

# **Livable and Sustainable Cities**

Explorations of the City Soul and Energy-Efficient  
Housing based on Swedish Data on Citizens'  
Preferences

MARIE H. WAHLSTRÖM

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Division of Urban and Regional Studies  
Department of Urban Planning and Environment  
School of Architecture and the Built Environment  
KTH - Royal Institute of Technology  
SE-100-44 Stockholm  
Sweden

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## **Abstract**

Contemporary cities face many challenges, none the least from an urban planning perspective. Global climate change is putting pressures on planning for combatting and adapting to a warmer climate, increased levels of rainfall, etc. Urbanization urges planners to satisfy an increased need for housing in an already dense environment, without compromising the livability of neighborhoods.

The overall theme of this thesis is the livability and sustainability of cities. The aim is to contribute to a more comprehensive understanding of residents' opinions and preferences regarding various aspects of livability and sustainability. Specifically, two of the four included papers discuss energy efficient housing and two the identity/soul of the city and its neighborhoods. The papers are empirically oriented and rest on relatively large quantitative materials.

All data used are Swedish. The papers might still be internationally interesting considering Sweden's relatively long tradition of ambitious urban planning and environmental policy. The database used in the first two articles contains around 77,000 observations of individual households and single-family homes. The residential survey used in the two final papers was sent to a random sample of 6,600 residents in four cities, and the final dataset contains complete responses from over 2,500 individuals.

Regression analysis is the primary analytical method used in all papers. The results indicate a preference for sustainable housing, in terms of a significant willingness to pay for heat pumps, i.e., for attributes that both reduce the energy consumption and are easily observed when visiting the house. The results further show that the perception of a strong city soul is linked to feelings of positive relations to the city as well as to positive perceptions of its physical characteristics. In particular, feelings of attachment, belonging, and pride as well as perceptions of aesthetics, arts, and symbolic features, seem to be linked to a strong city soul. Similar results are found regarding the neighborhood soul.

The research presented in this thesis contributes to related literature in several ways. It provides insight to Swedish residents' preferences and opinions concerning both energy-efficient housing and the soul of the city and its neighborhoods. All in all, the four papers show that a citizen perspective based on carefully designed databases and appropriate analytical tools can be used by planners to gain new insights supporting urban livability and sustainability efforts.

## **Keywords**

Attractive cities, place identity, green housing, urban planning, quantitative studies, residential satisfaction.



## Sammanfattning

Städer står idag inför många utmaningar, inte minst från ett stadsplaneringsperspektiv. Globala klimatförändringar ställer krav på minskade utsläpp och anpassning till ett varmare klimat, ökade regnmängder, etc. Urbaniseringen innebär att ett ökat behov av bostäder måste tillgodoses utan att livskvaliteten försämras i redan tätbebyggda områden.

Avhandlingens övergripande tema är städers attraktivitet och det huvudsakliga syftet är att bidra till en större förståelse för invånarnas åsikter och preferenser när det gäller olika aspekter av hållbarhet och "livability" (som kan översättas till goda levnadsförhållanden). Två av de fyra inkluderade artiklarna diskuterar energieffektiva bostäder och två av dem stadens och stadsdelens identitet/själ.

Det empiriska materialet i artiklarna kommer ifrån Sverige. Resultaten kan trots detta vara intressanta i ett internationellt perspektiv, bl.a. med tanke på Sveriges relativt långa tradition av ambitiös stadsplanering och miljöpolitik. Alla analyser baseras på relativt stora kvantitativa material. Den databas som används i de två första artiklarna innehåller cirka 77 000 observationer av enskilda hushåll och småhus. I de två sista artiklarna används en enkätundersökning som skickades till ett slumpmässigt urval av 6 600 invånare i fyra städer. Den slutliga databasen innehåller kompletta svar från mer än 2 500 personer.

Primärt har regressionsanalys använts för att förstå invånarnas attityder och preferenser när det gäller energieffektiva bostäder och stadens/stadsdelens själ. Resultaten indikerar att det finns en preferens för hållbart boende i form av en signifikant vilja att betala för värmepumpar, dvs för bostadsattribut som både minskar energiförbrukningen och enkelt kan observeras i huset. Resultaten visar vidare att invånarnas upplevelse av sin stads identitet/själ är positivt kopplad till deras känslomässiga relationer till staden och till att de uppskattar dess fysiska egenskaper. Specifikt är det känslor som tillhörighet, hemmakänsla och stolthet samt upplevelser av estetik, konst och symboler som är signifikant kopplade till en stark identitet/själ. Liknande resultat observeras även för stadsdelens själ.

Avhandlingen bidrar till befintlig relevant litteratur på flera sätt. Den stöder tidigare studier som visar att energieffektiva bostäder och en stark identitet/själ är aspekter av attraktiva städer. Sammantaget visar de fyra artiklarna att ett medborgarperspektiv baserat på noggrant utformade databaser och lämpliga analysverktyg kan användas för att få nya insikter med målet att skapa hållbara städer med goda levnadsförhållanden.



## Contents

<b>1. Introduction .....</b>	<b>12</b>
<b>2. Theoretical and Methodological Points of Departure .....</b>	<b>15</b>
<b>3. Literature Overview.....</b>	<b>17</b>
<b>3.1 Energy Consumption and Price Premium on Green Housing         (paper no. 1 and 2).....</b>	<b>17</b>
<b>3.2 The identity/soul of the city and its neighborhoods         (paper no. 3 and 4).....</b>	<b>18</b>
<b>4. Summary of Papers .....</b>	<b>19</b>
<b>4.1 Energy Consumption and Price Premium on Green Housing .....</b>	<b>19</b>
4.1.1 Paper no. 1: Residential energy consumption and conservation.....	19
4.1.2 Paper no. 2: Doing good but not that well? A dilemma for energy conserving homeowners.....	21
4.1.3 Discussion and Conclusions.....	22
<b>4.2 The identity/soul of the city and its neighborhoods.....</b>	<b>24</b>
4.2.1 Paper no. 3: What about the Soul of the City? Applying a Resident Perspective in four Swedish Cities.....	24
4.2.2 Paper no. 4: The Soul of Urban Neighborhoods and its Relation to the City Soul.....	26
4.2.3 Discussion and Conclusions.....	27
<b>5. Overall Discussion and Concluding Remarks.....</b>	<b>29</b>
<b>6. References.....</b>	<b>32</b>





## Papers

- Paper 1 Wahlström, M.H. and Hårsman, B. (2015) Residential energy consumption and conservation. *Energy and Buildings*, 102, 58–66
- Paper 2 Wahlström, M.H. (2016) Doing good but not that well? A dilemma for energy conserving homeowners. *Energy Economics*, 60, 197–205
- Paper 3 Wahlström, M.H. (2017) What about the Soul of the City? Applying a Resident Perspective in four Swedish Cities. *Romanian Journal of Regional Science*, Vol. 11, No. 1, Summer 2017
- Paper 4 Wahlström, M.H. (forthcoming) The Soul of Urban Neighborhoods and its Relation to the City Soul. *Not yet submitted*.

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# 1. Introduction

Contemporary cities face many challenges; none the least from an urban planning perspective. Global climate change is putting pressures on planning for combatting and adapting to a warmer climate, increased levels of rainfall, more frequent heat waves, etc. Urbanization urges planners to satisfy an increased need for housing in an already dense environment, without compromising the livability of neighborhoods. These concerns of urban planning today are described by, e.g., Healey (2010). Put into a historical perspective, urban planning (research and practice) has undergone substantial development since the 19th century. During the late 1800s, planning focused on control, aiming at creating order and improving health conditions in the segregated and crowded cities of the industrialization era. Other concerns were issues related to water/sewage, (fire) safety, and waste management. Around the turn of the century, a more progressive era started, and the birth of planning could belong to this period (Campbell, 2017). After World War II, the great need for reconstructing cities, at least in Europe, entailed intense planning.

In Sweden, the 1947 Building Act stipulated that each municipality should have a comprehensive plan for the long-term development, implying a substantial influence on the municipalities' built environment, economy and living conditions (Holm, 1985). Energy use and environmental protection started to become important, supported by public awareness and increasing political backing during the late 60s and the 70s (Wramner, 1985; Engström, 1985). The planning 'excitement' slowed down during the 70s, which might partly be explained by an increasing criticism of planning being too bureaucratic and technocratic, i.e., not caring enough about the people (see, e.g., Blücher, 2001; Hägerstrand, 1970).

During the post-modernistic era of the 80s, planners focused increasingly on communication and collaboration. It is also during this decade that the concepts 'New urbanism' and 'Sustainability' emerge (Campbell, 2017). 'New urbanism' refers to an urban design movement that started in the US already in the 60s, promoting environmentally friendly, walkable, mix-use neighborhoods and city centers. The concept of sustainability exploded with the Brundtland report 1987 and has been a central topic in planning discourse since then. In Sweden, nature conservancy and environment planning became a part of comprehensive municipal planning during the 80s. However, already in 1972, a special central government board was established in Sweden with the responsibility to scrutinize and issue permits for the polluting industries (Holm, 1985). Sustainability has been and still is at the forefront of national, regional as well as global urban policy.<sup>1</sup> Today, the focus may have shifted somewhat, from climate-related aspects to issues connected to social

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1 In 2015, UN member countries adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals. 'Sustainable cities and communities' is one of these goals; to make cities inclusive, safe, resilient and sustainable. At the UN conference on housing and sustainable urban development (Habitat III) in 2016, urban planning and design were among the key elements considered.

sustainability.<sup>2</sup> Whether focused on sustainability or livability, contemporary urban planning aims to benefit all residents, not merely a few.

As indicated by the title, the overall theme of this thesis is the livability and sustainability of cities. This might be considered a rather challenging start, as these concepts by now have been studied in numerous ways - accompanied by almost countless definitions and interpretations. Above all, the understanding of livable and sustainable cities will differ depending on who you ask. Architects may, for example, emphasize the physical setting as well as the design of buildings and public spaces as important aspects (e.g., Lynch, 1981; Southworth and Ruggeri, 2011), while sociologists might pinpoint equity and social relations between citizens (e.g., Clark et al., 2002). Economists, who historically focused on agglomeration effects such as accessibility to different markets, nowadays also seem to stress place-specific amenities such as attractive housing, beautiful views, culture, safety, and creativity, as well as resilience to climate change. Examples are provided by, e.g., Glaeser et al. (2001), Andersson and Andersson (2006), Florida (2008), Mellander (2008), and Andersson et al. (2014).

As a result of globalization, cities appear to become more and more alike, and therefore it seems reasonable that place-specific and other distinguishing features will turn out to be even more important aspects of city livability. In 1991, the Institute of Future Studies arranged a conference in Stockholm called “The Soul and Form of the City” where related issues were discussed and later published in a special edition of the institute’s magazine.<sup>3</sup> Another example is Andersson (1998) who mentions the distinctiveness/character of a city - also referred to as its identity or soul – as a valuable comparative advantage. Perhaps inspired by Jane Jacobs (Jacobs, 1961), urban planners commonly focus on physical and functional features when discussing the livability and sustainability of cities. However, they increasingly seem to refer to intangible aspects such as the importance and social value of people’s intangible investments in their neighborhood and city: “Place qualities are formed through encounters between our material experiences of our life surroundings and the meanings we make of these.” (Healey, 2010, p. 34.)

According to Healey (2010), urban planning responds to people’s concerns about improving the conditions of life and reducing the environmental stress that human activity generates. In line with Healey, this thesis emphasizes the role of people in planning. The overall aim is to contribute to a more comprehensive understanding of residents’ opinions and preferences regarding various aspects of livable and sustainable cities. As illustrated in figure 1, sustainability and livability are explored in terms of ‘green’ housing and distinguishing features of the city. Specifically, two of the four included papers discuss energy efficient

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2 Social sustainability was discussed already in the Brundtland report 1987, alongside ecological and economical sustainability. The aim of the UN Sustainable Development Goal ‘Sustainable cities and communities’ is that a revived urban planning will optimize economies of agglomeration, promote sustainable density, encourage social diversity and mixed land uses, foster inclusiveness, maximize heterogeneity, promote livable public spaces and vibrant streets, and thus make the city more functional, maintaining environmental balances. (<http://www.un.org/sustainabledevelopment/cities/>). A simple Google Scholar search also shows that the number of articles with “planning+social+sustainability” in the title has increased from zero between 1977 and 1986, to almost 50 during the last ten years.

3 The conference is documented in a special issue of *Framtider* – a publication edited by the Institute for Future Studies (*Framtider*, 3/91).

housing (chapter 2 and 3) and two of them the identity/soul of the city and its neighborhoods (chapter 4 and 5).

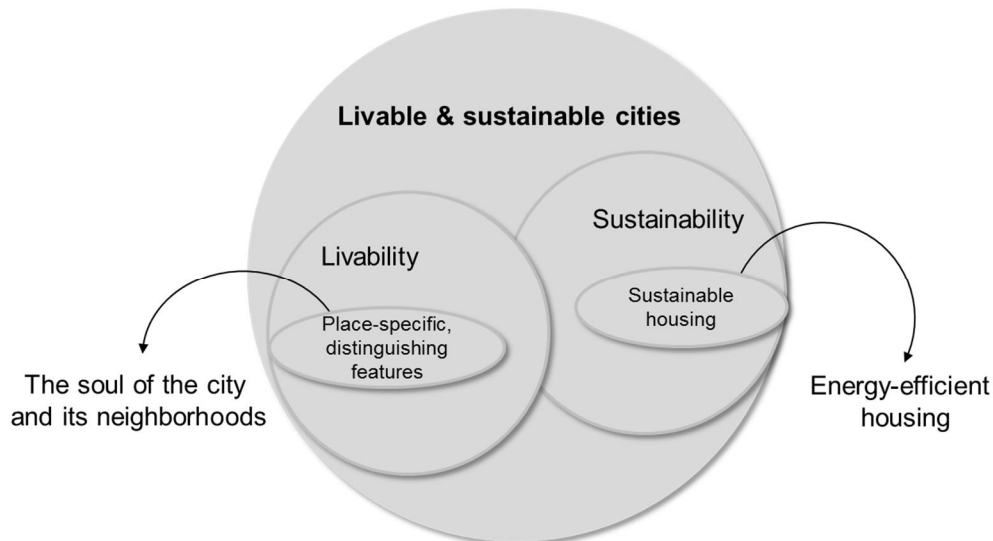


Figure 1. Illustration of the overall theme of the dissertation and the two orientations covered by the included papers: energy-efficient housing (chapter 2-3) and the soul of the city and its neighborhoods (chapter 4-5).

Housing plays an important role for both urban livability and urban sustainability. The choice of residence corresponds to a choice of neighborhood and accessibility to public and private services, and the residential sector accounts for a substantial part of the overall final energy use.

A citizen perspective is the basic point of departure in all four papers. The papers underline the importance of a 'bottom-up' or 'citizen first' approach in urban planning and demonstrate ways of accomplishing this by means of carefully designed databases and different methods for micro-based analysis.

A major research challenge is that the individual perspective still seems to be suppressed in quantitative research about city livability and sustainability. One reason being the lack of data concerning the values and preferences of the citizens. As a consequence, a substantial part of my research has been devoted to design and implementation of citizen surveys and to find and combine individual data from official sources. My challenge has also been to include two related but rather different components of livable and sustainable cities, which has involved drawing upon literature from a broad spectrum of research areas and disciplines – from engineering papers linking heat balance equations with energy-efficient housing to psychological articles on people-place bonding.

Throughout the papers, the intention has been to use a multidisciplinary and integrated approach, which is rather unusual in previous quantitative research on residents and can, therefore, be considered a contribution to the field. By way of example, the studies on energy-efficient housing make use of earlier findings from the engineering, economic and architect disciplines. Similarly, the studies on the soul of the city and its neighborhoods

integrate knowledge within urban planning and economics with psychology and sociology to achieve a more comprehensive understanding of city distinctiveness.

All data used in the four papers are Swedish. They might still be internationally interesting considering Sweden's relatively long tradition of ambitious urban planning and environmental policy. Furthermore, Sweden and its capital Stockholm usually achieve rather high rankings when it comes to both sustainability and livability.<sup>4</sup>

This first chapter will continue with the thesis' theoretical and methodological points of departure, after which an overview of the literature is presented followed by summaries of each paper. The chapter ends with an overall discussion and some overarching conclusions.

## **2. Theoretical and Methodological Points of Departure**

In line with Healey (2010), I believe that "promoting more livable and sustainable places is an important project for the twenty-first-century world of high-urbanized societies" (Healey, 2010, p. xii) and can, therefore, be considered important steps to improve the well-being of citizens as well as cities. In spite of this normative starting point, my take on urban planning is that it has limitations when it comes to fulfilling such goals. I would like to agree with Holm (1985), who wrote that those "who regard planning more as a compass for careful cruising towards a shimmering future goal, feel that it is a meaningful and necessary activity." (Holm, 1985, p. 20.)

Building upon the contemporary understanding that urban planning is for people this thesis is based on the individuals, i.e., trying to understand their motives, attitudes, and preferences. From this point of departure there are two main approaches available to increase the knowledge about individual citizens; revealed preferences techniques and stated preferences techniques. The stated preference approach relies upon the statements people make about, for example, their preferred mode of commuting or how much they are willing to pay for different types of housing. The revealed preference approach starts from the actual behavior regarding, e.g., the price paid for a house, to draw conclusions about the buyers' preferences concerning, for instance, housing attributes such as the size or energy performance.

The first two papers of the thesis rely on revealed preferences by making use of a housing database with information about the house transaction price, its energy performance, other building features, and neighborhood characteristics. The other two papers rely on the stated preferences technique; the analyses are based on postal surveys to city residents regarding their perceptions of qualities in their city and neighborhood. These two techniques each have their strengths and weaknesses (see for example Adamowicz et al., 1992). Assessing behavior and reactions through revealed preferences supposedly means coming closer to the actual behavior. However, it is often difficult to create a database of individual data, and, as it reveals 'historical' behavior little can be said about future behavior related to new types of

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4 According to for example the OECD: [www.oecdbetterlifeindex.org/countries/sweden/](http://www.oecdbetterlifeindex.org/countries/sweden/), the Monocle: [www.monocle.com/search/top-25-cities/](http://www.monocle.com/search/top-25-cities/), the Economist Intelligence Unit: [www.eiu.com/public/Liveability2016](http://www.eiu.com/public/Liveability2016), and Mercer: [www.imercer.com/content/mobility/rankings/](http://www.imercer.com/content/mobility/rankings/)

goods and services, or to other new phenomena. Stated preferences might, on the other hand, indicate future behavior and preferences regarding new offerings and phenomena. However, the indications, often based on surveys of attitudes, are by definition hypothetical and thus tend to be biased as well as uncertain. See McLeod (2014), for an overview of theories regarding attitudes and their critiques, and also Kahneman (2011).

All papers are empirically oriented and rest on relatively large quantitative materials. The database used in the first two articles contains around 77,000 observations of individual households and houses described by over 200 variables. In accordance with Swedish legislation (aiming at protecting individuals' integrity) the data was cleaned from information that could compromise the anonymity of the households. The database covers all energy performance certificates (EPCs) issued for single-family houses sold during 2009 and 2010.<sup>5</sup>

The residential survey used in the two final papers was conducted during the fall of 2014. A questionnaire including more than 100 questions was sent to a random sample of 6,600 residents in four cities. The final database contains complete responses from more than 2,500 individuals. It does not include information that would make it possible for anyone but the author to link a respondent to a particular individual.<sup>6</sup> A cover letter informed the respondents about the nature and aim of the survey, that their participation was entirely optional, and that their responses would be treated anonymously. In the questionnaire, the combined concept 'identity/soul' is used to capture the residents' perceptions of their city's and neighborhood's distinctiveness. The reason for using this combination is dual. A pilot survey, conducted prior to the main survey reported in this thesis, indicated that even though 'identity' appeared quite easy for the respondents to quantify, it also seemed vague and readily misinterpreted. Through open-ended questions, the pilot further indicated that the respondents, without any major difficulties, described their city's and neighborhood's 'soul'. As a result, the main survey holds two separate questions that refer to the residents' perceptions of their city's and neighborhood's soul. One is open-ended, asking the respondents to describe the soul of their city and neighborhood, respectively, in their own words. The other question asks the respondents to value the strength of their city's as well as neighborhood's identity/soul, using a nine-point Likert scale.

Besides the papers' relevance for city attractiveness, in terms of livability and sustainability, they are methodologically related. All analyses aim at understanding the preferences of individuals, on a micro, meso, and macro level. The micro level is apparent in the first two papers, focusing on single-family houses. The third paper applies a macro context, focusing on cities, while the meso level is dominant in the fourth paper, which focuses on

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5 It should be mentioned that the certificates have been developed since 2010. One important development concerns the summary available on the EPC, which since 2014 shows the energy classification of the house from A to F instead of only the standardized energy consumption in kWh. Furthermore, it is by now compulsory to state the average energy consumption in the ad when selling the house.

<http://www.boverket.se/sv/byggande/energideklaration/energideklarationens-innehall-och-sammanfattning/>  
<http://www.boverket.se/sv/byggande/energideklaration/energideklaration-om-du-ska-kopa-eller-salja/annonsering/>

6 The author has the theoretical possibility to link the respondents to their name and address via the identification number that can also be found in the sample database. This link has been kept in order to have the ability to check the data for inconsistencies or data processing mistakes.

neighborhoods. The primary analytical method used in the first two papers is regression analysis, while the final two papers combine regression analysis with principal component analysis.

### **3. Literature Overview**

The following literature overview provides a brief summary of previous research within the two main themes of the thesis and discusses the choice to include or exclude certain literature (see each paper for thorough literature reviews). The overview is structured in the following way: literature related to the first two papers of the thesis is discussed in the first section and literature linked to the final two papers in the next section.

#### **3.1 Energy Consumption and Price Premium on Green Housing (paper no. 1 and 2)**

The overall aim of the two energy papers is to investigate to what extent energy consumption and conservation are influenced by attributes of the house and by its residents. Furthermore, the question of a price premium on 'green' housing is addressed. From an empirical point of view, the starting point was the question if and how the Swedish energy performance certificates for single-family housing could be used for this purpose.

As described by Swan and Ugursal (2009), the frameworks commonly used to analyze residential energy consumption can be grouped into top-down and bottom-up approaches. The top-down approaches are based on an aggregated view and usually relate the energy consumption of the residential sector to factors such as gross domestic product, fuel prices, new construction and demolition of housing, and to climate conditions. The bottom-up studies are also of two types: based on building physics and engineering methods, see, e.g., Kavgić et al. (2010) or based on statistical analysis relating energy use to housing attributes and resident characteristics, see, e.g., Guerra Santin et al. (2009). My two papers belong to the latter group of studies.

A large number of studies have addressed the question of a price premium on 'green' buildings. Focusing on residential buildings, these studies can be divided into two categories; the ones that relate house prices to a 'green' label or energy performance index and those that explicitly consider different components of the energy system including the energy consumption. The 'green' index studies typically analyze buildings having a set of attributes fulfilling the requirements stipulated by some professional organization or government agency (see summary in Hyland et al. 2013). These studies are superior in number and often compared, even though they differ regarding the definition and base for the index. Among the second type of studies, the ones explicitly relating components of the energy system to the house price seem to be few and mostly based on Swedish data (Högberg, 2013; Cerin et al., 2014; Mandell and Wilhelmsson, 2011).

Reading the energy-related literature, it was interesting, while somewhat disappointing to note that there are very few references across disciplines. By way of example, no paper published in economic journals refers to papers in engineering journals and vice versa. From that point of view, my two papers are without doubt novel.



### **3.2 The identity/soul of the city and its neighborhoods (paper no. 3 and 4)**

The overall aim of my two papers is to develop and test a conceptual model for city distinctiveness, linking the city and neighborhood soul to the residents' perceptions of physical and functional characteristics, as well as to their relation to the city and neighborhood.

Research on place distinctiveness is based in different research areas and, consequently, several concepts and perspectives are used. The literature reviews in my papers are structured around concepts used within urban planning, urban design, geography, economics, environmental psychology, sociology, and marketing. 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. Some of the most frequently used concepts in this literature are 'place identity', 'place image', 'sense-of-place', and 'quality-of-life'. The concept 'city soul' is rarely applied.

My two papers, dealing with the soul of cities and neighborhoods, rest on the assumption that the city soul can be interpreted as an expression of a city's or a neighborhood's specific features, i.e. features that distinguish one place from another.

Marketing literature seems less relevant since it often is concerned with the external perceptions of the city, communication, and branding and the purpose here is to identify internal 'building blocks' of the soul of cities and neighborhoods. As a result, the literature reviews have few marketing references. Furthermore, urban design studies that focus on distinct features of smaller places, such as, e.g., plazas/squares, have been kept to a minimum in order to concentrate on the supposedly more complex entities as a neighborhood or an entire city. The psychological and sociological articles reviewed almost exclusively report studies on the people-place relation (e.g., Lewicka, 2010; Casakin et al., 2015, Bonaiuto et al., 2003; Anton and Lawrence, 2014; Jorgensen and Stedman, 2006). Studies which focus on relationships between people, such as social behavior, in different types of urban settlements, have been considered less valuable as references to the research presented here (see for example Bernardo and Palma-Oliviera, 2016, for a summary of literature related to the 'social identity approach').

In my papers, two different levels of place are studied: the city scale and the neighborhood scale. Researchers within urban and regional planning, geography, and economics, commonly study metropolitan regions, cities or municipalities. The community or city scale is also quite often used in literature on, e.g., city branding and urban design. Research within psychology and sociology has instead focused on the neighborhood, probably due to the assumption that the people-place relation is strongest at this scale of place (Lewicka, 2010; Hernández et al., 2007; Devine-Wright, 2013). Researchers within these disciplines (psychology and sociology) have also studied the effect of place scale on the people-place bond (Hidalgo and Hernandez, 2001; Hernandez et al., 2007; Lewicka, 2010; Jorgensen and Stedman, 2011; Casakin et al., 2015). Still, this literature is limited both regarding the number of studies and regarding their empirical support. Furthermore, few allow for comparisons between different neighborhoods within the same city.

The final paper of this thesis primarily draws upon literature within environmental psychology and sociology. There are also some references made to geographic studies. Few studies in economics or urban design seem to focus on neighborhood distinctiveness.

## 4. Summary of Papers

The summary of the four papers is structured in line with the literature overview. In the first section, the two energy-related papers are summarized, followed by conclusions and a discussion. In the second section, the two social-related papers are summarized, followed by conclusions and a discussion.

### 4.1 Energy Consumption and Price Premium on Green Housing (paper no. 1 and 2)

#### 4.1.1 Paper no. 1: *Residential energy consumption and conservation.* Wahlström, M.H. and Hårsman, B. (2015)

As one of several steps taken to reduce the use of energy and the emission of climate gases, Sweden adopted a law on energy performance certification (EPC) of buildings in 2006. The law, which is based upon European Union directives, prescribes that almost all buildings must have energy performance certificates issued by approved experts from 2009. Single-family housing owners are obliged to have the prescribed certificate no later than at the time of selling the house.

The Swedish EPCs for single-family housing provide valuable information on energy consumption and various physical attributes. They also include estimates of the energy conservation potentials resulting from implementing cost-efficient energy saving measures. By matching the certificates issued for single-family houses in 2009 and 2010, with socioeconomic data about residents, local climate data and information about recent improvements of the building, a unique database has been created. The database holds information on approximately 77,000 houses, described by over 200 variables. One aim of the paper is to assess the role, for energy consumption, played by household characteristics as compared to physical attributes of the house. Another is to estimate the influence of housing attributes and climate on the conservation potentials. The analytical framework described in figure 2 is used to explore the energy consumption and the energy conservation potential in single-family homes in Sweden.

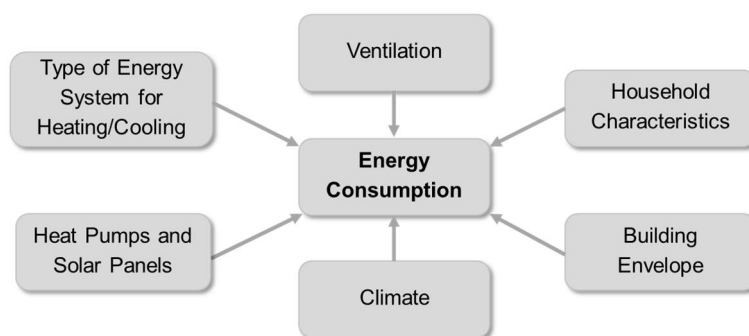


Figure 2. Conceptual outline of categories of variables influencing energy consumption.

As shown by figure 2, the energy consumption is related to the type or types of energy purchased, the heating/cooling system, and the availability of heat pumps or solar panels. Assuming that any household aspires a certain level of indoor comfort, important explanatory roles are also played by the ventilation system, the thermal quality of the building envelope and the local climate. The demanded indoor comfort presumably depends upon household characteristics such as family type, size, and income.

Regression analysis is used to address and analyze the following questions:

- What role do different household characteristics play for the energy consumption, as compared with housing attributes and the climate?
- How do the energy conservation potentials suggested by the EPC experts depend upon the housing attributes, the energy consumption, and the local climate?
- To what extent are the experts' energy conservation assessments consistent with the estimated relationship between energy consumption and different explanatory factors? This question relates to a wider one about the quality of expert assessments. Though not a primary aim of this paper, the indicated regressions will shed light on some quality-related aspects.

In line with earlier findings, the results show that household characteristics such as family size and age of the householder have a significant influence on the energy use and hence should be included in any study trying to explain the variance of energy consumption among single-family houses. The results also show that while the quantitative impact of physical attributes are much more important than the socioeconomic characteristics when it comes to the energy use for heating and cooling, it is the other way around when considering the energy use for lightening and appliances.

The results further demonstrate that houses equipped with heat pumps consume considerably less energy. When compared with identical houses using a combination of oil-fired boiler and electricity, the energy consumption for heating and cooling is almost 60% lower. The outdoor temperature is, of course, another significant factor.

Through the EPC database, a rather substantial energy-savings potential is identified; the average assessed conservation potential corresponds to 15% of the total energy yearly used by the average house. Considering that the assessments are based upon cost-efficient energy saving measures, this conservation potential seems rather impressive. Using regression analysis, our results show that about 49% of the variance in assessed savings can be explained by the energy consumption, the housing attributes and the local outdoor temperature. The analysis of the conservation potentials also shows that the assessments differ across counties in a way that might indicate a lack of inter-rater reliability among the certification experts.<sup>7</sup>

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<sup>7</sup> This conjecture has later been substantiated by Hårsman et al. (2016).

#### 4.1.2 Paper no. 2: *Doing good but not that well? A dilemma for energy conserving homeowners.* Wahlström, M.H. (2016)

The purpose of the paper is to analyze if there is a price premium for energy-efficient housing in Sweden. The underlying assumption is that knowledge regarding how the energy performance of a house influences its price is important for policy makers and residents that want to reduce the energy consumption. The analysis is mainly based on the same dataset as the one described in paper no. one. By matching, data have been added concerning the price of housing and variables supposed to influence the price. Examples of price-influencing variables are plot area and municipal income tax rate. A novelty in comparison to earlier studies is that the energy performance is decomposed into energy consumption and several other variables characterizing the energy system.

Figure 3 shows the theoretical model used to analyze the relationships between the market price of a house and different explanatory factors. The attributes included when buying the house are divided into those providing direct consumer satisfaction, like the living space and view, and those, like the heating system, which in combination with energy produces the indoor comfort enjoyed in final consumption. As illustrated in figure 3, the indoor comfort is also influenced by the thermal quality of the building envelope and the local climate. The attributes providing direct consumer satisfaction are either related to the building or its neighborhood and location.

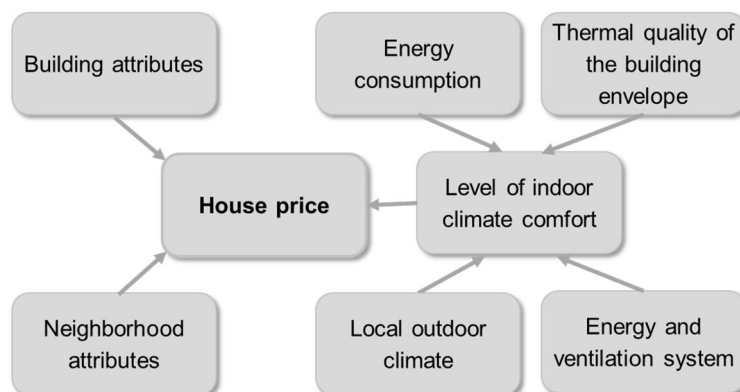


Figure 3. Building and neighborhood attributes influencing the market price of a house

The outlined relationship between the selling price of a house, its energy performance, and various characteristics of the building and its neighborhood is analyzed using a hedonic model. Specifically, the following questions are addressed:

- Is the market price for single-family homes higher the lower the anticipated energy consumption? I.e., is there a price premium on energy efficiency?
- Is the price also influenced by other attributes characterizing the energy system of the house?

- Is the price influenced by the expert assessments of their conservation potentials?

Whether using all observations or subsets defined by year of construction, region or type of energy system, the results do not support earlier findings of a price premium for energy efficient housing. On the contrary, the results indicate that energy consumption has a positive impact on the transaction price. However, the results also indicate a significant willingness to pay for several housing attributes that reduce the energy consumption. By way of example, in comparison with a house relying on electricity only for heating and cooling, a house having a ground-sourced heat pump generates a price premium of 18%.

It is difficult to explain the seemingly contradictory results, but one reason might be that the energy consumption variable in this study, as well as in earlier ones referred to, is related to the seller. This corresponds to assuming that the buyer expects to use the same quantity of energy as the seller which is a quite strong assumption since a specific buyer may have good reasons for expecting to use more as well as less energy than the seller. The paper sheds some light on this issue utilizing the data on energy conservation potentials provided by the EPC-assessors. It is done by using the difference between the seller's energy consumption and the conservation potential as an indicator of the energy use expected by the buyer. Though somewhat weaker, this indicator or proxy variable for energy consumption is also positively related to the transaction price. The results also confirm that the characteristics of the energy system remain important for the selling price.

Another and related reason might be that the buyers attach more importance to various physical attributes of the house and its energy system than to the energy use of the seller. The signaling effect related to physical attributes might, in turn, be explained by the fact that EPCs for single-family houses were introduced in Sweden in 2009. Hence, it seems likely that most buyers in 2009 and 2010 preferred to base their expected energy use on what they could observe by visiting the house rather than on a number in the EPC.

#### 4.1.3 Discussion and Conclusions

A basic idea behind the performance certificates is of course that the information about energy usage, energy-related physical attributes and expert advice on energy conservation should make the households more aware of their energy consumption and, hopefully, take measures to reduce it. Since the residential sector accounts for such a large fraction of the overall final energy use – 21% in Sweden and 26% for 27 EU-countries (Mata et al., 2013) – it seems clear that even small reductions would be useful. It also seems clear that a price premium on green housing indicates a preference among households to reduce their use of energy. Thus, it is probably correct to suggest that, in the long run, the price premium will contribute to a more sustainable city.

Households moving to new dwellings usually have less knowledge about the energy standard than the sellers or renters. Therefore, one would expect the information provided by the energy performance certificates (EPCs) to result in reductions of the energy consumption. However, as exemplified by, e.g., Kjaerby (2009) that does not seem to be the case. Notwithstanding the efforts and legislations from the EU, energy efficiency neither appears to be a key factor when bidding on a single-family home in Sweden. The most important feature influencing the house price continues to be the location (in terms of, e.g., proximity

to shoreline, prosperity of the parish and municipal tax level). The top-down approach used when implementing the EPCs does not seem to have had the envisaged effect on energy consumption. A more fruitful approach would probably be bottom-up, i.e., adapted to individual needs. By way of example, a relatively simple and efficient way to reduce the energy use in the residential sector would be to support increased use of heat pumps.

Several policy conclusions can be drawn from the results. One is that the government agency responsible for the EPCs should take further steps to improve their quality. Each certificate should be checked concerning consistency between the different data items included, and they should be compared concerning inter-rater reliability among experts. Since the socioeconomic characteristics of the residents play a significant role, the responsible agency should also consider adding some information about the households on future certificates. The responsible government agencies should furthermore also take measures to facilitate production of databases of the kind used in this paper by for example initiating closer cooperation between agencies responsible for the EPC-system and Central Bureaus of Statistics.

The current usefulness of EPCs as a tool to reduce energy consumption can be questioned. A possible additional explanation is that most of the information accessible through the EPC is also available to the buyer by simply visiting the house put out for sale. The only information uniquely provided by the EPC is the seller's energy consumption and the energy-saving measures suggested by the assessors, and neither of them gives rise to a price premium. A likely reason is the lack of information regarding the buying households' expected energy consumption. With knowledge about their expectations, the analysis of the price premium would become much more reliable. This information might perhaps be obtained through interviews with a sample of buying households. By means of a survey, the EPC data could also be complemented with information about the buyers' energy consumption after moving to the house as well as of their attitudes and opinions concerning energy and the environment. Doing so, it would also be interesting to include variables making it possible to shed more light on the importance of non-monetary valuation of a 'greener' living versus the monetary savings related to energy efficiency. Such a survey would facilitate further analysis of how the house price is influenced by the households' attitudes and behavior regarding energy use.

More generally, this paper indicates the possibility to gain new knowledge about residential energy use and conservation by combining data from energy performance certificates with data from other sources. The current database can also be used to look closer at the indicated quality problems related to inter-rater reliability. By adding certificates from later years than those included here more could be found out about the robustness of the findings. By now, the Swedish National Board of Housing, Building, and Planning have eight years of EPC data accumulated. Hence, it would be possible to perform a longitudinal study, which would enable analysis of how the relationship between the house price and the energy system/performance change over time. It would also be possible to analyze to what extent the advice on energy saving measures have been implemented, and the assessed conservation potentials realized.

Future research would perhaps benefit from incorporating information about the buildings' energy classification, which since 2014 is included in the EPC summary. This would make it

easier to compare the findings with the European research regarding price premium on energy efficiency.

As most EU-countries have similar EPCs for housing, the study should be interesting also outside Sweden. However, the Swedish case differs from other European countries in several ways. Compared to countries further south, Sweden is, for example, colder with fewer sun hours, which influences the type of energy used in the residential sector. The fraction of houses using solar energy is for instance only 0.7 percent according to the database used here.

The papers add to earlier studies in several ways. First of all, the matched database makes it possible to distinguish between the impacts caused by energy consumption and different components characterizing the energy system, such as heat pumps, rather than relating the price impact to a green label or an energy performance rating. This decomposition is also important since the buyer of a home might expect to consume more as well as less energy than the seller without changing its energy system – implying that the transaction price might be related to the expected rather than the observed energy consumption. To use the difference between the observed energy consumption and the conservation potential, as a proxy variable for the expected energy consumption when testing its relation to the house price, is another contribution.

Furthermore, the large and in many respects unique database is considered a contribution to the earlier literature in this field of research. It provides a far richer description of the energy system and other attributes characterizing a house than previous studies and offers great opportunities to analyze the relationship between sales price and energy consumption for subsets of homes having common characteristics.

## **4.2 The identity/soul of the city and its neighborhoods (paper no. 3 and 4)**

### **4.2.1 Paper no. 3: What about the Soul of the City? Applying a Resident Perspective in four Swedish Cities. Wahlström, M.H. (2017)**

This paper explores cities' distinguishing features through the concept city soul. The aim 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 opinions of the physical and functional city characteristics. Specifically, the aim is to analyze to what extent the residents' assessment of the strength of the city soul depend upon their opinions regarding various city characteristics and relational aspects. Figure 4 shows the residents' perceptions of the city soul as a function of two main components; their relation to the city as well as their perceptions of its characteristics, and it includes an assumed link from the city characteristics to the city relation.

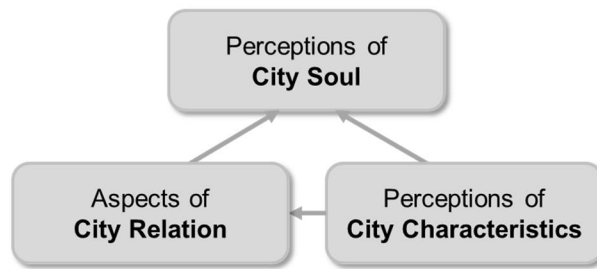


Figure 4. Illustration of the conceptual city soul model.

The conceptual framework is explored and tested through 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.<sup>8</sup> The empirical analyses are based on over 2,500 complete observations and a combination of factor and regression analysis. The questionnaire presents 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 where it is nice to spend time” (physical and emotional). Aiming 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. All statements are evaluated using a nine-point Likert scale, where 1 means ‘I don’t agree at all’ and 9 means ‘I totally agree’. 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.

Overall, the survey results support the model framework, linking aspects of the residents’ relation to their city and their perceptions of its physical and functional characteristics to their assessment of the city’s soul. The characteristics are plentiful, but by way of example, they refer to the natural and built environment, as well as public and commercial services.

The results indicate that the residents’ relation to their city is more important than the perceptions of city characteristics for their assessment of the city soul. Specifically, the strength of the city soul appears to be linked to feelings of pride, attachment, and belonging. The results regarding the influence of city characteristics suggest that residents’ perceptions of ‘Visible art’, ‘Beautiful city’, and ‘A story I’d like to tell’ are related to the strength of the city soul.

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<sup>8</sup> Further information about the survey can be supplied by the author upon request.



#### 4.2.2 Paper no. 4: *The Soul of Urban Neighborhoods and its Relation to the City Soul*. Wahlström, M.H. (forthcoming)

Applying the city soul framework (see the summary of paper no. three above for an explanation of the framework) on neighborhoods, the overall aim of this study is to compare the residents' perceptions of their city's and neighborhood's soul, to identify potential similarities and differences between these two scales of place. Figure 5 presents the city soul model slightly adjusted to fit the neighborhood perspective.

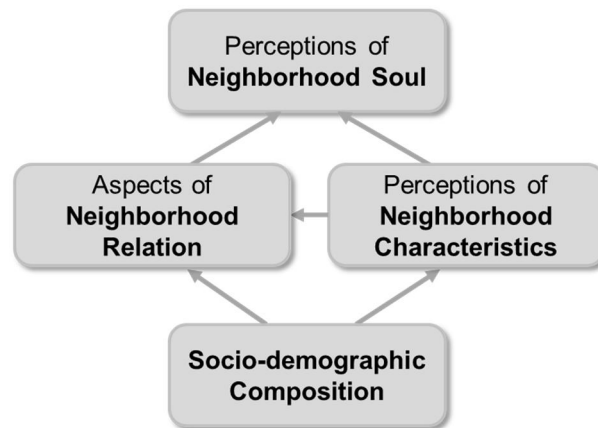


Figure 5. Illustration of conceptual model, applied on the neighborhood level

According to the conceptual model, the perception of the neighborhood soul is influenced by different relational aspects and neighborhood characteristics. The characteristics also influence the neighborhood soul indirectly, via the residents' relation to their neighborhood. The socio-demographic composition of the neighborhood is assumed to influence both the ratings of relational aspects and characteristics.

This study utilizes data from a quantitative survey of 6,600 residents (2,573 respondents) in four Swedish cities. Specifically, 1,300 respondents living in Stockholm (capital of Sweden) will be used to analyze the strength of the city soul vis-à-vis the soul of neighborhoods.

The results show that both the city and neighborhood soul are significantly related to the corresponding people-place relations as well as to the perceptions of physical and functional characteristics. Regardless of spatial scale, the residents' assessment of the soul seems to be stronger influenced by the people-place relation than by their perception of the characteristics (though the characteristics' influence is both direct and indirect, via the relation). In particular, the relative importance of the relation is observed for residents that were born in the city or moved there a long time ago. The characteristics with the strongest link to the soul of the neighborhood are very similar to the ones linked to the city soul: 'Beautiful buildings', 'Statues and symbols', and 'A story I'd like to tell'.

The neighborhood-specific analyses show that Stockholm's districts differ in several respects – differences that are not equalized by controlling for the district-specific socio-demographic mix – which should be especially interesting from a practical planning perspective. If a district ranks substantially lower than others regarding, for example, 'Nice routes for

cycling/walking' or 'Visible art in open places' it provides the planners with a strong signal to look closer into the corresponding issues.

### 4.2.3 Discussion and Conclusions

The results presented in this thesis indicate that the perceived strength of the city soul is influenced by the residents' relation to their city and by the perceptions they have of different characteristics of the city. The physical and functional attributes are essential as they seem to influence the perceived strength of the city and neighborhood soul, both directly and indirectly via the residents' relation to the place. With time, the relation grows stronger and increasingly influential. Positive perceptions, in terms of beauty, statues, and art, as well as feelings of pride, satisfaction, and belonging are significantly linked to perceptions and strength of the city soul. The same is concluded for the neighborhood soul. The importance of arts and symbols in the city and neighborhood supports earlier studies indicating that culture, arts, and experiences are highly valued by inhabitants (e.g., Olsson, 2003) and contribute to the attractiveness of urban places (e.g., Mellander et al., 2011b).

Since several disciplines have studied the distinguishing features of places, the denominations, definitions, and interpretations differ, depending on the research area. The concept I have used; the 'soul' of a place, has also proven to be difficult to conceptualize, operationalize and assess. Yet, the research presented here shows that the 'soul' seems both intuitively understood by and important to the residents. Therefore, it should be considered valuable for planners to achieve a better understanding of it (the same line of reasoning is presented by, e.g., Landry and Murray, 2017).

One of the greatest difficulties with this second topic of my thesis is that on the one hand, the 'soul' appears to be both tangible and intuitively easy to understand, while on the other hand utterly elusive, vague and subjective. Similar difficulties regarding dealing with the soul of a city were in fact acknowledged by Ford Hueffer already at the beginning of the 20th century, in his work "The Soul of London - A Survey of a Modern City.":

*"And, with its "atmosphere" whatever it is, with its "character" whatever it may be, with the odd touches that go to make up familiarity and the home-feeling, the shape of its policemen's helmets, the cachet of its shop fronts, effects of light cast by street lamps on the fog, on house fronts, on front garden trees, on park railings, all these little things going towards its atmosphere and character, that jumping-off place will remain for him, as it were, a glass through which he will afterwards view, a standard by which he will afterwards measure, the London that yet remains no one's."* (Hueffer, 1905, p. 4)

In line with my ambivalence regarding using the notion 'soul', Hueffer expresses some agony about using 'soul' to describe the phenomenon he is studying:

*"I should like, if it can be done unobtrusively, to disarm criticism of the title of this book. It appears pretentious; it appears "soul-ful", it does little to indicate the scope of the book. But alas! If the critic will read the Table of Contents, and will then think for a minute or so of what one word will describe this whole hotchpotch, he will, whilst condemning, drop something like a tear for one who has been trying to find a better title, not for a minute or so, but for many months."* (Hueffer, 1905, p. xvi)

Traditionally, it has been common to compare large cities to forceful machines, engines for the national economy and development. However, the machine metaphor has since long become outdated. In the knowledge society metaphors from life sciences are more adequate and the city is more often described as a human body than as a machine (Hårsman et al., 2000). A striking example is provided by Ackroyd (2012) in his book about London with the title “London. The Concise Biography”. In the introduction he writes “...we must regard it [London] as a human shape with its own laws of life and growth. Here, then, is its biography.” (Ackroyd, 2012, p. 2)

Using ‘body’ as a metaphor for the physical and functional characteristics of the city, and ‘mind’ as a metaphor for the soul of the city, the old Latin phrase “Mens sana in corpore sano” seems surprisingly relevant. Applied to the city, “a healthy mind in a healthy body”<sup>9</sup> would mean that to have high-quality physical and functional characteristics is a necessary, but not a sufficient, condition for a city to have a positive and strong soul. The soul in this sense is what makes people perceive one city differently than another, even if their ‘bodies’ are more or less identical.

Having all caveats in mind, it should be possible to use the results presented here, 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 vital components of a strong city soul and potentially influence the residents’ relation to the city. Due to the observed differences 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 (Not In My BackYard) phenomenon.

According to, e.g., Stedman (2002) the residents’ relation to their neighborhood also influences their behavior regarding, for example, commitment to area improvements/changes. Thus, it seems fair to assume that improved understanding of how residents’ perceptions of different neighborhood characteristics influence their relation to the neighborhood, might also improve the chances for successful implementation of local plans. As the people-place relation appears to play such an important role, it may be valuable for planners to collaborate more with urban sociologists and environmental psychologists (see, e.g., Landry and Murray, 2017).

One contribution of the presented papers is the proposed methodology for linking sociological-psychological and economic-physical factors to explore an overriding concept like the city soul. The suggested conceptual model adds to the mainly psychological literature on attachment and urban design/planning literature on identity, where only a few studies seem to be theory-driven. The empirical results contribute by providing a further understanding of the complex way in which different factors influence the city soul as perceived by its residents. Finally, the paper suggests a methodology that aims at explaining and analyzing the soul of cities and neighborhoods in a systematic, quantitative manner,

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<sup>9</sup> See for example the Oxford Reference: [www.oxfordreference.com](http://www.oxfordreference.com) and MacAuley, D. (1994) A history of physical activity, health and medicine. *Journal of the Royal Society of Medicine*. 1994 Jan; 87(1): 32–35.

which might make the methodology applicable in economics, geography as well as in urban and regional planning.

The aim to find common denominators of the soul of different cities and neighborhoods, respectively, could be considered complicated when the soul is interpreted as the distinguishing features of a place. In-depth interviews with residents could be a benefit for future research as a complement to quantitative analysis of the city soul – and its more and less unique features. Such a complement would also be valuable to the analysis of the neighborhood soul.

Another recommendation for future research is to combine the stated preferences obtained through a residential survey with information on for example house prices, commercial services, the quantity of visible art and statues, or other relevant data if such can be obtained. Such a complement would constitute an interesting comparison to the results presented here. Another way to reach further and deeper knowledge about the soul of cities and neighborhoods would be to apply anthropological or ethnographical methods.

Future researchers will probably also find it useful to have more information about the residents, regarding life style, social relations, etc. when studying the soul of cities and neighborhoods. In line with, e.g., Permentier et al., 2010, and Bonaiuto et al., 1999, these factors appear to influence the perception of places in general and of neighborhoods in particular. That type of information was excluded in the survey presented here mainly based on an aim to keep the questionnaire short. As has been discussed in several studies (e.g., Hutton, 2015; Van Loon et al., 2012; Olsson, 2003), the history and cultural heritage of the city is likely to be another important feature of the city's and neighborhood's attractiveness. History and cultural heritage have played a limited role in my survey<sup>10</sup>, and it would, therefore, be interesting to analyze ahead. Furthermore, the regression analyses would possibly benefit from complementary structural equation modeling or path analysis. A final suggestion for further research is to apply the model design used here on other target groups, such as visitors and businesses.

## 5. Overall Discussion and Concluding Remarks

The challenges facing urban planning ahead are extensive. This thesis merely touches upon some aspects of two of them: the improvement of city livability and sustainability. However, sustainability is so much more than 'green' housing, and 'green' housing far more than energy-efficiency in single-family housing. Similarly, livability goes beyond cities' distinctiveness, which encompasses more than the soul of the city and its neighborhoods. By way of example, urban and regional planners will increasingly have to deal with problems due to segregation, crime, pollution, extreme weather, homelessness, outdated infrastructure, etc. See, for example, Kahn (2010), Solomon (2003), Hall (2014), and

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10 By way of example, the emphasis in the questionnaire (regarding the characteristics) was on 'symbolic' instead of 'historical' buildings. In addition to the relational aspects and characteristics, a third component was covered by the survey; so called associations – based on short descriptions of features that can be associated with a city. Among the total number of 30+ associations, 'historical', 'authentic' and 'cultural' were included. However, as initial analysis shows that the associations' relationship with city soul is rather weak, they have not been further analyzed in the research presented here.

McCormick (2017) for studies on how cities and those planning them are affected by future challenges.

In addition to global climate change and continuing urbanization, there are other extensive societal changes that should be acknowledged. One is the digital evolution triggering planners to adapt to rapid technological development throughout the society; another is increased migration due to poverty, and terrorism/war. Neither of which is discussed within the scope of this thesis.

The research presented here underlines the importance of a 'bottom-up' approach, much because the individual perspective still needs to be furthered in urban planning. Indeed, the role of people in planning has been discussed at least since the 70s, and today the participation of residents in the planning process is often taken for granted in Sweden as well as in many other democratic countries. In fact, 'a good planning for all' seems to be a goal most people would not oppose. However, in practice planners are often facing conflicting claims regarding the goals of planning. Given the cultural and socioeconomic diversity of many cities and regions, planning must deal with different wants and needs. As a consequence, justice in planning is heavily debated. See for example Albrechts (2013) and Campbell (2006) who present different suggestions for how to accomplish a more just planning.

The bottom-up approach in this thesis relies on quantitative research methodology, which often is better at assessing averages for large groups of surveyed objects, than at providing in-depth insight to specific subgroups, even though the latter perhaps could give more operational results. Therefore, future research would benefit from digging further into such subsets to find out more about the differences between them. Both aspects studied here would probably be strengthened by complementary qualitative approaches, to achieve a more in-depth understanding of the driving forces behind people's opinions and preferences regarding energy-efficiency and city soul. However, a draw-back of qualitative methods is that it more often than not is impossible to generalize the results to larger groups.

Another suggestion for future research is to include climate (e.g., outdoor temperature) as a variable in studies on city soul. Climate could work as a mediator for intangibles such as light and lifestyle, which are part of many residents' description of their city's soul according to the research presented here (see also Knez, 2005). The residents' low rating of 'Supply of sustainable/green housing' (see table 2, paper 4) underlines the importance to include climate aspects in discussions about livability. Furthermore, it provides an example of the interdependence between urban livability and sustainability.

The research presented in this thesis contributes to related literature in several ways. It supports earlier studies showing that energy-efficient housing and a strong identity/soul are aspects of sustainable and livable cities. It provides insight to Swedish residents' preferences and opinions concerning both energy-efficient housing and the soul of the city and its neighborhoods. The results indicate a preference for sustainable housing, in terms of a significant willingness to pay for heat pumps, i.e., for attributes that reduce the energy consumption and are easily observed when visiting the house. The results further show that a strong city soul is linked to feelings of strong and positive relations to the city as well as to

positive perceptions of its physical characteristics. Similar results are found regarding the soul of the neighborhood.

The analyses demonstrate that a great deal can be achieved by using quantitative statistical methods, whether as substitute or complement to qualitative methods, to a greater extent than what is commonly done in contemporary urban planning practice. All in all, the four papers show that a citizen perspective based on carefully designed databases and appropriate analytical tools can be used to gain new insights supporting urban livability and sustainability efforts. Still, in spite of my belief in the advantages of an individual perspective, there is an important caveat. It is well-known that individuals often do not act in accordance with their stated intentions or aspirations and that they now and then tend to make irrational choices. In this perspective, Kahneman (2011) provides an extensive explanation of human rationality and irrationality. As urban planning also needs to reach beyond the life span of current residents, both a bottom-up and a top-down perspective is most probably needed.

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