luleå in the least windy part of Sweden is situated on a narrow elevated peninsula surrounded by a large water table and thus exposed to winds in all directions.

The selection of spaces was made with respect to expected microclimate and function. We wanted the spaces to be climatically different, i.e. exposed to or sheltered from sunshine and windiness. Secondly we wanted them to be so frequently visited that there would be enough people to interview and observe. Thirdly we wanted the spaces to be well known and like places that could be found in any Nordic city. For comparison we would have liked spaces with similar functions and different climate. Such spaces, however, were not to be found.

The spaces selected in Göteborg first of all include the huge traditional ceremonial square, the Big square. Within a radius of 500 m are the sheltered historic Small square with a café (outdoors when the weather permits) and artisan shops, the lush Green park, and the wind–exposed River-side plaza by the river. These spaces we assumed to be different, and they were assessed as different in terms of microclimate and visual qualities in the survey. A large Indoor shopping area of covered streets was chosen as an indoor reference. Only the on-site interviews were conducted there.

We tried to find similar spaces in Luleå. The long quay of the former harbour facing south, the Sea-side walk, has many similarities with the River-side plaza in Göteborg. It is very exposed to the winds and it is situated in the periphery of the city centre. We chose the City park which is bigger and more open space than the Green park in Göteborg. Lunch activities are arranged there all year round which attracts many people. We chose a Pedestrian street crossing,

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which constitutes the very centre of the city. The Pedestrian street runs along the ridge of the peninsula and is notorious for its windiness. Shopping is an intimate indoor shopping centre in several storeys entered from the Pedestrian street crossing. It is the first Swedish shopping centre in Sweden, designed for the cold climate by the famous architect Ralph Erskine in the 1960ies. Its character is much different from the large indoor shopping centre in Göteborg. Data from all spaces are used in analyses on an aggregate level that are presented here. Six of the spaces are presented individually, figure1 and 3.

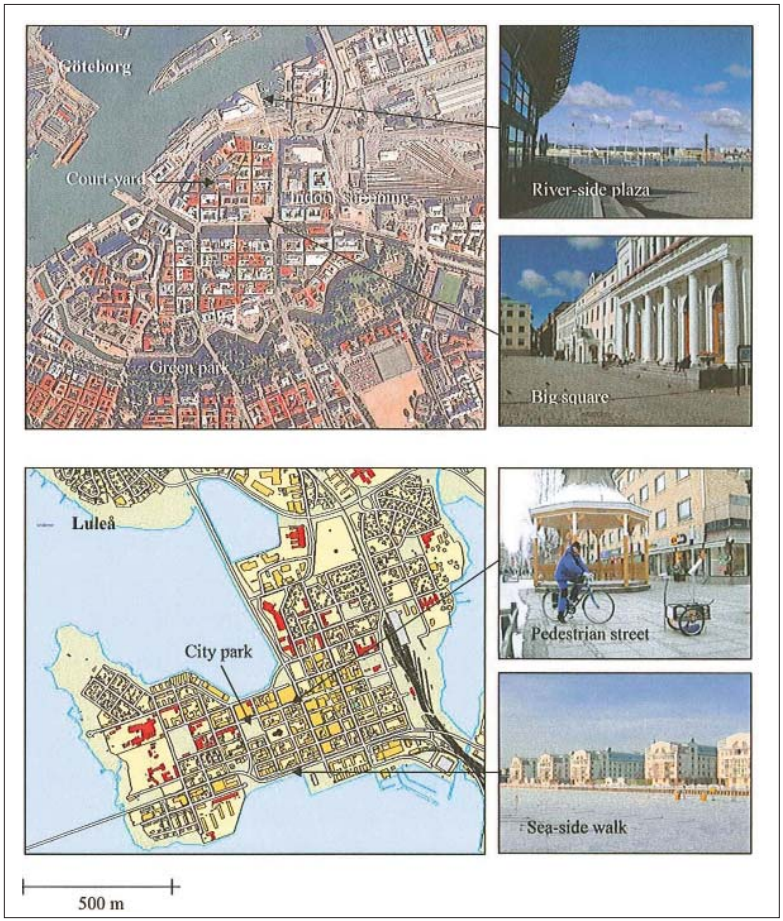

Figure 1: The City Centres of Göteborg and Luleå. Photos of the Urban Spaces Analysed in Figure 3. (Source: Author).

The weather during the case studies

The daily mean temperature during the case studies is presented in figure 3. It also shows a mean clearness index, which indicates the cloudiness or the clearness of the sky. The wind speed was rather moderate during the whole case study period ranging from 1 to 8 m in the gusts at the height of 2 m.

In Göteborg the winter weather was a little colder but the spring weather on the other hand much warmer than usual. The Luleå the weather on the whole was warmer. Rainy days had to be excluded for technical and other reasons, and in this way some more windy days were excluded.

Results

Attitudes to climate and outdoor staying

A number of attitude questions were asked in the survey, followed by a "summarising" attitude question on urbanity: "How much of a city-person or an open-air person are you?" The question was supplemented with the explanation that a city-person is attracted to the street-life, the shops, the entertainments of the city, whereas an open-air person is attracted to natural places, the sea, and the woods.

Almost half of the interview persons in Luleå as in Göteborg, however, stated that they were equally much of a city-person and an open-air-person, i.e. they marked 3 on the 5-graded scale. In Göteborg the city-persons outnumbered the open-air-persons. In Luleå the situation was reversed, i.e. the open-air-persons outnumbered the city-persons.

Over 80 interview persons in each city has commented on this question, and the background to their answers was also discussed in the telephone interviews. Open-air persons refer to leisure activities such as fishing and hunting in Luleå or the sea in general in Göteborg. City persons mention the cafés, theatres, shops, etc. Age is an important factor. Younger people rather refer to the life they would like to live, whereas older people refer to the life they actually live, for instance living in or outside the city centre.

Differences in city/open-air-orientation between groups of people are indicated in Figure 1. Attitudes to climate and outdoor staying are assumed to depend on earlier experiences as well as the present situation. The relative difference between the average values with reference to childhood environment, degree of outdoor work and sample is roughly the same in the two cities.

The working in the city centre samples include a majority of people living outside the city centres. The answers may vary due to situation and individual assessments scales and contribute to the big variance of the results. The results shown are significant. There are also interesting age and gender differences, which are not accounted for here.

From the results of a number of attitude questions preceding the urbanity question, (questions which are not presented in detail here,) we found that city-persons, in comparison to open-air-persons, to a greater extent think that outdoor staying needs fine weather. City-persons care less for autumn and winter, and they do not like darkness and snow. Open-air-persons, in comparison to city-persons, to a greater extent say that they follow the weather forecast, want to get out of the city when the

weather is fine and appreciate a daily contact with nature more. Most city-persons and open-air-persons agree that the weather is very important for health and well-being and that they like the summer best.

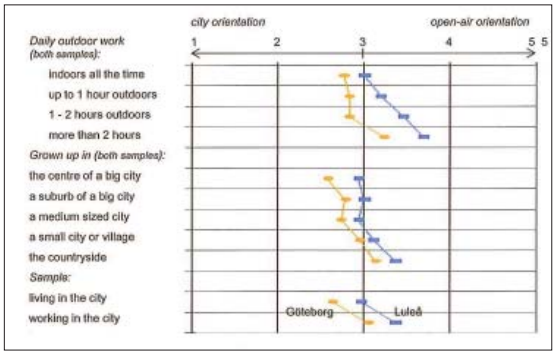

Figure 2. City versus open-air orientation for different groups of interviewees in the survey. The markers indicate the mean value on a 5-graded scale. The differences within the groups and between the cities are all significant, $p < 0,05$. There are big similarities in the patterns of attitudes of the same groups in the two cities. The citizens of Göteborg are systematically a little more of city-persons (Source: Author).

The telephone interviews underline that open-air persons in Luleå seem to have a special relation to the cold and harsh aspects of weather and season. Many of them seem to turn them into a positive challenge. A few claimed that they enjoyed going out in "bad " weather, and they maintained that it never got really dark during the winter because of the snow.

Another survey question concerned the time that was usually spent outdoors. From Statistics Sweden's diary investigation (2000/2001) one can roughly estimate an average time spent indoors. Compared to this it can be assumed that people in the survey have over-estimated the outdoor time, possibly because of wishful thinking. People working outdoors reported much longer time spent outdoors. It was strongly correlated to the time they worked outdoors. This is self-evident for workdays, but it was also true for work-free days. Over 80 % of those working outdoors more than two hours a day claimed that they used to spend more than two hours outdoors on a work-free day compared to 40 % of the indoor working interview persons. The difference between open-air persons and city-persons was much smaller. It was the same on work-days and shorter for city-persons than for open-air persons on work-free days.

City-persons reported more frequent visits to urban entertainment, such as cinemas, cafés, and restaurants. Open-air persons more frequently used the outdoor environment around their houses or they went somewhere else, i.e. often outside the city.

The influence of season and weather on outdoor activity

The questions in the on-site interviews mainly concerned subjective assessments of the weather and the place: "What do you think about the weather today?" and "How do you find this place right now?" Here the analysis is made with respect to the urbanity and activity of the interview persons. The urbanity question was the same as in the survey. The distribution of the answers very well reflected the survey differences between the cities, i.e. half of the answers were "I am equally much of both" and a majority out of the other half were city-persons in Göteborg and open-air persons in Luleå. The activity question was inspired by Gehl (1971): "What is the most important purpose for

your being here?" with the endpoints "I am on my way home, to work, some other place" and "I am here to enjoy the street-life, taking a walk, getting some fresh air ….". A majority of the interview persons answered in either of the end-point categories. The last category was somewhat larger in Luleå. The labels necessary and optional are used here in want of concepts that would suit the formulated endpoints better.

Significant correlation was found between both urbanity and activity and general weather assessments along the scale good - bad weather for outdoor staying and between both urbanity and activity and place assessments along the scale ugly – beautiful. City-persons and persons engaged in a necessary activity do not find the weather as quite as good as the open-air persons in engaged in optional activity. The differences were bigger along the activity than the urbanity dimension, but still rather small.

Urbanity and activity did not influence the perception of more specified aspects of climate and weather. The assessments of the weather and the microclimate of the place on the scales cold – warm and calm – windy did not differ with respect to urbanity nor activity.

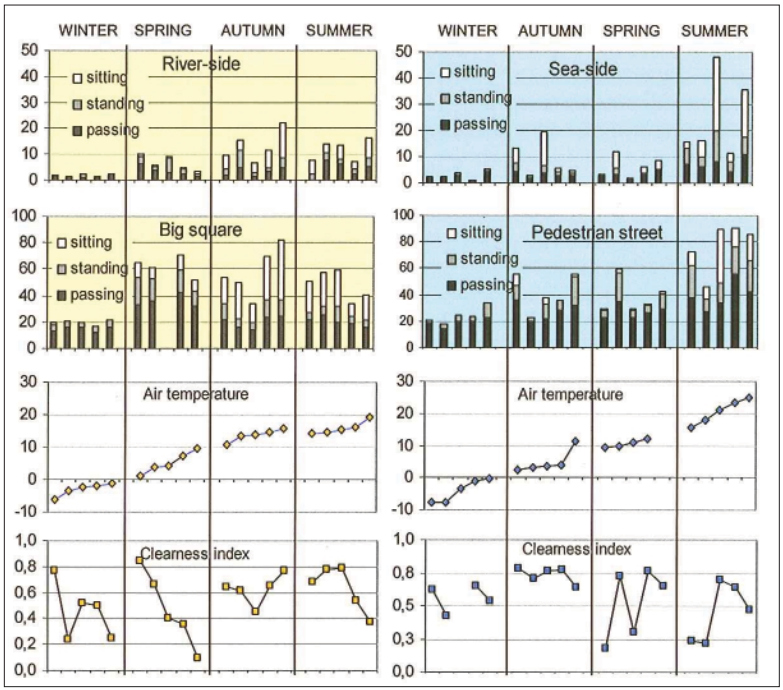

Figure 3. Observed activity and weather during twenty days in the River-side plaza and the Big square in Göteborg, the left column, and in the Sea-side walk and the Pedestrian street in Luleå, the right column. The diagrams show daily means between 11 and 15 hours. The days, grouped according to season, are ordered with respect to the temperature and not with respect to the date. The bars indicate observed number of people sitting, standing and passing. The clearness index measures the clearness of the sky, i.e. the net radiation in relation to the theoretical maximum radiation. (Source: Author).

More people are out to "get some fresh air" in Luleå than in Göteborg, in the peripheral spaces in both cities, i.e. the Sea-side walk and the River-side plaza, and more people in summer than in winter. The seasonal differences are small at the Sea-side walk and the River-side plaza. They are very clearly spaces for optional visits all year round.

Interestingly the situation is reversed for the large Indoor shopping area in Göteborg. In the summer compared to the winter a larger proportion of people actually go there, perhaps not to get fresh air, but for the pleasure of meeting other people. The indoor space is a warm alternative to the outdoor space.

Observed activities, exemplified in figure 3, confirm the differences between the cities, spaces and seasons concerning the necessary/ optional activities of the spaces, (sitting and standing signifying a more optional activity). There is a significant correlation between the observed number of people and the weather and season. Figure 3 also indicates a big variance, depending on all the other reasons to be in a place at a certain time. The two most extreme observations have been eliminated, i.e. when 180 people were passing in the River-side plaza and a day of a special event that attracted crowds of people in the Big square. Such events are as random as the weather and the smaller ones are included, thus contributing to the variance. The time of the day, however, has a regularly varying influence. In figure 3 the results are averaged for days, each bar including 11 observations. During four hours the weather (sunshine and windiness) may change considerably. The temperature varies slowly. The clearness of the sky may change from one minute to the other. Yet there is a correlation not only between observed activity and temperature but also between observed activity and clearness index. The wind normally varies very much, and no correlation was found between the wind speed and the observed number of people.

The average number of people increased almost 10 times from winter to summer in the Riverside plaza and the Sea-side walk. It increased three times in the Big square and the Pedestrian street. When the temperature is below zero almost everybody observed is passing the places. A person standing or sitting down for a quarter of an hour is 15 times more likely to be observed than a person who is just passing, assuming this takes a minute. What really increases the number of observed persons therefore are those sitting and standing. The seasonal differences in the number of persons visiting the spaces, not considering the time they stay, therefore is not as big as the bars indicate.

Concluding Summary

In the survey and on-site interviews attitudes and habits related to climate and outdoor activity have been measured on a scale with city-person and open-air person as endpoints. City-persons, by the definition given in the question, are attracted to the busy street-life and open-air persons are attracted a natural environment. The survey showed that open-air persons compared to city-persons spent more time outdoors, but in their housing environment and outside the city. They were more positive to autumn and winter, snow and darkness. Telephone interviews indicated that open-air persons especially in Luleå could turn the adverse events of the weather into a positive challenge, in fact illustrating Montesquieu's

climate doctrine.

Half of the interview persons in both cities consider themselves as equally much of city persons and open-air persons. Along this dimension the differences between different groups in the same city were larger than differences between the same groups in the different cities, e.g. the differences between people with indoor work and outdoor work in the same city were larger than the differences between people who lived in the different city centres. The process of urbanisation means that outdoor work disappears. It is moving indoors as do many leisure activities. People move from the countryside where their open-air attitudes and habits in many cases are reported to originate. A conclusion is that the open-air orientation is declining along with urbanisation.

The same city-person/open-air question was asked in the on-site interviews. There was no difference in the reported time spent outdoors or spent in the place before the interview. There was no difference in the perception of the weather in terms of warm and cold, calm and windy. Open-air persons, however, were slightly more positive to the current weather with respect to outdoor staying. An explanation is that the sensations of comfort are instantaneous whereas assessments in terms of good or bad weather demand some thought and references in terms of attitudes and habits.

Activity was investigated with respect to the main reason for being outdoors. People in optional activity, just out for a walk or to get some fresh air, were a little more positive to the weather. Optional activities were more frequent in the peripheral places than in the central. Weather and season made a great difference. The optional activities in the outdoor places decreased significantly from summer to winter. In the big Indoor shopping area in Göteborg the optional activities increased as the outdoor temperature decreased. The social life moved indoors when the chance was given.

Observations were made only in the outdoor spaces. The observed number of people increased considerably when the air temperature was above zero. In the peripheral places of both cities the observed number of people in the central places increased almost three times from winter to summer, and in the peripheral places it increased almost 10 times. The differences in the number of people passing the places was not as big since people would pass quickly in the winter and walk slowly or sit down in the summer, i.e. engaged in the typical urban activity of flaneuring and watching other people.

We have not been able to show that attitudes and habits related to climate and outdoor staying influence the use and perception of urban spaces in the city centres. The same weather conditions influence the use and perception in the same way in the same kind of places in both cities. In Luleå winter lasts for 6 months and in Göteborg it last for two months. This makes the big difference. The attitudes and habits may be important for outdoor staying, but obviously more for outdoor staying in a natural environment and outside the city centre. We have shown that a cold climate, like in Luleå, makes urban outdoor life more difficult. The slow rhythm of urban strolling does not go very well with a cold climate. Access to a natural environment, as in Luleå, is therefore

more important, and typical open-air attitudes are of good help in overcoming the long dark and cold winters.

Outdoor cafés grow up along the central paths in Luleå as well as in Göteborg. A favourable microclimate in terms of access to the sun and shelter from the wind is a prerequisite for this. Solar access and wind shelter depend on the scale and the building density of the city centres. According to Swedish criteria for assessing solar access in outdoor housing environments the distances between buildings need to be almost twice as large in the north compared to the south of Sweden to provide comparable solar access (Westerberg & Glaumann 1990). The same criteria would apply for any outdoor space for typically urban activities of a low level of physical activity. Buildings and vegetation reduce the wind, but high-rise buildings often create problems. The traditionally green and sparsely built-up Nordic cities are therefore well suited to the climate. The importance of these green and small-scale qualities increases by latitude.

There are plenty of reasons to support outdoor staying in the urban environment. Outdoor activities, especially in a cold climate, encourage healthy physical activity, and as pointed out by Gehl (1971) long ago, people are in themselves an attraction. Their presence is a prerequisite for a functioning public outdoor environment. But to maintain a public social urban environment it is also important to meet the requirements of the city oriented attitudes and habits which have proved to be susceptible to the unpleasantness of climate and weather. After all half of the interview persons in both cities think that the social and natural dimensions are equally important in urban life.

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