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Abstract

The main goal of this paper is to explore the concept of place and the emotions felt at specific places. The paper is concentrated on power places, places in which people recharge and feel at peace, and places that evoke positive feelings. The reported project is based on a set of mapping experiments conducted in the city of Hamburg, Germany. Participants were asked to map their power places, describe their characteristics and the feelings they feel at these places. In total, 191 power places were identified, including the descriptions of their physical characteristics and emotions associated with these places. This paper summarizes the main findings of the empirical work.

Keywords

power places, maps and emotions, uncertainty, urban planning, Hamburg

Disciplines

Cognition and Perception | Cultural Resource Management and Policy Analysis | Leisure Studies | Urban, Community and Regional Planning

Comments

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Mapping Expressed Emotions: Empirical Experiments on Power Places

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Abstract

The main goal of this paper is to explore the concept of place and the emotions felt at specific places. We concentrate on power places, places in which people recharge and feel at peace, and places that evoke positive feelings. Our research is based on a set of mapping experiments conducted in the city of Hamburg, Germany. We asked people to map their power places, describe their characteristics and the feelings they feel at these places. We collected 191 power places, the descriptions of their physical characteristics and emotions associated with these places. This paper summarizes the main findings of our empirical work. We conclude the article with a discussion of the main findings and further research directions.

1. Introduction

A theory on a sense of place proposes to distinguish between the *relationship to place* and *community attachment* (Cross 2001). The relationship to place consists of the ways that people relate to places, or the types of bonds with these places (Manzo 2003). Community attachment consists of the depth and types of attachments to one particular place. Cross (2001) argues that we can create a more meaningful understanding of people's attachments to places by thinking about *relationships to place* and *community attachments* as two separate but related aspects of a sense of place. In this article, we focus on the relationship to place, in particular on emotions felt at places.

The main goal of this paper is to contribute to the debates on the human perception of places, cognitive notions of these places, and expressed emotions felt at certain places. We also explore how these places and the associated emotions may be expressed by the people living in the selected area. Places as perceived and defined by observers do not have clear borders and mostly remembered by the atmosphere, perceptions and sensations felt by people. In such a way described places cannot easily be visualized and represented in a GIS. The description of a place cannot be reduced solely on its objects. Goodchild (2011, p. 1) claims that there is a "fundamental tension with the informal world of human discourse, and nowhere is this more apparent than over the vague concept of place." He calls for additional research on place-based GIS and explores this tension from various perspectives: current methods of geographic representation in digital form, inherent ambiguities, the case of the gazetteer, the role of volunteered geographic information, and place as an expression of context. Winter and Freksa (2012) support these claims and go even step further in stating how important it is to capture the "human cognitive notion of place" in order to attain a "smooth communication between human users and computer-based geographic assistance systems."

In our research we concentrate on power places. We define *power places* (*Kraftorte* in the German language), as *places in which people recharge and feel at peace or exuberance, places that evoke positive feelings, etc.* Where in a city are such places? We explore the locations of these places and their physical characteristics; how people/citizens express themselves when they

talk about particular places in the city in which they live; which words do they use to describe them and the feelings they feel at these places. These power places are self-selected by the participants, citizens and represent their personal power places.

Our research is empirical, based on a set of experiments with paper maps accompanied with a questionnaire. In our first experimental endeavor, the City of Hamburg, Germany was selected as our study case. Studying power places, their characteristics, and emotions felt at these places, can help urban planners, architects, landscape architects and urban designers to better understand public spaces in a city, and to create sustainable, livable and smart cities. It may also contribute to the discussions in GIScience related to place-based GIS (Goodchild 2011, Winter and Freksa 2012) and the questions relevant for digital cartography research on how to represent places and emotions in a GIS and on interactive online maps.

2. Literature review

2.1. Identity of place

According to Korpela (Korpela 1998, Korpela 2012), place identity is constituted as an ongoing process of emotion- and self-regulation. Physical environments can therefore be used to regulate pleasure/pain and self-experience, and place identity is partially formed by the experiences and cognitions produced in those regulation processes. Proshansky, Fabian et al. (1983) conceived of place identity as a substructure of self-identity. According to them, cognitions about the physical world in which the individual lives include memories, ideas, feelings, attitudes, values, preferences, meanings, and conceptions of behaviors, which relate to the complexity of the physical setting that define the daily existence of a human being. They stress the importance of the past of the person; the past consisting of places, spaces and their properties which have served instrumentally in the satisfaction of the person's biological, psychological, social and cultural needs (Proshansky et al. 1983, p. 59).

Place attachment is implicit in place identity; it accrues to places that fulfill people's emotional needs and enable them to develop and maintain their identities (Kaiser and Fuhrer 1996). Restorative experience is an inherent potential in emotion and self-regulation. Following negative antecedents such as stress and attentional fatigue, restorative experiences may involve positive mood change, renewal of directed attention capacity, contemplation on one's self in the scheme of things, and the like. Places that a person can rely on for restorative experiences are thus more likely to be places for which attachments develop over time and that in turn come to figure in place identity. In short, place identity, place attachment, and restorative experiences can be viewed as nested and reciprocally influential within self- and emotion-regulation connected to places.

2.2. Favorite places

Studies of favorite places (Korpela 1992, Korpela and Hartig 1996, Korpela 1998, Korpela, Hartig et al. 2001, Korpela 2012) provided empirical support for the integration of research on place attachment and restorative environments. This work is built on the assumption that the favorite place offers a window, and positive subjective moments, into the use of environments for self- and emotion-regulation. According to Korpela and Harting (Korpela 1992, Korpela and

Hartig 1996), favorite places appear to afford restorative experiences that aid emotional and self-regulation processes. In their initial studies adolescents described their experiences in their favorite places in a form of an essay. Their research suggests that adolescents use their favorite places to anchor emotions- and self-regulation. The adolescents would often go to their favorite places to relax, calm down and clear their minds after threatening or emotionally negative events. In addition, they reported about their experiences of beauty, control, freedom of expression and escape from social pressures. Favorite places were described as aesthetically engaging and afforded escape from social pressures and freedom of expression and control.

Korpela, Hartig et al. (2001) report further evidence bearing on the relations among restorative experiences, self-regulation, and place attachment. In their experiments, more than a hundred university students ($n = 101$) described their favorite places and experiences in them, and 98 other students described unpleasant places. Natural settings were overrepresented among favorite places and underrepresented among the unpleasant places. In their favorite places the subjects feel relaxed, being away from everyday life, tend to forget their worries, and reflect on personal matters. These indications provided a link between favorite places and restorative experiences. Often restoration was mentioned in relation to their experience in natural favorite places.

The favorite places identified in the previous studies have most frequently fallen into two broad and to an extent overlapping environmental categories: Parks, forests, lakes, and other natural settings have constituted the predominant category of favorite places. It is largely out of research on natural environments that restorative environments theory has emerged (Kaplan and Kaplan 1989, Ulrich et al. 1991). Although not focused on favorite places per se, a study by Francis and Cooper Marcus (1991) provided independent evidence of resort to natural settings for restorative experiences in the service of emotion and self-regulation. College students wrote essays about a time when they were feeling low or depressed and then went to a particular place to lift their spirits or gain relief. Of the experiences they had in the places visited, the dominant categories were “attaining a state of calm or balance” and thinking through or gaining perspective on problems. Natural features and a possibility for privacy were the most important environmental attributes (Cooper-Marcus 1997).

2.3. Experiences of places: place attachment

The experience of place is unique to each individual and is directly related to his or her lived experiences and personal disposition. The word “attachment” refers to affect while the word “place” refers to the “environmental settings to which people are emotionally and culturally attached” (Low and Altman, 1992, p. 5). Understanding the concept of place provides an important framework for understanding the way people form relationships with places and incorporates several interrelated and inseparable aspects of people-place bonding (Altman and Low 1992). When relationships develop between people and places, the result is often a feeling of place attachment. According to (Low 1992): “Place attachment is the symbolic relationship formed by people giving culturally shared emotional/affective meanings to a particular space or piece of land that provides the basis for the individual’s and group’s understanding of and relation to the environment”. Proshansky, Fabian et al. (1983) described place attachment as involving the interplay of emotions, knowledge, beliefs, and behaviors in reference to a place. Place attachment refers to the idea that people develop special bonds with certain settings that hold deep meaning to the individuals (Low and Altman 1992). It is a set of feelings that emotionally binds people to a particular place (Waxman 2006). “Places root us—to the earth, to

our own history and memories, to our families and larger community” (Cooper-Marcus and Francis 1998, p. xi).

Traditional definitions of place attachment view it as an outcome, as feeling of being attached (Tuan 1974). Harris, Brown et al. (1996) emphasize place attachment as both the feeling of being attached and the process of becoming attached, which includes reasons for the attachment.

Attachment to place involves the assessment of the current setting, as well as the assessment of the relative quality of alternative settings (Stokols and Shumaker 1981). Higher quality environmental settings are those that support the goals and activities of the person (Stokols and Shumaker 1982). Relph (1976) believes that to be inside a place is to belong and identify with it. Tuan (1980) suggested the existence of a state of rootedness in which one’s personality merges with one’s place. He wrote that the primary function of place is to engender a sense of belonging and attachment. Place attachment can be looked at in a transactional perspective where place attachment is not composed of separate or independent parts, components, dimensions, or factors. People and place interact together to form the experience. By better understanding those components that contribute to positive place experiences, designers can create spaces that promote comfort, a sense of belonging, and a bond between people and place (Waxman 2006).

2.4. Our research focus: mapping emotions and places

Places as described and perceived by humans tend to be vague in particular in respect to the uncertainty of their borders, locations, and perceptions. Thus, rather vague descriptions of places cannot easily be visualized in a computer-based system such as a geographic information system (GIS). A GIS models the world around us in a set of objects with clearly defined borders of these objects. Places as described by people often do not have clearly defined borders and may be described with words for feelings, atmosphere, air and/or water. Goodchild (2011) calls for additional research on place-based GIS. Winter and Freksa (2012) support his call and claim the importance of studying “human cognitive notion of place” which can “smooth communication between human users and computer-based geographic assistance systems.”

Recently, mapping places and emotions gained more attention in the geoinformation science community. Christian Nold (Nold, accessed 2017) in his ‘Bio Mapping Project’ (biomapping.net) used galvanic skin responses in the investigation of degrees of stress and excitement. In his follow up project, the Emotion Mapping Project (emotionmap.net), he and his collaborators conducted experiments in Paris, Stockholm, San Francisco, and Greenwich, resulting in the city Emotion Maps. Cope and Elwood (2009) explored qualitative data and their representation in a GIS. Krygier and Wood (2011) focused on mapping intangible data by using geographic information systems (GIS). Edler (2011) studied cartographic visualization of intimate perceptions of space in Bolderāja, in Latvia. Jang (2012) studied visualization of emotions and a creation of a 3D emotional map to reveal the unique emotions inherent to the areas surrounding the Yeongsan River in Korea. Griffin and Mcquoid (2012) reviewed research and project efforts in the representation of emotion in maps as well as the use of maps to collect emotional data. They also discuss the role of maps in evoking emotion in map readers. Gartner (2010) concentrated on emotions and wayfinding. Zeile and his collaborators (Zeile et al. 2015a, Zeile et al. 2015b) explored emotional aspects of urban planning. Their long-term goal is to “develop a new information layer for planners, in which a visualization of the measured spatial perception is possible.” They claim that “These visualizations allow conclusions about human

behavior in an urban environment and enable a new citizen-centered perspective in planning processes.”

All this research demonstrates efforts done in the field of qualitative and intangible data, the issues of capturing these data and their visualization on maps. Emotions are an example of such qualitative and intangible data. We not only focus on emotions and mapping emotions, but rather connect them with places and descriptions of places. We aim to contribute to the discussions on experimental cartography, understanding and mapping emotions and place-based GIS.

3. Research methodology: empirical mapping

3.1. Research questions

We are interested in the way people describe places in a city and how they feel at these places. Based on the literature review and our own perception we narrowed down our research focus to a particular type of places; power places. Power places are, for the purpose of our research, defined as open outdoor spaces/places in which people can recharge, feel positive feelings, restore, or visit with the intention to feel positive feelings and/or recharge.

In our experimental work we concentrated on the city of Hamburg, located in the north of Germany. Hamburg was selected because of its size; in this research we targeted big cities which tend to be the least understood from the perspective of place perception and emotions felt in big cities. Hamburg is the second largest city in Germany with a population of over 1.7 million inhabitants. It is also an important transportation and trade hub with its second largest harbor in Europe. Our research is led by the following research questions: Where in Hamburg are power places located and what are their physical characteristics? How do the citizens of Hamburg describe these places? What kind of feelings do they experience and how do they describe these feelings? Which words do they use to describe them? How can these places be mapped in a GIS? In order to be able to answer these questions we designed a set of mapping experiments.

3.2. Participants

The participants were arbitrarily selected citizens of Hamburg and those who know Hamburg very well; most of them were students in Hamburg. We excluded visitors, tourists or people that were on a short term stay in Hamburg. Our research did not target a particular age; we were interested in places and corresponding emotions felt across the age groups. We involved 101 citizens and received corresponding 101 filled-in questionnaires with the descriptions for 191 power places. They included 57 women, 41 men, and three participants not stating their gender. In the age category we distinguished among participants younger than 20, 20-34 years old, 35-49, 50-65 and older than 65. The majority of the participants, 83, were students at the university in the age between 20 and 24. We also had 10 participants younger than 20 years old, one participant of the age between 35-49 and one of the age between 50-65. 6 participants did not want to reveal their age. How long they lived in Hamburg we distinguished the following categories: less than two years, 2-5 years, over 5 years, and since their childhood. 26 participants lived in Hamburg for less than 2 years, 20 between 2-5 years, 15 over 5 years, and 32 since their childhood. 4 participants did not respond to this question and 4 of them lived outside of the city of Hamburg, but claimed to know Hamburg very well and lived in Hamburg in the past.

3.3. Material

The material we used for the mapping experiment was a big paper map of the city of Hamburg (Figure 1). This map was combined with a city map which enabled a quick search of the street names listed as an appendix to the map. This additional map was placed next to the paper map representing the city and its surrounding areas. Additionally to these two maps we used a plastic transparent writing cover which we placed over the big paper map of the city. The plastic cover enabled the participants to use special writing pens and draw their power places on the map. The material also included a questionnaire printed on a paper and a list of emotions also printed on a paper.



Figure 1. Paper map of Hamburg with printed questionnaires on the right hand side

3.4. Procedure: Mapping experiment

We executed a set of experiments at three different locations. The first set of experiments was executed in a building of the HafenCity University Hamburg (HCU) in the city district City North. The second set of experiments was executed on a nice sunny day in front of a university building in the university campus close to the Dammtor area. The third set of experiments was executed in the HCU building Averhoffstrasse. All experiments followed exactly the same procedure. First the participants were asked for the consent of being involved and to participate in the experiment. Then, the experimenters explained the idea of a power place to them; the explanation was done verbally by one of the experimenters. All experimenters were using a pre-prepared text describing what a power place is. Every participant heard exactly the same text about the concept of a power place. The concept was also written in the top section on the questionnaire; see the Appendix 1 for the original formulation of the sentences explaining the concept of power places. A translation of this text from the German language is as follows:

A power place is a place of choice at which people recharge and relax. At this place they can find their balance and inner power in an often very stressful daily life. A power place can evoke different emotions. Power places are located outside, in open public spaces.

The participants were asked to think about their own personal power places. They chose a writing pen and they marked up to three locations of their power places on the plastic writing cover with the big map of the city underneath. A maximum of three power places were suggested/allowed per person. These marked places were given the same number which was also

written down on the top of the questionnaire. In this way, the answers on the questionnaire could be directly linked to the places marked on the map.



Figure 2. Mapping experiments in the district City North in Hamburg

Figure 2 shows two experimenters giving instructions (standing) and two participants responding to the questions in the questionnaire. After marking their places on the map the participants answered the questions in the questionnaire. The questionnaire was accompanied with a list of emotions. Some people have problems finding words for feelings, so we provided a list of words describing emotions which we found in the book written by Rosenberg (1999). This list served as an orientation about possible words that can be used to describe feelings they felt at their selected power places.

3.5. Questionnaire

The described mapping experiments were accompanied with a questionnaire. The questionnaire starts with the definition of power places and a short explanation of the information required from the participants. The information requested is structured as follows:

- a. **Location.** We asked the participants to provide information about the location of their power places. We asked for as accurate information about the location as possible. The map of Hamburg with the addresses was always available for everybody who wanted to check the precision of the location input.
- b. **Characteristics.** The power place has certain physical characteristics that its visitors may notice and appreciate. Each power place had four lines available on which the participants/citizens could write words. They were instructed to describe the main and the most important characteristics of their power places.
- c. **Emotions.** Which emotions do they feel at the selected power places? A list of emotions was provided to help to find words that describe emotions, in case the participants had

problems finding proper words that would best describe what they feel. There was a place on the questionnaire for up to four words describing power places.

- d. **Accessibility.** How do participants/citizens access their power place? With which means of transportation? The options for the transportation means available to them in the questionnaire were: walking, with a bike, with public transportation, with a car, water transportation means such as boats, kayak or canoe.
- e. **Sketch.** There was a place for a sketch for each of the three selected power places. The sketches provided were based on the participants' mental maps of their power places.
- f. **Basic information about participants.** At the end of the questionnaire we ask the participants about their gender, age, how long they lived in Hamburg, and in which district and street do they live.

3.6. Mapping power places in a geographic information system (GIS)

We collected 191 power places described and mapped by 106 participants in all three surveys combined. The power places marked on the big paper map of the city of Hamburg were inserted into a geographic information system (GIS). We used ESRI ArcGIS software to accomplish this task. The power places were inserted as a point feature and saved on one layer. We also designed an attribute table containing the descriptions of power places and the emotions felt at these places. These words, maximum four for the characteristics of the place and maximum four for the emotions of the power place, were saved as attributes of the points indicating the locations of power places.

4. Empirical results: Mapping power places and emotions

4.1. Power places and their locations

Figure 3 shows a map of 191 power places indicated on the map as red points. Their locations were inserted from the questionnaires into a GIS. The map is in the scale 1:150.000, the blue areas represent water bodies, and green areas represent parks and open public spaces that have some vegetation. The data source for the base map is ATKIS GDB 2010, LGV Hamburg. We can see a clear spatial concentration of power places along the water bodies, especially along the Elbe River. There is a higher concentration in the city park Stadtpark, which is a big open space north of the downtown area. A high concentration of power places can be also observed along the Alster, the artificial lake close to downtown Hamburg.

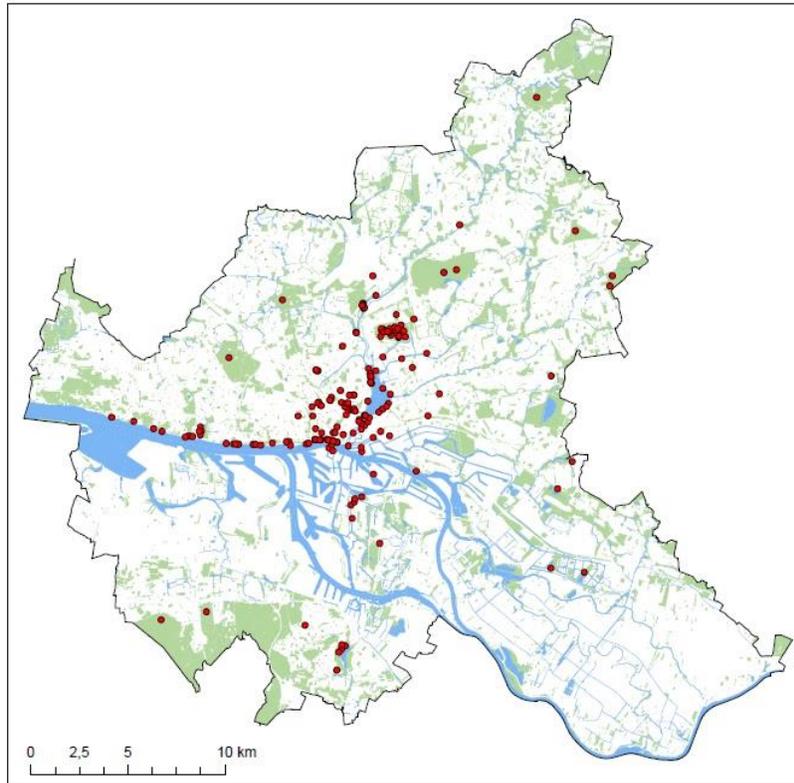


Figure 3. 191 power places captured in the survey executed in the city of Hamburg, Germany

4.2. Power places and their characteristics

We collected up to four descriptions of the main characteristics for each power place. The participants were free to choose whatever words they wanted to describe their selected power places. We gathered at least one description for 182 power places; 9 power places did not include any description of characteristics. After reviewing all characteristics we decided to categorize them based on their meanings. Analyzing the material we ended up with seven main categories. These categories include: atmosphere, experience, water, green, objects, infrastructure, and activities.

The category *atmosphere* includes expressions/descriptions that were not an object or an infrastructure, but rather related to the feeling, perception and emotion of the place. How does this place feel? Most of the people described how this power place feels to them in the category of “describe the place”. The second category includes *experience*, descriptions describing what kind of experience people might have at their power place. The third category is related to the *water bodies*, and the fifth one to the *green areas* and nature. The category of *objects* includes all objects mentioned except those related to water and green areas. *Infrastructure* concentrates on infrastructure available to the participants. The questionnaire did not ask about the activities performed at the power places, but some participants decided to describe their power places in relation to the *activities* that can be executed/performed at their power places. Sometimes a word could be placed into two or several categories; we included them into all corresponding

categories. In the following, we summarize the words included in each category describing this category with the words used by the participants of the mapping experiments.

In summary, counting all descriptions we can conclude that the main characteristics of power places as collected in Hamburg are:

- **Atmosphere.** Altogether atmosphere or its characteristics were mentioned 162 times. The words describing atmosphere included: soothing, liberated, shades and sun, light, peaceful, warm, animated/busy, lively, calm, silent, isolation, beauty, calming, laud, colorful, full, harbor flair, peace, cold, soothing, dark, relaxed, exciting, fascinating, pulsating, fresh air, sunset, windy, laud, powerful, bunt, humid, diversified, interesting, nice atmosphere, special aura, young, not busy, romantic, good feeling, diverse, idyllic, multi-cultural, lots of traffic, natural, wild, interesting, good smells, no car noise, historical, skyline, beautiful view, blessed, agile, bright, lively, active, interesting, urban, city like, people in a good mood, relaxed people, freedom, secure, singing birds, protected, no people, energetic, city vividness, interesting people, beautiful atmosphere, touching.
- **Experience.** Experience was mentioned 128 times including the words describing the experience including: nice view, beautiful view, little noise, shades and sun, beach feeling, relaxation, lots of people, kind people with nice dogs, view over the harbor, isolation, people, clean and neat, fresh air, sunsets, lots of artists, view on the river Elbe, ships, visitors, maritime, being in the middle where things are happening, wind, beautiful houses, great feelings, nice coffee houses, freedom, urban, interesting people, multi-cultural experience, place to walk, open air cinema, ducks, organic market.
- **Water.** Altogether, descriptions of water or proximity to water were mentioned 103 times in a variety of ways: proximity to water, close to water, a lot of water, on the water, close to the river, river Elbe, harbor, sand, river, water and ducks, beach, pond.
- **Green.** Descriptions of green, green areas were mentioned 82 times in a variety of ways: lots of green areas, big green areas, meadows, forest, lots of plants, green oasis in the middle of a big city, nature, park, trees, wood, grass, naturally preserved area, wonderful flowers.
- **Objects.** Objects excluding water and green were mentioned 53 times using the following words to describe them: eliminated houses, beautiful houses, palm trees, flowers, trees, boats, paddleboat, city furniture, wood, office building, many old people, trees, animals, dogs, visitors, cars, dry-dock, boats, oarsman, birds, skyline, benches, cable stones, plants, coffee place, relaxed people, chapels, old city hall, families, university, stones, stairs, ducks, brick factory building.
- **Infrastructure.** Altogether, infrastructure and the words used to describe infrastructure were used 42 times with the following descriptions: walking paths, public transportation,

swimming pools, light, possibilities to sit, benches, barbeque places, promenade, close to the center of the city, city furniture, many benches, small walking paths, coffee places, beer places, beach, enough space, sport possibilities, playground, place for children, close to the river, close to the harbor, open air cinema, bio-market.

- **Activities.** Even though we did not ask specifically about the activities, they were mentioned 19 times with words describing activities such as barbequing, sitting, sport, promenade, sledding, playing with the kids, movement, stroll/ramble, swimming, open air cinema, strolling, walking.

The survey had four places available for the selection of the words. We call them levels; the first level means the word that was placed on the first top space available for the descriptions. Some people added more words, up to five, therefore we have five levels. The levels of the descriptions might have a meaning indicating that the words mentioned on the first level seemed to be the participant's first association with the place and they seem the most important. Table 1 summarizes the frequencies a group of a certain characteristic was mentioned on a particular level. It is interesting to see that people first mention the physical characteristics such as water (64 times) and green (47 times). They are followed by atmosphere and experience. Already on the second level, the experience (mentioned 45 times) and the atmosphere (mentioned 38 times) become more important than the physical characteristics such as water and green.

Characteristic	First level	Second level	Third level	Fourth level	Fifth level	Together
Atmosphere	29	38	55	38	2	162
Experience	27	45	39	13	3	128
Water	64	22	17	4	2	109
Green	47	8	16	8	3	82
Objects	8	13	15	15	2	53
Infrastructure	4	5	16	14	3	42
Activities	5	3	4	7	0	19

Table 1. The frequency of descriptions belonging to the specific category

4.3. Power places and emotions felt at these places

Table 2 provides the overview of the most often mentioned emotions felt at the power places. Emotions mentioned less than seven times are not included in the table. We kept the original German words for feelings in order to keep the authenticity of the description for those who understand German. The words are then translated into English for the readers of this article. The most often used words describing emotions felt at the selected, favorite power places included relaxed/entspannt (mentioned 50 times), exuberant/lebendig (29 times), calm/ruhig (28), happy/gluecklich (24), animated/belebt (24), satisfied/zufrieden (24), liberated/befreit (18), peaceful/friedlich (18), balanced/ausgeglichen (17), pleasant/angenehm (17), and carefree/sorglos (16).

Feeling	First level	Second level	Third level	Fourth level	Fifth level	Sixth level	Together
relaxed/entspannt	27	18	9	5	-	1	50
exuberant/lebendig	8	10	6	4	1	-	29
calm/ruhig	8	8	4	8	-	-	28
happy/gluecklich	6	10	6	2	-	-	24
animated/belebt	9	8	5	2	-	-	24
satisfied/zufrieden	5	8	8	3	-	-	24
liberated/befreit	6	3	2	6	1	-	18
peaceful/friedlich	8	4	4	1	1	-	18
balanced/ausgeglichen	9	2	3	2	1	-	17
pleasant/angenehm	8	2	1	6	-	-	17
carefree/sorglos	4	4	3	5	-	-	16
energetic/energiegeladen	5	3	4	-	1	-	13
inspired/inspiriert	4	4	2	2	-	-	12
touched/beruigt	6	1	3	1	-	1	12
serene/gelassen	5	4	2	-	-	-	11
easygoing/unbeschwert	1	3	4	3	-	-	11
mindless/unbekümmert	2	2	5	2	-	-	11
friendly/freundlich	-	2	2	-	-	-	4

Table 2. Overview of the emotions felt at power places

We give just an example of mapping power places where the participants feel relaxed. Figure 4 illustrates their locations on a map of the city of Hamburg. The majority of these power places can be found along the water bodies; along the river Elbe and Alster Lake. A high concentration can be also seen in a big green area, the city park of Hamburg (Stadtpark) located in the north-west of the city center/downtown.

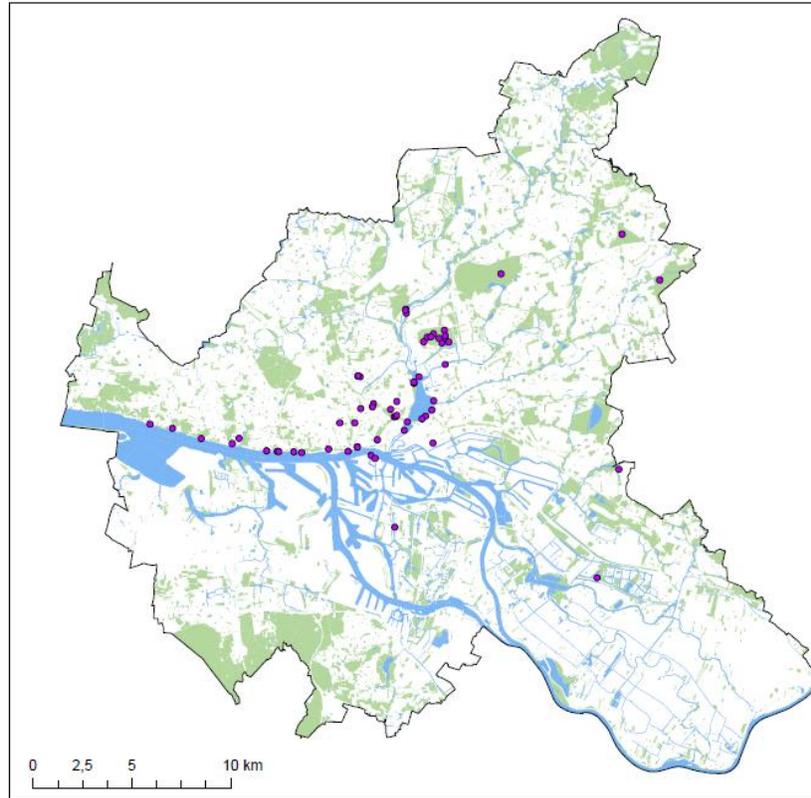


Figure 4. Location of power places at which the participants feel relaxed

5. Uncertainties in mapping (power) places and emotions

5.1. Uncertainty of the location

The location of the power place is often uncertain and not expressed in exact terms. Figure 5 gives an example of a power place that is associated with a bench located in a park with a view to the river. The round big dots represent possible locations (sitting or standing) for the person indicating this bench to be her power place. We can see nine round dots indicating possible locations for this person at this particular power place; more than nine exist in nature. We assume that her experience may not be much different at any of the nine locations. If the person wants to sit on the bench; this would make a difference. Several locations of her sitting on the bench are possible. However, a young person might also want to sit in front of the bench in the grass and enjoy the river view. This example illustrates how vague the concept of the place's location is in general, and in particular the power place. Indicating and mapping a power place as a point is a highly generalized representation if this place.

Mapping a place in a GIS requires a clear decision about the location of this place, which might not be possible for a power place. Even though it might be a rather large area, the GIS expert needs to decide about locating it at that one particular location. In case a road was

given as an indicator of the vicinity of the power place, the GIS expert needs to locate the power place somewhere along the road. There is a certain level of imprecision included in mapping power places in a GIS. The imprecision is also related to the often imprecise input of the information on the transparency; or for the participants not being able to exactly locate the power place on the static paper map. Ideally the subject would physically be in the power place and indicate it with a GPS device to be able to notify the exact location in an online mobile volunteered geographic information (VGI) system or in an online Public Participatory GIS (Poplin 2012).

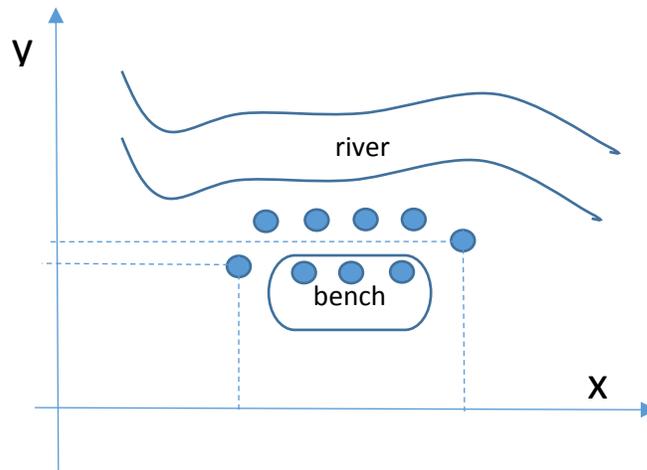


Figure 5. An example of a power place at a bench with a river view

5.2. Uncertainty of the shape of a place

We mapped power places as points and often they can be marked as points. Based on our experiments we can conclude that the shape of a power place depends on several factors. The most important factor is the activity performed by the users of this space. The power place can be perceived as a place at which one can be more static and enjoy it at one place/one location/one “point”. This is true in cases when the location can be identified with a high precision as a point, as a relatively exact location. Often, as in the case of a bench (Figure 5), the location might have a broader meaning representing a more general area (of the atmosphere, experience and location) and might have to be represented as a polygon. If one were to indicate a playground or a soccer field, then these areas would of course be larger.

In our empirical work, several of the participants indicated that they feel like “the whole line” as their power place. Examples of such places in Hamburg included the running path along the Alster Lake, where many runners enjoy jogging, fresh air, freedom, great views on the lake, the beauty of the Alster Park, and the nearby restaurants and coffee places. This whole area is a meeting place where people want to be seen and want to meet other people. Figure 6 marks three main areas indicated as a power place in the shape of a line. This experience encourages us to think about different shapes of power places and also their differences in

sizes. Our first mapping experiment did not deal with these characteristics of power places, but rather inspired our future research in this direction.

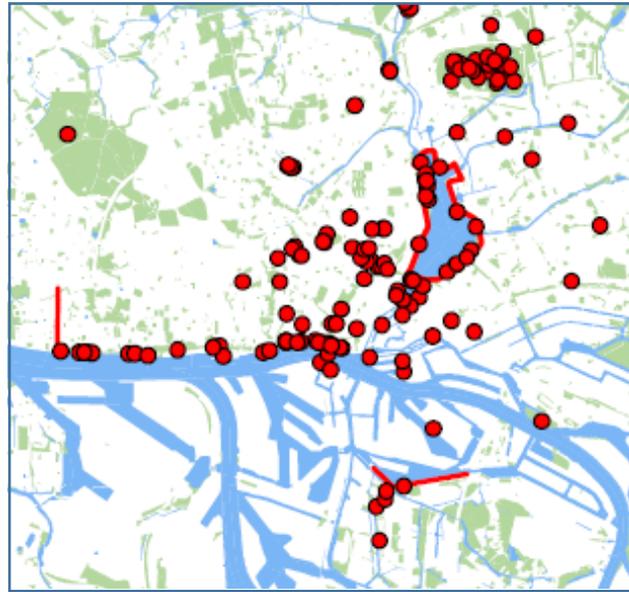


Figure 6. Power places as lines

5.3. Uncertainties of the expressed emotions

The uncertainty of the emotions can be derived from the differences in the meaning individuals attach to certain words and descriptions. The descriptions and words can be good approximations of what we have learned that they express. We cannot possibly explore the possible differences in the way people describe and perceive different emotions or whether they have the same sensations when they choose the same word. In our study we assumed that the words “relaxed” or “happy” means about the same to all people who selected this word. Additional research in the meaning of these words may indicate the differences in human perception of these emotions and the selection of different words for the same or very similar sensations. In our empirical work we observed that a number of people had a rather limited vocabulary to express their emotions; in most cases they did not know many words for emotions. Thus the list of emotions we provided (developed by Rosenberg) was a great help and a helpful tool. Additional research is needed in this area, and especially in the area of urban emotions in which we may link the physical characteristics of places and the emotions to these places and their characteristics they may evoke.

6. Conclusions and further research

The main goal of this paper is to discuss the concept of a place and specifically the example of a power place, how people describe these places and which emotions may be evoked at these power places. Power places were defined especially for our empirical mapping experiment as places which evoke either positive or relaxed feelings. We focused on the city of Hamburg,

Germany, and executed three sets of mapping experiments at three different locations in the city. In particular we were interested in the locations of these power places and the emotions people feel at these places.

This paper summarizes the main findings based on the collected 191 power places. The most important characteristic of these places, as described by the participants, is their *atmosphere*. Atmosphere is described with words as soothing, peaceful, warm, with shading and sun, lively, interesting, energetic, singing birds, beautiful view, pulsating, idyllic, etc. What causes the atmosphere to be observed and felt in a particular way? Which elements are important? I can claim with certainty that we are not able to understand the atmosphere very well, and additional research is needed in order to clarify the impact of “atmosphere” on overall happiness and the well-being of people. The second most important characteristic was *experience*. Experience was described as multi-cultural experience, nice coffee houses, interesting people, lots of artists, ships, visitors, maritime, being in the middle where things happen. The categories of atmosphere and experience are distinguished by the fact that atmosphere is something that is there, at the place. Experience is an activity or experience one can have at this place. The presence of water was an important aspect of a power place and it was mentioned 103 times; the proximity to water is very important. Green areas were mentioned 82 times and include lots of green areas, trees, parks, woods, flowers, naturally preserved areas and lots of plants. The objects, infrastructure and activities that can be performed at these places were not the most important elements of the power places. We are not sure why; it can be that people of Hamburg assume this infrastructure will be available to them and do not appreciate it so much or its meaning and their importance for identifying power places is much lower than the atmosphere, experience, water and green. These aspects need to be further explored in the continuation of our research.

The most often felt emotions were relaxed (mentioned 50 times), exuberant (29), calm (28), happy (24), animated (24), and satisfied (24). Other emotions mentioned often included liberated, peaceful, balanced, pleasant, carefree, energetic, inspired, touched, serene, easygoing, still, and friendly.

In the next step of our research we plan on identifying places at which the majority of these feelings were mentioned. We will investigate them according to the parameters of atmosphere, experience, water, green, objects, atmosphere and activities. In this way we will be better able to understand power places, their characteristics and the associated emotions. Our further research will also include testing the methodology in other cities and a comparison of the results. Based on this paper, one of a kind, it is impossible to discuss whether these results are transferable to other cities or not. Such a discussion would be a pure speculation; we call for additional research in this topic. Additionally important is an improved understanding of the uncertainties of place definition and perception, the shape of places and emotions are relevant and important research topics. A better understanding of the uncertainties can help to develop strategies for mapping places and their uncertainties in a GIS. Place-base GIS is still in its infancy; deeper discussions of these concepts are needed. Understanding and articulating emotions has been a research topic for a long time. However, just recently GIScience and cartography communities started exploring and challenging ways in which emotions, qualitative data in general and intangible data can be visualized on maps. Our paper aims to contribute to the debates and discussions on places, place-making and emotions felt at power places. An improved understanding of places

can help urban designers, urban planners, and architects design and plan better cities and places in which people feel positive emotions. Positive emotions contribute to better livable, more pleasant and happy cities and their citizens; a positive orientation for planning our future cities.

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