WHAT ABOUT THE SOUL OF THE CITY? APPLYING A RESIDENT PERSPECTIVE IN FOUR SWEDISH CITIES[1]

Marie H. Wahlström

Institute of Urban Planning and Environment, School of Architecture and the Built Environment

KTH - Royal Institute of Technology, Stockholm, Sweden

E-mail: mia.wahlstrom@abe.kth.se

Biographical Note

Marie H. Wahlström holds a master's degree in economics and is currently a Ph.D. student at the Department of Urban and regional studies at the Royal Institute of Technology in Sweden. Her research interest is related to urban/regional attractiveness and lies in the cross-section of urban economics, urban planning & design, and environmental psychology.

Abstract

This paper contributes to existing literature by developing a quantitative method for analyzing the city soul – a concept here used to study cities' distinguishing features. The method is based in theory and tested by means of a survey, in which ~2,500 households in Sweden answered questions about their city. Results from e.g. regression analysis indicate significant relationships between the perceived strength of a city's soul and the residents' relation to their city as well as their perceptions of its characteristics. Particularly, the city soul seems to be linked to feelings of pride, attachment and belonging and to city characteristics related to art, beauty and stories about the cities.

Keywords: place identity, urban amenities, city perceptions, residential satisfaction.

JEL Classification: R23, R59

---

1. Introduction

The intensified competition between cities as attractive places for high-ranked business activities, well-educated labor and visitors has increased the interest in city rankings among urban policy makers and planners. At the same time, and perhaps as a consequence, an increasing number of urban researchers from different disciplines have lately addressed questions related to distinctive features of cities and places. See for example Southworth and Ruggeri (2011) in urban design/planning, Mellander et al. (2011) in economics, Hauge (2005) in geography, Bell et al. (2001) in psychology, and Clark et al. (2002) in sociology.

As the research on distinctiveness is based in different research areas/traditions, a variety of concepts and perspectives are used in the academic literature. However, the increase among researchers is noted across perspectives and concepts: a simple Google Scholar search shows that the number of articles with titles including expressions like 'city identity', 'sense of place', 'city character', and 'city soul' have multiplied several times since the end of 1980's[2].

The psychological-sociological oriented studies are mainly focusing on the city users and the people-place relationships, and tend to leave out critical amenities like public services. Otherspay less or no attention to economic and physical city attributes (Lewicka, 2011). The basic starting point for this paper is that overriding concepts such as city identity or city soul should be related both to people-place relationships and to physical and functional city characteristics, in order to be useful to practitioners within urban planning and design. The aim of this paper is to develop and test a conceptual framework that makes it possible to relate such a concept to different aspects of the residents' relation to their city as well as to their opinion of the physical and functional city characteristics. Specifically, the residents' notion of city soul is used to analyze as to what extent these notions depend upon their opinions regarding various city characteristics and relational aspects.

The conceptual framework is explored and tested by means of resident surveys carried out in four Swedish cities. After a pilot survey, the final questionnaire was sent to a random sample of 6,600 residents. The empirical analyses are based on over 2,500 complete observations and a combination of factor and regression analysis. Overall, the results support the model framework and show that the residents' relation to their city seems to be more important than the city characteristics for their perceptions of the city soul. Specifically, the city soul appears to be strongly related to the relation aspects pride, attachment and belonging. The results also indicate that the characteristics

---

[2] Using (2017-02-13) 'city+soul', 'city+identity', 'place+identiy', 'place+soul', 'city+character', 'genius+loci' and/or 'sense+of+place' in the title of an article as search criteria the number of hits increased from around 300 to 4000 between the periods 1986-1995 and 2006-2017. The largest increase is observed for 'place+identity' from ~50 to ~1500 hits.

'Visible art', 'Beautiful city', and 'Stories' about the city are significantly related to the perceived strength of the city soul.

One contribution of this paper is the proposed methodology for linking sociological-psychological and economic-physical factors in order to explore an overriding concept like the city soul. Another is that it shows how this concept, which previously primarily has been studied through qualitative approaches, can be analyzed by quantitative methods. Furthermore, the empirical results contribute by providing further understanding of the complex way in which different factors influence the city soul as perceived by its residents.

The paper is organized as follows. After a brief overview of the related literature, the methodology and research questions are presented. Subsequently, results from the empirical analyses are described and discussed, while some concluding remarks are presented in the final section.

2. Literature review

This overview is structured around the concepts most frequently used when discussing distinguishing features of cities and places: place identity, city image and sense-of-place, and quality-of-life. The purpose is to illustrate the diversity of the concepts adopted by different disciplines and to give examples of interpretations rather than to provide a comprehensive picture.

2.1 Place identity

'Place identity' is discussed in literature within marketing/management, psychology, sociology, geography, as well as within urban planning and design. See for example Casakin and Bernardo (2012) and Kaymaz (2013) for an overview. Consequently, identity is interpreted and defined in a variety of ways.

According to geographer Relph (1976), the identity of a place is comprised of physical features, observable activities and functions, and meanings or symbols. However, it is not just the identity of a place that is important, but also the identity that a person or group has with that place. According to environmental psychologist Proshansky (1983), place identity is a sub-structure of self-identity, e.g. living in New York makes you gradually become a 'New Yorker'. In line with that, architect and geographer Knox and Pinch (2010) explain identity as the perception people have of themselves, and that space is crucial to all the processes of identity formation. Brown and Raymond (2007) describe place identity as the relation between the individual and the place. In 1981, urban planner/architect Lynch (as quoted in Southworth and Ruggeri, 2011) defined identity as the extent to which a person can recognize or recall a place as being distinct from other places,

having a vivid or unique, or at least a particular character of its own. As a recent example within marketing/branding research, Kavaratzis and Hatch (2013) suggest that place identity is created throughthe interaction of external and internal perceptions of a place, i.e. at the intersect of its image and culture.

Lately, researchers from different fields have proposed development of the concept. Urban planner Kalandides (2011) makes a distinction between using the term as part of individual or group identity, as mental representation of a place, as identification of a group with a territory, or as a sense-of-place. Southworth and Ruggeri (2011) suggest a new and more nuanced definition of place identity, including the idea that identity is a gradient rather than a dichotomy. Recently, Zenker and Pedersen (2014) proposed a model linking the identity of a place to the identification with a place to the relation with a place (place attachment).

2.2 Image

City or place 'image' is a central concept in most of the research regarding place marketing/branding. According to Kavaratzis and Hatch (2013), image is the external definitions of identity. Anholt (2010) suggests that images of places are formed through identity and behavior, i.e. who you are (identity) determines how you behave, and how you behave determines how you are perceived (image).

City image was early discussed by urban planner/architect Lynch (1960), who framed it quite different from later marketing and branding researchers. He relates the image of a city to perceptions, emotions, culture, and history as well as to the natural and built environment. According to him, identity is part of the image.

2.3 Sense-of-place

'Sense-of-place' is primarily used within environmental psychology, geography, urban design, and sociology.

Relph (1976) as well as Kalandides (2011) describe sense-of-place as one of the dimensions of place identity, constituting the very individuality and uniqueness of places. Relph seems to equate it with the spirit of place (genius loci[3]) and refers to it as the character or personality of place. According to urban designer and planner Jivén and Larkham (2003), there is a tendency within practical planning and design to work towards 'creating' a sense-of-place through elements

---

[3] Genius loci is an ancient roman concept that in contemporary usage usually refers to a location's atmosphere – the character of the place.

of historical forms. They argue that even though this may result in a place with identifiable character, sense-of-place is developed through the interaction between these elements and the people using them. Social psychologist and sociologist Jorgensen and Stedman (2006) consider sense-of-place a multidimensional concept and describe it as a summary evaluation of place identity (place-specific beliefs), place attachment (emotions) and place dependence (behavioral commitments).

Within environmental psychology, sense-of-place is often referred to as the emotional connection between people and their communities or to a particular emotional experience of a person in a particular setting (Bell et al., 2001).

2.4 Quality-of-life

Economists have since long tried to understand the location of firms and people in terms of the relative attractiveness of cities and places. They have for example tried to explain migration flows between cities by differences in income, supply of public service and housing (see e.g. Mellander et al., 2011, for an overview). Broadly defined quality-of-life factors have been acknowledged as important, e.g. cost of living, accessibility to work places and services, education and health, as well as crime, arts, recreation and climate. Examples are provided by Whisler et al. (2008), Glaeser et al. (2001), Gottlieb and Joseph (2006), and Florida (2008).

Relatively recent efforts have been made to introduce more place-specific characteristics into economic models, e.g. beautiful physical settings, life-style, entertainment, culture, openness, and tolerance (Florida et al., 2011, 2013). Place-based characteristics are often referred to as amenities: site- or region-specific goods and services that make localities more or less attractive (see e.g. Power, 2005). However, Niedomysl and Hansen (2010) suggest that place-specific characteristics becomes relevant mainly when jobs, affordable housing, and similar factors are fulfilled.

Within economic geography, the theory of place surplus has been used to relate cities' attractiveness to economic, human, cultural and social capital (Bolton, 2002; Westlund and Bolton, 2003). Westlund (2006) suggests that even though a large part of the place surplus (break-even or shortfall) can be explained by economic factors and access to goods, services and markets, the social capital of the place (social networks, norms, values and lifestyles) also plays a significant role.

2.5 City Soul

The concept 'city soul' in the sense of describing cities' distinguishing features, seems to be used and discussed more frequently among practical urban planners and developers than among researches. However, it occurred in the literature already 1905, when Ford Madox Hueffer wrote 'The Soul of London. A survey of a modern city'. Almost 20 years later Spengler (1923) wrote that, what distinguishes a town from a village is not size, but the presence of a soul.

Later, Andersson (1998) mentions city soul as synonymous with place identity and as being a part of the city's cultural capital, which in turn is one of the main comparative advantages for cities. Florida (2009) uses city soul to discuss the attachment people have to their communities. Both authors suggest that the soul of a city to a significant extent represents its uniqueness. Sociologist Zukin (2011) writes about the gentrification of New York and states that the city has lost some of its soul as a result of modernization and gentrification, and that New York as a consequence has become less authentic and more like other cities and therefore also less fascinating.

Another related concept is 'city buzz'. According to Florida (2012), the city's atmosphere or buzz is central to perceptions of vitality and economic growth. Successful cities are those that use a range of less tangible attributes to attract highly talented people.

2.6 Summary of literature review

The reviewed literature is summarized in table 1, where the last row presents the central aspects of each concept. *Physical aspects* refer to the built or natural environment, *functional aspects* to public and commercial services such as health care, education and jobs, while *emotional aspects* refer to feelings or relations attached to the city. It seems as if the psychological-sociological oriented studies mainly focus on the city users and the people-place relationship, while the economic and urban planning/design oriented studies typically emphasize the city's physical characteristics and functions.

Table 1. Some of the most frequently used concepts related to city distinctiveness within different research areas, alongside with a summary of their interpretations, main focus of research, main references, and the conclusions drawn regarding the central aspects of each concept.

	Place Identity	**City Image**	**Sense of Place, Place Character**	**Quality of Life**	**City Soul**
Main research areas	Environmental psychology, sociology, urban planning, architecture, geography, marketing/management	Marketing/ management, architecture	Anthropology, environmental psychology, architecture, geography, urban sociology	Economics, economic geography	Economics, economic geography and real estate economics
Main focus of research	To understand the human-place relationship	To understand how cities are perceived, city branding	To understand the human-place relationship	To understand what makes cities attractive and migration decisions	To understand what makes cities attractive, migration, city branding
Inter-pretations:	• Identification. As part of individual or group identity, identification of place or of a group with a territory • Sense-of-place • Comprised of physical features, functions, and meanings or symbols • Created from external image and internal culture/practices	• The outside description of a city • Image 'creates' identity together with culture • Related to perceptions, emotions, culture, history, and to the natural and built environment	• One aspect of place identity • Summary evaluation of place identity, place attachment and place dependence • The spirit of place- genius loci, based on history and stories • Authenticity	• Q-o-l: e.g. cost of living, job-outlook, education, health, crime, and climate • Placed-based (social or physical) amenities, e.g. physical setting, consumer services, life-style • Place surplus relates the city's attractiveness to its economic, human, cultural and social capital	• City soul as part of the city's cultural capital • City soul as a description of community belonging • City atmosphere/buzz • Authenticity
Main references:	Relph (1976) Proshansky (1983) Southworth & Ruggeri (2011) Kalandides (2011) Kavaratzis & Hatch (2013) Zenker &Pedersen (2014)	Lynch (1960) Kavaratzis & Hatch (2013) Anholt (2010)	Relph (1976) Bell et al (2001) Jivén & Larkham (2003) Jorgensen & Stedman (2006) Kalandides (2011)	Power (2005) Whisler (2008) Florida (2008) Florida et al (2011,2013) Mellander et al (2011) Westlund (2006)	Andersson (1998) Florida (2009, 2012) Zukin (2011)
Central aspects	Physical, functional and emotional aspects	Physical and emotional aspects	Emotional aspects	Functional and physical aspects	Physical, functional and emotional aspects

3. Methodology and research questions

This section presents the concept city soul and outlines its relationship to different city characteristics and aspects of the relation that residents have with their city. After specifying the research questions, the design of the survey and questionnaire is described.

3.1 City soul, city relation and city characteristics

When deciding on a concept to use in this research as a description of city distinctiveness, one criteria was that it should be possible to quantify, and another that it should consider physical, functional as well as emotional aspects. The latter is assumed important from an urban planning point of view as planners' role to an increasing extent involve understanding *how* people perceive and use places in addition to considering physical characteristics and functions of the place.

According to table 1, both 'place identity' and 'city soul' include physical, functional as well as emotional aspects. A combination of these two concepts will be used for the following reasons. The pilot study (see 'Design of the survey and questionnaire' below), which preceded the main survey indicated that the respondents had a rather strong willingness to describe the 'soul of their city' and that they tended to mix up 'identity' with 'image'. However, one disadvantage of the notion of 'soul' is that it might be difficult to express as more or less 'weak' or 'strong', which is preferred for a quantitative measure. As identity seems to be more quantifiable, the concepts identity and soul are combined in this study. In the following, to facilitate the reading of this paper, 'city soul'[4] will be used as a short version of the longer 'city identity/soul' and defined as follows: The city soul refers to a set of physical, functional and/or emotional characteristics that influence the residents' relation to their city as well as their perceptions of its distinctiveness.[5] It is further assumed that the city soul:

- can be described by both content and strength, i.e. can be described through different features and by a rating from very weak to very strong.
- can be expressed as a set of features within a certain spatial range.
- is based on individual opinions but can be collectively expressed as the sum of individual opinions within a city.

---

[4] For the remaining of this paper, 'City soul" is used synonymously with 'the soul of the city".
[5] 'City' refers to the urban space people use for different purposes, such as housing, jobs, entertainment. The geographical boundaries could be a city centre or a municipality. By way of comparison; region refers to a much larger area, and neighbourhood to a much smaller area.
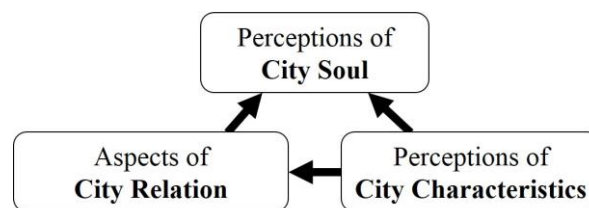
3.2 Conceptual model and research questions

According to the above definition, both city characteristics and aspects of the residents' relation vis-à-vis their city are important components of the city soul. The relation to the city might be influenced by the perception of physical and functional attributes. If so, it seems likely that the relation will be stronger the more the attributes are appreciated. Since it usually takes time to develop a relation, a related assumption is that 'natives' and 'newcomers' will differ in this respect.

The resulting conceptual model is presented in figure 1. It shows the resident's perception of the city soul as a function of two main components; the resident's relation to the city as well as the perceptions of its characteristics and it includes the link from the city characteristics to the city relation.[6]

Figure 1. Illustration of the conceptual model, which is based upon theory and a pilot survey: residents' perceptions of the city soul is influenced by the city characteristics directly and indirectly through aspects of their relation to the city.

By means of a quantitative survey, the following research questions will be addressed in this study:

(1) Does the survey support the conceptual model? I.e. are there significant relationships between the residents' perceptions of the city soul and the two components characteristics and relation?

(2) Which city characteristics influence the perception of the city soul?

(3) Which aspects of the relation influence the perception of the city soul?

3.3 Design of the survey and questionnaire

After an initial review of the literature, a preliminary questionnaire was constructed and tested through a pilot study of 1,300 residents in four Swedish cities. Open-ended questions were applied

---

[6] A third component has been covered by the survey, so called associations – based on short descriptions of features that can be associated with a city (e.g. 'open', 'green', 'authentic'). However, as initial analysis show that their relationship with city soul is rather weak, the associations have not been analyzed in this paper.

to understand how the city soul is perceived and described. The main study was developed based on evaluation of the result from the pilot.

The empirical material used in this paper was collected via a quantitative survey among residents in the Swedish cities Stockholm, Göteborg, Malmö, and Umeå having 912,000; 541,000; 318,000 respectively 120,000 inhabitants. The cities are located in different parts of the country and they differ regarding history, culture and character.[7]

Using stratified random sampling, 6,600 postal paper questionnaires were distributed during the fall 2014. 2,573 questionnaires were completed, corresponding to a response rate of 40 %. Further information regarding response rates and potential sources of bias is available upon request.

Perceptions of the city soul are assessed through two different questions. First, the respondents are asked to describe the soul of their city in their own words. Here, the wording 'city soul' is used instead of 'city identity/soul'. Secondly, the respondents are asked to evaluate the strength of their city's soul on a Likert scale. Here, 'identity/soul' is used instead of only 'soul' to facilitate the quantification.

The questionnaire holds 35 statements describing characteristics of a city in terms of perceptions. The statements mostly relate to physical and functional aspects but emotional aspects are included as well. E.g. "My city provides good child care and good schools" (functional), "It is nice to walk around in my city" (emotional) and "My city has good access to parks were it is nice to spend time" (physical and emotional). As the aim is to capture how the characteristics are perceived, to quantify and at the same time keep the questionnaire short enough, the perceptions sometimes encompass both a feeling and a physical aspect, e.g. nice parks, accessible water, etc. As another way to shorten the questionnaire, only positive statements regarding characteristics are included.[8] All statements are evaluated using a Likert scale 1-9, where 1 means 'I don't agree at all' and 9 means 'I totally agree'. It was also possible to answer 'I don't know/not relevant'. The choice of characteristics to include was inspired by Jacobs (1961), Bonaiuto et al. (2003), Florida et al.

---

[7] Stockholm is located on the east coast and Göteborg on the west coast, Malmö in the far south, and Umeå in the far north of Sweden. Stockholm is the capital and often described as the knowledge centre, while Malmö is part of a larger region that includes Copenhagen, Denmark. Both Malmö and Göteborg are old industrial cities. Umeå is the smallest of the four and today a popular student city. Malmö has the youngest citizens and the highest share of immigrants.

[8] The use of only positively phrased, value-loaded statements might be considered controversial. However, one advantage is that within a fix questionnaire length, more characteristics and aspects of the relation can be covered compared to if using both positive and negative aspects. An advantage with value-loaded statements is that they often are easier to interpret than more neutrallyphrased statements. By way of example; if a respondent agree fully to the value-loaded statement 'this city has good schools', it is quite clear that the schools are perceived as good, even though nothing can be said about what he or she means by 'good schools'. If a resident instead agree fully to the more neutral statement 'this city has a large supply of well-reputed schools' – it is hard to know if he or she perceive this as a good thing. Furthermore, as the aim of the study involves understanding the underlying patterns between the different items in the questionnaire as opposed to assessing or compare actual ratings on each item, the exact phrasing is probably not as important. Detailed information about the survey and questionnaire design can be retrieved from the author upon request.

(2011), Mellander et al. (2011), Zenker and Rütter (2014), Bell et al. (2001), Lynch (1960), Norberg-Schultz (1979), and Dobbins (2009).

Aspects of the respondents' relation to their city were assessed through seven statements regarding attachment, belonging, pride, satisfaction, loyalty and identification, using the type of Likert scale just mentioned. E.g. "I am overall satisfied with living in this city". These statements are inspired by Lalli (1992), Altman and Low (1992), Hidalgo and Hernández (2001), Brown and Raymond (2007), and Bonaiuto et al. (2003).

4. Results

After giving an overview of the data, the relationships between city soul, city relation and city characteristics will be analyzed.

4.1 An overview

Answers to the open-ended question "Describe the soul of your city in your own words" give some indications to the type of characteristics and relation aspects that are associated with the city soul. Almost three out of four respondents replied to the question, most of the answers were both quite worded and well phrased, and a majority seems to have a rather clear view of the phenomena city soul. Summarizing these answers[9], it can be concluded that the definition of city soul, which is mainly based on theory/literature, seems to be well in line with the perceptions of the respondents. By way of example, the following quote illustrates the importance of relation aspects: *"… the city is my hometown where I have always lived… I love my city, my streets and neighborhood, the parks where I played. They are the city's soul to me."*. There are also examples illustrating the importance of place-specific characteristics, such as this quote: *"History, beautiful buildings in the center, for the creative people within design and architecture, shopping and big events, water everywhere…"*. The descriptions made by respondents are by far more positive than negative but there are a few negative examples, such as: *"The water in Stockholm makes the city unique, the beautiful houses, the white boats…At the same time, it is a tough city with unfriendly people*."

As shown by table 2, the respondents have rather strong perceptions regarding the soul of their city; the mean is about 7 on the scale from 1 to 9. More statistics are available in appendix, table A1.

---

[9] The original answers in Swedish have been translated into English by the author.

Table 2. Summary statistics for "My city has a strong identity/soul", assessed using a Likert scale from 1-9, where 1 means 'I don't agree at all' and 9 means 'I totally agree'. It was also possible to answer 'I don't know/not relevant'. Weighted results for the Mean, Minimum value (Min), Maximum value (Max), and Standard Deviation (St.D). Unweighted results for the sample size (N).

Summary statistics for City Soul	Mean	Min	Max	St.D.	N
Total	6.9	1	9	1.88	2573
City of residence:					
Stockholm	7.3	1	9	1.71	1311
Malmö	6.8	1	9	1.91	384
Göteborg	6.9	1	9	1.85	421
Umeå	6.5	1	9	1.95	454

The differences in between the studied cities are small, yet Stockholm is perceived to have a significantly stronger soul than the others do. The difference between Göteborg and Umeå is also significant. The variation across cities may, at least partly reflect socio-demographic variations. Table A2 in appendix implies that newcomers in the city differ significantly from those born there: newcomers perceive the soul to be weaker. The same goes for men compared to women, whereas age does not have a significant influence.

The scatterplots in figure 2 provide an overview of the dependencies between the perceived strength of the city soul and the mean assessments of the relation aspects and city characteristics. The perceived strength of a city's soul seems to be significantly and positively related to both the mean score of the relation aspects and of the city characteristics. The more satisfied, loyal, proud, attached and at home you feel and/or the happier you are with your city's characteristics, the stronger is your perception of its soul. The observations regarding city characteristics are more spread out, and the correlation is thus weaker compared to the correlation between the city soul and the city relation ($r = 0.55$ vs. 0.72). This is anticipated, as a large variety of detailed characteristics is included in the survey.

The assumption that the perceptions of characteristics also influence the relation a resident has to the city seems to be confirmed by figure 2c – the higher the average rating of the characteristics, the stronger average assessment of the relation aspects.

Figure 2. Scatterplots illustrating the relationship between city soul and mean of relation aspects (a), mean of city characteristics (b), and between city characteristics and relation aspects (c). r=Spearman's correlation coefficient. Correlation is significant at the 0.01 level (2-tailed). The line illustrates the linear relationship according to OLS regression.
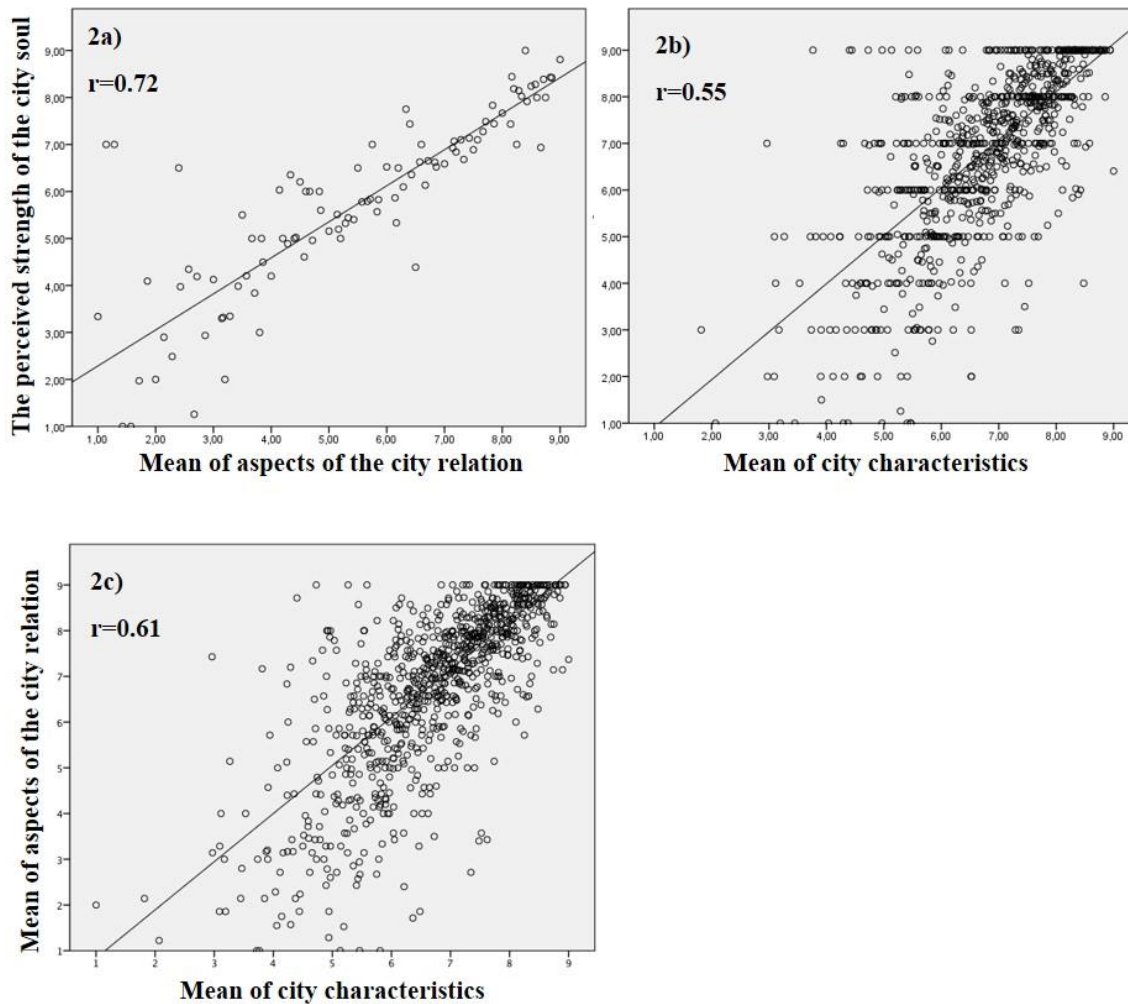
4.2 Analysis

The correlations indicated by the scatter plots above, are supported by linear regression analysis, using the city soul strength as dependent and both the mean of characteristics and relation aspects as independents. Both independents are significant, which indicates relationships with the city soul, though the relation seems to have a much stronger link. For residents born in the city (or living there since at least 30 years), the relation aspects' relative strength is even more obvious. The conclusion is that residents' relation to their city do not only develop and deepen over time, its influence on the perceived city soul also becomes stronger.

Linear regressions are also used to analyze the relative impact on the city soul rating from individual characteristics and relation aspects. The 35 characteristics evaluated by the respondents

would cause multicollinearity problems if they are all included in the regression model. Instead, principal component analysis (PCA) and theoretical considerations are used to select a set of suitable independent variables for regression, see Appendix, table A4.[10]

The regression results, using the perceived strength of city soul as dependent and the eleven selected variables as independents are given by table 3, column 1. The independents have significant influence in the city soul, with the exceptions 'City commitment', 'Easy access by public transport' and 'Cultural diversity'. The strongest[11] significant variables seem to be 'A story I'd like to tell', 'Beautiful city' and 'Visible art'.

Table 3. Results from linear regression analysis (OLS): 1) using the strength of city soul as dependent, selected characteristics as independents, 2) using the strength of city soul as dependent, selected characteristics and mean relation aspects (relation index) as independents, and 3) using the relation index as dependent, selected characteristics as independents. Unstandardized coefficients are reported for each independent.

	1) Dependent: City soul	2) Dependent: City soul	3) Dependent: Relation index
Constant	0.632*	0.291	0,538*
Nice places to meet	0.078*	0.041	0,058*
City commitment	0.028	-0.013	0,064**
A story I would like to tell	0.190**	0.087**	0,163**
Easy access - by public transport	0.041	0.023	0,028
A beautiful city	0.159**	0.032	0,200**
Housing at reasonable prices	0.036*	0.004	0,049**
A good reputation	0.062**	-0.034*	0,152**
Exciting experiences	0.088**	0.036	0,081**
Nice routes for biking/walking	0.091**	-0.016	0,169**
Visible (street) art	0.145**	0.140**	0,007
Cultural diversity	0.010	0.013	-0
Relation index		0.635**	
Adjusted R Square	0.358	0,547	0,458

Indicators of significance (2-tailed): * $p \leq 0.05$, ** $p \leq 0.01$. All VIF below 2.

In column 2, the relation component is added as an explanatory variable. The strong correlation between the seven aspects of the relation (attachment, belonging, pride, satisfaction, identification, loyalty- stay and loyalty – recommend) makes it impossible to include them all in the

---

[10] The PCA is based on all respondents that evaluated all 35 characteristics. Including the PCA factor scores directly in the regression would therefore result in a smaller base of respondents, compared to using separate variables as independents. This makes it difficult to run the regression on different subgroups of the data as the respondent base becomes too small to be reliable.

[11] The strength is measured by one standard deviation change in the independent variable.

regression model. For the same reason a PCA on the seven aspects results in one factor only and therefore the average rating is used as independent in the regression. This 'relation index' has a strong significant influence on city soul and improves R^2 considerably. 'A story I'd like to tell' and 'Visible art' are still significant and rather strongly related to city soul, while other characteristics are not, implying that their influence is only indirect via the relation index. This fortifies the result that the relation has a stronger influence on city soul than the characteristics.

Running the regression with the relation index as dependent and the selected characteristics as independents, results in most characteristics having a positive significant influence. See table 3, column 3. The strongest ones being 'Beautiful city', 'Nice routes for biking/walking', 'A story I'd like to tell', and 'A good reputation'. Similar analyses have also been conducted with each of the relational aspects as dependents - none had a R^2 higher than the one reported in table 3.

According to table 3, 'Visible art' has a significant influence on city soul (see column 1) but not on the relation index (see column 3), implying that 'Visible art' only influences city soul directly and not indirectly via the relation. Two characteristics do not seem to influence neither the city soul nor the relation: 'Easy access by public transport' and 'Cultural diversity'[12], while the rest of the characteristics at least have indirect influence on city soul.

Corresponding regressions on residents born or raised in the city ('natives') and residents that moved to the city ('newcomers') support that the city relation is of greater importance to the city soul rating among natives. Most relation aspects are also perceived as stronger among natives compared to newcomers. However, the influence from 'Visible art' seems to be stronger among newcomers. These regressions are not reported in this paper but can be obtained from the author upon request.

Several tests of robustness have been performed, running the city soul model with alternative independents; 'A vibrant 24h city' instead of 'Exciting experiences', 'Walkability' instead of 'Nice routes for biking/walking', 'Statues and symbols' instead of 'Visible art', and 'Religious institutions' instead of 'Cultural diversity'. The variables finally chosen have stronger influence on the strength of the city soul and generates a slightly higher R^2.

The research question regarding which aspects of the relation influences the city soul is difficult to answer as the aspects are highly correlated with each other. However, attempts to test the aspects one by one as independents in the city soul regression are reported in appendix, table A5. According to these regressions, 'Pride', 'Attachment' and 'Belonging' seem to be the relation aspects with the strongest influence on city soul.

---

[12] 'Cultural diversity' is not significant in any of the models with a relational aspect as dependent. 'Easy access by public transport' has a significant but very weak influence on the relational aspect 'Identification'.

The same regression models have also been applied to each of the four cities, as reported by table A6 in appendix, according to which there are significant effects on the strength of the city soul of the relation index in all cities. As shown by column a) for all cities in table A6, rather few characteristics have a significant impact on the city soul. However, there seem to be a direct effect from 'Visible art', 'Good reputation' is also significant in all cities. Moreover, the influence on city soul from 'A story I'd like to tell' and 'Beautiful city' is significant in three out of four cities. The strength of the influence differs between the cities, e.g. beauty is considerably stronger in Stockholm and story much stronger in Malmö. Additionally, Malmö differs by showing a negative impact on soul from 'A good reputation'. The respondents in Malmö have the lowest score on this characteristic compared to the residents in other cities. 'Nice routes for biking/walking' is only significant in Umeå, where the effect is indirect but rather strong.

One explanation behind the observed differences in-between the cities might be the respondents' socio-demographic profile. According to table A3 in appendix, the share of 'natives' differ and as the survey indicates significant differences between 'natives' and 'newcomers' it is possible that this affects the city-specific results. Running the city-specific regressions on 'natives' and 'newcomers' respectively show that the cities still differ with regards to which characteristics influence the city soul, especially so when analyzing 'newcomers'. However, the relation index is significant regardless of city and regardless of whether 'natives' or 'newcomers' are focus of the analysis. The model's explanatory value (adjusted R^2) seems to be higher for 'natives' in all four cities.

5. Discussion

The results presented in this paper support the conceptual model, which links the city soul to both aspects of the city relation and perceptions of city characteristics. The empirical analysis indicates that there is a strong connection between the perceived strength of the city soul and the relation to the city – feelings of proudness, attachment and belonging appear to be especially important. In line with Knez (2005), the results also indicate that the relation to the city is stronger for 'natives' than for 'newcomers'. The difference might be the result of a sorting process causing those establishing strong relations to stay in the city and the others to leave. It might of course also reflect that it takes time to build relations.

The perceptions regarding city characteristics are not as strongly but still significantly related to the strength of the city soul. Furthermore, the characteristics seem to influence the city soul both directly and indirectly via the relational aspects. The link between city characteristics and relational aspects is in line with earlier findings by e.g. Mellander et al. (2011) and Stedman (2002).

Characteristics that appear to have a significant (direct and/or indirect) influence on the city soul are primarily 'Visible art', 'A story I'd like to tell' and 'Beautiful city', even though the survey indicate differences between the studied cities.

The relatively simple theoretical model as well as the chosen set of questions to assess the characteristics and relational aspects, represent methodological limitations. The model does not take into account dynamic aspects. The citizens' perceptions of the city soul, of different city attributes, and of their relation to the city might interact over time in a way that is not captured by the applied static model. Another dynamic aspect is related to knowledge and experience of the city. Newcomers are likely to be more familiar with the neighborhood where they live than with the city as a whole. If so, the survey results may reflect their perceptions of the neighborhood rather than the city.[13]

Abstract associations, emotions and experiences (e.g. light or sounds creating a unique atmosphere) are left out in this paper even though they seem to influence the perceptions of the city soul, both according to the literature and to the survey presented here. Using a self-reported survey among residents is another limitation, as residents might tend to enhance the positive aspects of their city in order to verify their choice of hometown. Since the sample in this paper covers four Swedish cities, it is of course difficult to generalize the results to other cities in Sweden as well as other countries. However, the analytical approach and survey design might still be usable planners in other cities.

In this paper, it is assumed that it is desirable for cities to have a strong identity/soul. A strong soul could also be considered negative if for example it tends to exclude certain groups of people or is based on negative perceptions. The characteristics evaluated by the respondents in this survey are all described in a positive manner and the results thus indicate that a strong city soul is desirable as long as it is based on positive perceptions. If the questions would have been phrased in a different way, the results and interpretations thereof would perhaps be different.

6. Concluding remarks

Though based upon earlier research and an extensive survey addressed to a relatively large sample of city residents, this paper has merely touched upon the complexities involved when trying to analyze the city soul and its main components. Further research is needed both to develop the applied conceptual framework and to strengthen the link to planning practices. The focus on city residents implies that the views of visitors, firms, and other actors have been left out. Adding their

---

[13] The soul of the neighborhood and its relation to the soul of the city is studied in a separate paper.

perspectives would result in a more complete understanding of the city soul. Furthermore, the indicated differences in-between cities raise the need for research on larger samples, including more cities preferably also from different countries, in order to improve the reliability of the methodology. Additionally, planning of entire cities does not take place as frequently as planning of smaller areas. This calls for research on the soul of parts of the city, such as town districts or neighborhoods and their relation to the soul of cities. Finally, complementary research is needed to better understand the time perspective of city soul.

Having all caveats in mind, it should be possible to use the results for example as a basis for citizen dialogue when planning new or upgrading existing urban areas. The empirical results indicate the type of characteristics that are important components of a strong city soul and potentially influence the residents' relation to the city. Due to the difference between a city's natives and newcomers, it may be even more important to consider relational aspects when refurbishing existing areas. The relation's importance to natives is probably part of the explanation behind the so-called NIMBY phenomenon. As the city relation appear to play such an important role, it may be valuable for planners to collaborate more with urban sociologists and environmental psychologists.

References

Altman, I. and Low, S.M. (1992), *Place Attachment,* Plenum Press, New York.

Andersson, R. (1998), *Attractive cities. An Economic Analysis* (in Swedish), Byggforskningsrådet.

Anholt, S. (2010), *Places. Identity, Image and Reputation,* Palgrave Macmillian, UK.

Bell, P.A., Green, T.C., Fisher, J.D. and Baum A. (2001), *Environmental Psychology,* 5th ed., Psychology Press, Taylor and Francis Group, New York.

Bonaiuto, M., Fornara, F. and Bonnes, M. (2003), "Indexes of perceived residential environment quality and neighbourhood attachment in urban environments: a confirmation study on the city of Rome", *Landscape and Urban Planning,* Vol. 65, NO. 1-2, pp 41-52. Doi:10.1016/S0169-2046(0200236-0)

Brown, G. and Raymond, C. (2007), "The relationship between place attachment and landscape values: Toward mapping place attachment", *Applied Geography,* Vol. 27, No. 2, pp 89–111. Doi:10.1016/j.apgeog.2006.11.002

Bolton, R.E. (2002), "Place surplus, Exit, Voice and Loyalty" in B. Johansson, C. Karlsson and R.R. Stough (eds.), *Regional Policies and Comparative Advantages*, Edward Elgar Publishing Ltd., UK/USA

Casakin, H. and Bernardo, F. (2012), *The Role of Place Identity in the Perception, Understanding and Design of Built Environments.* Bentham Science Publishers. Doi: 10.2174/97816080541381120101

Clark, T.N., Lloyd, R., Wong, K.K. and Jain, P. (2002), "Amenities drive urban growth", *Journal of Urban Affairs*, Vol. 24, No. 5, pp 493-515. Doi: 10.1111/1467-9906.00134

Dobbins, M. (2009)*, Urban Design and People,* John Wiley and Sons, Inc., Hoboken, New Jersey.

Florida, R. (2008)*, Who's your city?,* Basic Books, New York.

Florida, R. (2009),"The soul of the city." *The Atlantic*, <http://www.theatlantic.com/national/archive/2009/10/soul-of-the-city/27526/>

Florida, R. (2012), *The Rise of the Creative Class, Revisited,* New York, Basic Books.

Florida, R., Mellander, C., and Stolarick, K. (2011),"Beautiful Places: The Role of Perceived Aesthetic Beauty in Community Satisfaction"*, Regional Studies,* Vol. 45, No.1, pp 33-48. Doi.org/10.1080/00343404.2010.486784

Florida, R., Mellander, C., and Rentfrow, P.J. (2013),"The happiness of cities", *Regional Studies,* Vol. 47, No. 4, pp. 613-627. Doi:10.1080/00343404.2011.589830

Glaeser, E.L., Kolko J., and Saiz, A. (2001), "Consumer City?", *Journal of Economic Geography,* Vol. 1, pp. 27-50. Doi:10.1093/jeg/1.1.27

Gottlieb, P.D. and Joseph, G. (2006), "College-to-Work Migration of Technology. Graduates and Holders of Doctorates within the United States*", Journal of Regional Science,* Vol, 46, No. 4, pp. 627-659. Doi: 10.1111/j.1467-9787.2006.00471

Hague, C. (2005),"Planning and Place Identity" in C. Hauge and P. Jenkins (eds.), *Place Identity, Participation and Planning*, Routledge, New York

Hidalgo, M.C. and Hernández, B. (2001),"Place Attachment: Conceptual and Empirical Questions." *Journal of Environmental Psychology,* Vol. 21, pp. 273-281. Doi:10.1016/jevp.2001.0221

Jacobs, J. (1961)*, The Death and Life of Great American Cities,* Modern Library, Random House of Canada Ltd, Toronto

Jivén, G. and Larkham, P.J. (2003), "Sense of Place, Authenticity and Character: A Commentary." *Journal of Urban Design*, Vol. 8, No. 1, pp 67-81. Doi: 10.1080/1357480032000064773

Jorgensen, B.S. and Stedman, R.C. (2006),"A comparative analysis of predictors of sense of place dimensions: Attachment to, dependence on, and identification with lakeshore properties." *Journal of Environmental Management,* Vol. 79, No. 3, pp. 316–327.

Kalandides, A. (2011), "The problem with spatial identity: revisiting the "sense of place"." *Journal of Place Management and Development*, Vol.4, No. 1, pp 28-39. Doi:10.1108/17538331111117142

Kaymaz, I. (2013),"Urban Landscapes and Identity" in M. Özyavuz (ed.), *Advances in Landscape Architecture,* Intech, Hırvatistan, pp. 739-760. Doi: 10.5772/55754

Knez, I. (2005), "Attachment and identity as related to a place and its perceived climate." *Journal of Environmental Psychology,* Vol. 25, pp 207–218. Doi:10.1016/j.jenvp.2005.03.003

Knox, P. and Pinch, S. (2010)*, Urban Social Geography. An introduction*, 6th edition, Pearson Education Limited.

Kavaratzis, M. and Hatch, M.J. (2013),"The dynamics of place brands: An identity-based approach to place branding theory", *Journal of Environmental Psychology,* Vol. 21, pp 273-281. doi:10.1006/jevp.2001.0221

Lalli, M. (1992), "Urban-related identity: theory, measurement, and empirical findings", *Journal of Environmental Psychology,* Vol. 12, pp 285-303.

Lewicka, M. (2011), "Place attachment: How far have we come in the last 40 years?" *Journal of Environmental Psychology*, Vol. 31, pp 207-230. Doi:10.1016/j.jenvp.2010.10.001

Lynch, K. (1960)*, The image of the city,* MIT Press, USA.

Mellander, C., Florida, R., and Stolarick, K. (2011),"Here to stay – The effects of community satisfaction on the decision to stay", *Spatial Economic Analysis*, Vol. 6, No. 1, pp. 5-24. Doi: 10.1080/17421772.2010.540031

Niedomysl, T. and Hansen, H.K. (2010),"What matters more for the decision to move: jobs versus amenities." *Environment and Planning A,* Vol. 42, pp. 1636-1649. Doi: 10.1068/a42432

Norberg-Schulz, C. (1979), *Genius Loci: Towards a Phenomenology of Architecture.* Rizzoli, NY.

Power, M.P. (2005),"The supply and demand for natural amenities: an overview of theory and concepts" in G.P. Green, S.C. Deller and D.W. Marcouiller (eds.), *Amenities and Rural Development. Theory, Methods and Public Policy,* Edward Elgar, Cheltenham, UK; Northampton, US.

Proshansky, H.M., Kaminoff, F., and Kaminoff, R. (1983),"Place-identity: physical world socialization of the self.*"Journal of Environmental psychology,* Vol. 3, pp 57-83. Doi:10.1016/S0272-4944(83)80021-8

Relph, E. (1976),"On the Identity of Places" in E. Relph (ed.), *Place and Placelessness.* Pion, London, pp 44–62.

Southworth, M. and Ruggeri, D. (2011),"Beyond placelessness. Place identity and the global city" in T. Banerjee and B. Loukaitousideris (eds.), *Companion to Urban Design,* Routledge, New York.

Spengler, O. (1923), *The Decline of the West. Perspectives of World History,* Alfred A. Knopf Publisher, N.Y.

Stedman, R.C. (2002),"Toward a social psychology of place. Predicting Behavior from Place-Based Cognitions, Attitude, and Identity." *Environment and Behavior*, Vol. 34, No. 5, pp 561-581.

Westlund, H. (2006), *Social Capital in the Knowledge Economy. Theory and Empirics.* Springer-Verlag, Berlin Heidelberg

Westlund, H. and Bolton, R.E. (2003), "Local social capital and entrepreneurship." *Small Business Economics,* Vol. 21, No. 2, pp. 77-113.

Whisler, R.L., Waldorf, B.S., Mulligan, G.F. and Plane, D.A. (2008),"Quality of Life and the Migration of the College-Educated: A Life-Course Approach." *Growth and Change*, Vol. 39, No 1, pp. 58-94. Doi:10.1111/j.1468-2257.2007.00405

Zenker, S. and Pedersen, S. (2014),"An integrative theoretical model for improving resident-city identification." *Environment and Planning A*, Vol. 46, pp 715-729. Doi: 10.1068/a46191

Zenker, S. and Rütter, N. (2014),"Is satisfaction the key? The role of citizen satisfaction, place attachment and place brand attitude on positive citizenship behaviour", *Cities*, Vol. 38, pp. 11-17. Doi: 10.1016/j.cities.2013.12.009

Zukin, S. (2011), *Naked city Death and life of authentic urban places* (in Swedish), Daidalos AB, Göteborg.

Appendix

Table A1. Summary statistics for city soul, city relation, city characteristics (all measured on a Likert scale 1-9, where 1 means 'I don't agree at all' and 9 means 'I totally agree'. It was also possible to answer 'I don't know/not relevant'), and socio-demographics. Total weighted results are reported for the Mean and Standard Deviation (Std.Dev.). Unweighted frequencies are reported for the missing and 'not relevant' responses.

	No response/ 'Not relevant'	Mean	Std. Dev.
City soul:			
My city has a strong identity/soul	235	6.88	1.88
Aspects of the city relation:			
Attachment: "I feel attached to my city, it is part of me "	153	6.77	2.12
Belonging: "I feel I belong in my city"	144	7.20	1.99
Pride: "I am proud of living in my city"	207	7.18	1.98
Identification: "I identify with the people living in my city "	235	6.15	2.13
Satisfaction: "In total, I am very satisfied with my city"	139	7.02	1.89
Loyalty – not move: "I'd rather not move from this city"	195	7.12	2.19
Loyalty – recommend: "I would definitely recommend a friend/relative to move to my city"	183	7.31	2.00
City characteristics ("*My city...*")*:			
Public services			
Good child-care and schools	906	6.11	1.84
Good health care	232	6.03	1.89
Good supply of sport, game etc. facilities	341	6.83	1.71
Safe and secure	108	5.79	2.08
Good reputation among people not living here		6.23	2.05
Commercial services			
Good supply of shopping	113	7.7	1.48
Good supply of culture	104	7.61	1.55
Good supply of restaurants /entertainment	108	7.82	1.4
Offers exciting experiences	243	6.66	1.86
Full of life, a 24-7 city	317	5.88	2.13
Good universities nearby	273	7.95	1.37
Meeting places			
Access to nice places to meet people	98	7.28	1.56
Access to cozy parks	81	7.53	1.57
Governance			
Listen to the citizens	644	5.23	2.01
Active work to improve air quality, reduce noise, etc.	488	5.76	1.96
Diversity			
Citizens from many different cultures and countries	121	7.92	1.51
A good supply of religious institutions	1522	6.8	2.13

*After the joint introduction "My city…", each statement began with a verb, such as "has" or "is". By way of example, the first statement is phrased "has good child care and schools" and the fourth "is safe and secure".

City characteristics (continued):	No response/ not relevant	Mean	St. Dev.
Image and stories			
A distinct image	357	6.44	1.93
A story I like to tell others	422	6.49	2.06
Getting around			
Easy to get to/around – by car	290	5.78	2.37
Easy to get to/around – by public transit	134	6.83	1.97
Easy to get to/around – by bicycle	410	7.22	1.91
Housing			
Good housing at reasonable price	182	3.47	2.24
Sustainable ("green") housing	982	4.25	2.14
Aesthetics			
Beautiful city	96	7.37	1.77
Beautiful houses, buildings	96	6.97	1.89
Cozy areas, neighborhoods	114	7.13	1.84
Attractions, places with a view, etc., that I warmly recommend	134	7.06	1.95
Walkability			
Nice to walk around in	87	7.36	1.61
Nice trails for walking/cycling	161	7.5	1.58
Natural environment			
Many and accessible larger green parks or green belt	130	7.35	1.7
Accessible, nice places close to the water	102	8.26	1.4
Symbolic features			
At least one building strongly associated with the city	166	7.92	1.75
Statues, signs, symbols that are associated with the city	224	7.16	1.98
Visible arts in public places, streets, on buildings, etc.	180	6.89	1.81

Table A2. Summary statistics for "My city has a strong identity/soul" (Likert scale 1-9, where 1 means 'I don't agree at all' and 9 means 'I totally agree'. It was also possible to answer 'I don't know/not relevant'). Weighted results for the Mean and Standard Deviation (St.D). Unweighted no. of respondents (N).

		Mean	St.D.	N
Total		6.9	1.88	2573
Age category	-39 years	6.9	1.78	756
	40-65 years	6.9	1.91	1066
	66+ years	6.9	1.94	730
Natives vs. Non-natives	Natives	7.1	1.84	847
	Moved here after 1986	6.7	1.84	1021
	Moved here after 2004	6.8	1.77	545
Gender	Males	6.7	1.86	1201
	Females	7	1.89	1372

Table A3. Statistics per city in sample; share of natives/newcomers, males/females, younger/middle-aged/elder, and share living inside/outside the inner city area.

		Stockholm	Malmö	Göteborg	Umeå
Natives vs. Non-natives	Natives	57.5%	57.8%	62.9%	67.8%
	Moved here 1987 or later	42.5%	42.2%	37.1%	32.2%
	Moved here 2005 or later	21.8%	25.3%	21.6%	15.6%
Gender	Males	45.5%	48.2%	45.1%	49.8%
	Females	54.5%	51.8%	54.9%	50.2%
Age category	-39 years	29.1%	30.5%	31.6%	28.5%
	40-65 years	41.1%	38.9%	44.7%	43.4%
	66+ years	29.8%	30.5%	23.8%	28.1%
Inner-city residents	Living within inner city area	100%	49%	32%	30%
	Living outside inner city area		51%	68%	70%

Table A4. Resulting factors from SPSS factor analysis on all 35 characteristics (using PCA - principal component analysis and varimax rotation), the number and type of characteristics related to each factor as well as the specific characteristics/items chosen for regression analysis.

Factor	Characteristics in each factor:	Items chosen as independent variables in the regression:
1) Aesthetics, Symbols and Nature	10 items related to: • Aesthetics (4) • Symbolic features (3) • Natural environment (2) & Walkability (1)	'A beautiful city' 'Visible (street) art' 'Nice trails for walking/biking'
2) Image and Stories	2 items: A distinct image and A story I'd like to tell	'A story I'd like to tell others'
3) Commercial services and Meeting places	8 items related to: • Commercial services (6) • Meeting places (2)	'Exciting experiences' 'Nice places to meet'
4) Public services	5 items related to: • Public services (3) • Reputation (1) • Safety (1)	'A good reputation'
5) Getting around	4 items related to: • Getting around (3) • Walkability (1)	'Easy access by public transportation'
6) Housing and Governance	4 items related to: • Housing (2) • Governance (2)	'Housing at reasonable prices' 'City commitment'
7) Diversity	2 items: Cultural diversity and Religious institutions	'Cultural diversity'

Table A5. Linear regression (OLS) using the strength of the city soul as dependent and selected characteristics as well as different aspects of the relation as independents 1) relation index, 2) pride, 3) attachment, 4) loyalty- not move, 5) satisfaction 6) belonging, 7) loyalty – recommend, and 8) identification. Unstandardized coefficients for each independent and adjusted R^2 for each model.

	1	2	3	4	5	6	7	8
Constant	0.291	0.543*	0.417	0.251	0.518*	0.193	0.480*	0.510*
Nice places to meet	0.041	0.049	0.060*	0.074*	0.030	0.067*	0.049	0.067*
City commitment	-0.013	-0.014	0.003	0.028	-0.030	0.021	-0.012	-0.004
A story I would like to tell	0.087**	0.098**	0.087**	0.152**	0.157**	0.118**	0.149**	0.132**
Easy access -by public transport	0.023	0.020	0.030	0.032	0.016	0.014	0.037	0.047*
A beautiful city	0.032	0.011	0.060*	0.099**	0.086**	0.073**	0.095**	0.108**
Housing at reasonable prices	0.004	0.023	0.022	0.029	0.018	0.018	0.019	0.001
A good reputation	-0.034*	-0.024	0.021	0.038*	-0.012	0.021	-0.027	0.004
Exciting experiences	0.036	0.045*	0.076**	0.067**	0.046*	0.057**	0.052*	0.058**
Nice routes for biking/walking	-0.016	-0.017	0.031	0.057	0.025	-0.002	0.024	0.055*
Visible (street) art	0.140**	0.149**	0.147**	0.154**	0.144**	0.155**	0.135**	0.137**
Cultural diversity	0.013	0.012	0.019	0.015	0.018	0.009	0.001	0.011
Mean of all relation aspects	0.635**							
Proud		0.552**						
Attachment			0.398**					
Belonging						0.417**		
Loyal - not move				0.227**				
Loyal - recommend							0.387**	
Satisfied					0.416**			
Identification								0.337**
R^2 Adjusted	0.547	0.553	0.493	0.412	0.457	0.492	0.462	0.464

Indicators of significance (2-tailed): * p ≤ 0.05, ** p ≤ 0.01. All VIF below 2.23.

Table A6. Linear regression per city. Column a) using the strength of city soul as dependent and selected characteristics as independents, b) adding the relation index as independents, and c) using the relation index as dependent and selected characteristics as independents. Unstandardized coefficients for each independent and adjusted R^2 for each model.

	Stockholm			Malmö			Göteborg			Umeå		
	a)	b)	c)	a)	b)	c)	a)	b)	c)	a)	b)	c)
Constant	-0.75	-0.23	-0,86	0.57	1 155	-0.89	1 18	0.90	0.41	-0.61	-1 28*	1.12*
Nice places to meet	0.08	0.04	0,07	0.04	0.01	0.06	0.13	0.08	0.07	-0.11	-0.08	-0.05
City commitment	0.04	0.01	0,04	0.07	-0.01	0.12*	-0.01	-0.03	0.03	0.06	0.01	0.09
A story I would like to tell	0.13**	0.07**	0,10**	0.29**	0.06	0.34**	0.20**	0.09*	0.15**	0.03	0.00	0.04
Easy access - by public transport	0.05	0.01	0,06*	0.07	0.04	0.04	0.01	0.00	0.01	0.05	0.04	0.02
A beautiful city	0.38**	0.12	0,43**	0.07	-0.03	0.15*	0.17**	-0.08	0.37**	0.15*	0.06	0.14**
Housing at reasonable prices	0.04	0.02	0,03	0.08	0.04	0.07	0.03	-0.03	0.10*	-0.03	-0.02	-0.03
A good reputation	0.12**	0.05	0,11**	-0.11*	-0.14**	0.05	0.16*	0.05	0.16**	0.41**	0.17*	0.41**
Exciting experiences	0.08*	0.00	0,14**	0.13	0.09	0.06	0.02	-0.09	0.15**	0.15*	0.14**	0.01
Nice routes for biking/walking	-0.02	0.02	0,12**	0.09	-0.01	0.11	-0.03	-0.01	0.07	0.21**	-0.01	0.31**
Visible (street) art	0.10**	0.08**	0,04	0.15*	0.14*	0.01	0.21**	0.25**	-0.06	0.20**	0.18**	0.04
Cultural diversity	0.09	0.02	-0,06*	0.04	-0.04	0.14	0.00	-0.04	-0.03	-0.10	0.03	-0.14*
Relation index		0.60**			0.66**			0.68**			0.60**	
R^2 adjusted	0.30	0.48	0.36	0.34	0.54	0.51	0.37	0.59	0.53	0.46	0.60	0.48

Indicators of significance (2-tailed): * $p \leq 0.05$, ** $p \leq 0.01$. All VIF below 2.23.[14]

---

[14] Most VIF values are below 2 and those above 2 are still less than 2.23. The highest VIF are found in Umeå, probably caused by correlation between 'Nice places to meet' and 'Exciting experiences' (the correlation coefficients is 0.58) as well as between 'A beautiful city', 'Nice routes for biking/walking' and 'A good reputation' (about 0.52).