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Happiness in urban environments: what we know and don't know yet

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Abstract

There is no consensus on what makes for a livable urban environment. This requires empirical assessment of the relationship between urban characteristics and the happiness of residents. We took stock of the available research findings, using the World Database of Happiness; 445 findings are considered, from 20 nations over the years 1975–2022. We considered 3 aspects of the urban environment, 1) objectively assessed characteristics, 2) subjective perception of urban characteristics and 3) satisfaction with urban characteristics. Urbanites tend to be happier in places characterized by the following *objectively* assessed features: a) access to local green/nature, b) access to cultural facilities and leisure amenities, c) access to healthcare, d) access to public goods such as access to sewage and water supply and e) access to public spaces. On the other hand, residents tend to be *less* happy the closer they live to f) shops, g) public transportation hubs and h) the city center. Subjectively *perceived* environmental characteristics that go with greater happiness are: i) amenities, j) public goods in vicinity k) playground and sport facilities, while l) perceived air pollution is negatively linked to happiness. Residents were found to be happier the more *satisfied* they are with m) connectivity and local transport, n) local recreation o) water quality and the, p) environment as-a-whole. Correlations with *objectively* assessed characteristics, with the urban environment are smaller than with *subjective perceptions* of the same and differ in direction for living close to q) shops and r) public transportation hubs. While *objective* closeness to these amenities relates negatively to happiness, *subjectively* perceived availability and satisfaction with these amenities relates positively to happiness. Most of the available findings are of a cross-sectional nature and do not inform us about cause and effect. This strand of research is still in its infancy. By lack of a sound evidence base, claims about livability of urban settings will remain a matter of subjective hunches and sales-talk.

Keywords Urban environment · Built environment · Happiness · Research synthesis

1 Introduction

Today, more than half of the world's population lives in cities and urbanization is going on (United Nations World Urbanization Prospects, 2019, Tonne et al., 2021). This requires much investment in urban development, both building new cities and re-development of existing urban areas.

Urban development involves many aims, which can conflict. One of the aims is that the urban environment be 'livable' for its inhabitants. Livability is an umbrella term for the various qualities of the environment, which seem relevant for meeting human needs (Veenhoven, 2016). This matter is also referred to as 'quality of place' and 'sustainable living' (Grabowska et al, 2021). Livable environments provide conditions in which people can flourish and how well people flourish manifests in their health and happiness (Veenhoven, 2021).

Health is a classic topic in urban development and is currently supported by a strong lobby, the WHO Healthy City Movement. Consequently, there is much research on the effects of urban design on public health (Jackson, 2003; Lowe et al., 2014; Koohsari et al., 2015; Azzopardi-Muscat et al., 2020; Mueller et al., 2020). As yet, the effects on happiness are less prominent in urban design but interest is rising. One of the reasons for this rising interest in 'happy cities' is that happiness is becoming more prominent a topic anyway in modern societies (Brdulak & Brdulak, 2017; Toger et al., 2021). Another reason is that happiness appears to foster physical health, which means that one way to 'healthy cities' is to develop 'happy cities' (Toger et al, 2021).

This rising interest in the effect of urban design on happiness has not yet resulted in the development of a solid evidence base. Consequently, we see much speculation e.g. in Samavati & Desmet, 2022. The available research on subjective wellbeing in urban environments is typically not on happiness in the sense of life-satisfaction but on related issues, such as satisfaction with the urban environment and identification with the city.

We counted the observations on aspects of subjective wellbeing (mental states deemed good (well) or bad (unwell) in the urban environment reported in this journal over the last 10 years. We found 11 reports on satisfaction with city (e.g. Lee et al., 2022). In two of these cases responses to a question on satisfaction with life in a city was labeled as 'happiness' but did not concern satisfaction with one's life-as-a-whole on which we focus in this paper. We further found 2 reports on identification with the city (e.g. McGreevy et al. 2023). Also we found more aspect of subjective wellbeing, satisfaction with physical and social environment (Nedučín et al., 2023), satisfaction with meeting the residence expectation (Pishgahi & Partovi, 2021).

Happiness in the sense of life-satisfaction was addressed 4 times. In three of these cases happiness was not linked to the urban environment but to the house where the respondent resides (Fong et al., 2021, Li et al., 2023, Zhang & Zhang, 2019) or to the effects of housing demolition (Hu et al., 2023). Only one study linked happiness to an environmental characteristic, in that case public facilities (Li et al., 2023) but this report was published after our cut-off data of 2022 and hence not included in this review. So, happiness as defined in this article (life-satisfaction) was not addressed in the Journal of Housing and Build Environment up to 2022.

Costly long-term investments in urban design require a better information basis. For that reason, we took stock of the available research findings on happiness in urban environments published elsewhere.

1.1 Questions

We sought answers to the following questions:

1. What urban conditions are most/least related to the happiness of inhabitants?
2. How universal are these correlates? Is there a difference across cultures?
3. Does measurement make a difference?
4. How strong are the correlations? How strong compared to other correlates of happiness?
5. Is there a causal effect of urban conditions on the happiness of inhabitants, or are the correlations driven by effects of happiness on choice and appreciation of where one lives?
6. If so, what are the causal mechanisms?

1.2 Approach

We explored answers to these questions in the available research literature, taking stock of the findings obtained in quantitative studies on the relationship between characteristics of the urban environment and happiness. To our knowledge, the research literature on this subject has not been reviewed as yet. Though there are reviews of the abundant research on *satisfaction with urban environments* (Michalos & Orlando, 2006; VanRens et al., 2018; Lin, 2016; Weijs-Perrée et al, 2020), there is as yet no review of the scantier research on *satisfaction with life in urban environments*.

We applied a new technique for research reviewing, that takes advantage of an online findings-archive, the World Database of Happiness (Veenhoven, 2023a, 2023b). This allows us to present the available findings in a few easy to oversee tabular schemes.

1.3 Structure of the paper

The remainder of this paper is organized as follows. In Section 2, we define the key concepts of livability and happiness and give a short account of happiness research. In Section 3, we describe the new review technique: how the available research findings were gathered and how these are presented. In Section 4, we discuss what answers the available findings have provided for our research questions. We found some answers to the first research question, but no clear answers to the other questions. In Section 5, we discuss these findings and their shortfall in particular. In Section 6 we conclude.

2 Concepts and measurement

There are different views on what constitutes 'livability' and 'happiness'. Both concepts refer to the quality of life and their meaning can therefore be clarified using Veenhoven's (2000) distinction between four qualities of life. This sorting is based on two distinctions between: 1) *chances* for a good life and *outcomes* of life and 2) qualities of the *external* living environment and *inner* qualities of the person who lives there. In combination, these two dichotomies result in four qualities of life, as presented in Figure 1. In this conceptualization, livability denotes the environmental chances for a good life

	<i>Outer Qualities</i>	<i>Inner Qualities</i>
<i>Life chances</i>	Livability of environment	Life-ability of the person
<i>Life results</i>	Usefulness of life	Satisfaction with life (happiness)

Source: Veenhoven 2000

Fig. 1 Four qualities of life

(left top quadrant) and is happiness the inner outcome of life for a person (right bottom quadrant).

2.1 Livability

2.1.1 Concept of livability

Veenhoven defined livability as the degree to which an environment fits the needs and capacities of the people who live there (Veenhoven, 2021). Thus defined, livability is essentially a relational concept, an environment that is well livable for person A, may not be livable for person B and likewise be better livable for some categories of people (e.g., youngsters) than for another kind of people (e.g., elderly). This contingency is typically ignored when the concept of livability is applied to urban design, since the aim of urban planning is to suit the average person and future generations. Still, it is worth checking the implicit assumption that needs and capacities do not differ too much across cultures and generations, as we will do in answering research question 2.

2.1.2 Measurement of livability

Though the term has an intuitive appeal, livability is not easily measured. The needs and capacities of inhabitants are hardly observable as such and neither is their fit with environmental conditions. This problem has been addressed in two ways. The most common way is to presume environmental conditions that will fit most people and next check to what extent such conditions exist in an environment. Veenhoven (2014) calls this ‘assumed livability’. A road less often taken is to infer the fit from the observed life-results, such as happiness. If people are happy in an environment, the living condition apparently fit with their needs and capacities. Veenhoven refers to this approach as ‘apparent livability’. In this paper we follow that approach and focus on how happy people live in different urban conditions.

2.1.3 Difference between expected and experienced happiness

In examining the effects of urban environments on the happiness of the people who live there, it is essential to acknowledge the difference between *anticipated* and actually *felt* happiness. In economics, this difference is known as expected versus experienced utility (Kahneman et al., 1997) and research has shown that what people expect to add to their happiness often does not work out that way. Frey and Stutzer (2014) called that ‘misprediction of utility’, which often results from misleading sales communications.

2.2 Happiness

2.2.1 Concept

Throughout history, the word happiness has been used to denote different concepts that are loosely connected. Philosophers typically used the word to denote living a 'good life' and often emphasize moral behavior. 'Happiness' has also been used to denote good living conditions and was as such another word for 'livability'.

Today, many social scientists use the word to denote subjective satisfaction with life, which is also referred to as subjective well-being (SWB). This use of the word fits the bottom right quadrant of Fig. 1. In this paper, we follow this conceptualization as it is also the focus of the World Database of Happiness (Veenhoven, 2023a, 2023b) from which the data reported in this paper are drawn. *Happiness is defined as the subjective enjoyment of one's life as a whole*; on other words: how much one likes the life one lives. A synonym is 'life-satisfaction'.

Components of happiness Our overall evaluation of life draws on two sources of information: a) how well we feel most of the time and b) to what extent we perceive to get from life what we want. Veenhoven (1984) refers to these sub-assessments as 'components' of happiness, respectively an *affective component* called 'hedonic level of effect' and a *cognitive component* called 'contentment'.

The affective component is also known as 'affect balance', which is the degree to which positive affective (PA) experiences outweigh negative affective (NA) experiences. Positive affect typically signals that we are doing well and encourages functioning in several ways (Fredrickson, 2004) and protects health (Veenhoven, 2008), while negative affect signals that there is something wrong, leading to avoidant behavior and activation of the fight or flight modus. The affective component tends to dominate in the overall evaluation of life (Kainulainen et al., 2018).

There are good reasons to assume that the affective component of happiness reflects the gratification of universal human *needs* in the first place, while the cognitive component rather denotes how well culturally relative *wants* are perceived to be realized (Veenhoven, 2009). We expand on this difference in Sect. 4.

Difference with other notions of wellbeing Happiness in the sense of the 'subjective enjoyment of one's life-as-a-whole', should not be equated with 'objective' notions of what is a good life, in particular not with 'livability' as defined above. Though happiness is an indicator of 'apparent livability' it is not the same. How happy people are in an environment depends also on their life-ability; mentally and physically strong people can be happy in poor situations. Though strongly related to happiness, mental health is not the same either; one can be pathologically happy or be happy in spite of a mental condition. Differences in wider notions of well-being are discussed in more detail in Veenhoven (2015).

2.2.2 Measurement of happiness

Since happiness is defined as something that is on our minds, it can be measured using questioning. Some common questions are given below:

- *Question on overall happiness:*
 - Taking it all together, how happy would you say you are these days?
 - How satisfied or dissatisfied are you with your life as a whole?
- *Questions on hedonic level of effect:*
 - Would you say that you are usually cheerful or dejected?
 - How is your mood today? (Repeated several days)
- *Question on contentment:*
 - 1) How important are each of these goals for you?
 - 2) How successful have you been in the pursuit of these goals?

Not all questions ever used fit the above definition of happiness equally well. A list of measures that have passed a test for face-validity is available in the Collection Measures of Happiness (Veenhoven, 2023) of the World Database of Happiness. The check for conceptual fit is explained [here](#). In this review we limit to findings on happiness obtained with such validated questions.

2.3 Happiness research

Over the ages, happiness has been a subject of philosophical speculation and in the second half of the twentieth century, it became the subject of empirical research. In the 1960's, happiness appeared as a side subject in research on successful aging (Neugarten et al., 1961) and mental health (Gurin et al., 1960). In the 1970s happiness became a topic in social indicators research (Veenhoven, 2017) and in the 1980s in medical quality of life research (e.g., Calman, 1984). Since the 2000s, happiness has become a main subject in the fields of 'Positive psychology' (Lyubomirsky et al., 2005) and 'Happiness Economics' (Bruni & Porta 2005). All this has resulted in a spectacular rise in the number of scholarly publications on happiness and in the past year (2022) some 500 new research reports have been published. To date (June 2023), the Bibliography of Happiness list 8045 reports of empirical studies in which a valid measure of happiness has been used.

2.3.1 Finding archive: the world database of happiness

This flow of research findings on happiness has grown too big to oversee, even for specialists. For this reason, a findings-archive has been established, in which quantitative outcomes are presented in a uniform format and terminology on electronic 'finding pages' each of which has an unique internet address. To date (June 2023) the archive holds some 48.000 research findings which can be filtered in various ways. This 'World Database of Happiness' is freely available on the internet at <https://worlddatabaseofhappiness.eur.nl>. Its structure is shown in Fig. 2. A recent description of this novel technique for the accumulation of research findings can be found in Veenhoven et al. (2022).

To date (June 2023), the World Database of Happiness contains some 23000 correlational findings (Veenhoven, 2023) which are sorted into a fine-grained subject classification. One of the subject categories is Happiness and Build environment, which currently holds 410 findings. We draw on that source for this paper.



Fig. 2 Start page of the world database of happiness

3 Method

The first step in this review was to gather the available quantitative research findings on the relationship between happiness and urban environment. The second step was to present these findings in an uncomplicated form.

3.1 Gathering of research findings

In order to identify relevant papers for this synthesis, we inspected which publications on the subject of urban settings were already included in the Bibliography of World Database of Happiness, in the subject sections Build environment and Local setting. Then, to further complete the collection of scientific publications on happiness in urban environments, we searched in Google Scholar, using the terms 'happiness', 'life satisfaction', 'subjective well-being', 'well-being', 'daily affect', 'positive affect', 'negative affect' in connection with the terms 'urban' and 'building'. Publications had to report an empirical study on happiness in the sense of life satisfaction (cf. Section 2.1). We excluded publications on related matters, such as mental health or wider notions of 'flourishing'. Together this yielded 84 publications which were all entered in the Bibliography of Happiness. As a next step, we selected studies reported in these publications that had used a valid measure of happiness

(cf. Section 2.2). We excluded scales that involved questions on different matters, such as the much-used Satisfaction with Life Scale (Diener et al., 1985). 3) The study results had to be expressed using some type of quantitative analysis. 4) A report on the study should be available in English, French, German, Persian, or Spanish. We searched studies published up to and including the year 2022.

3.2 Studies found

Together, we found 55 reports of an empirical investigation that had examined the relationship between characteristics of the urban environment and the happiness of people who live there. Of these 46 were reported in a journal article, 3 in books, 3 in a master thesis, 1 in a PhD thesis and 2 in a working paper. The reports have been published between 1969 and 2022. Most of the journal articles were published in *Applied Research in Quality of Life*, *Urban Affairs Review*, *Economics Research Journal*, *International Journal of Happiness and Development*, *Social Indicators Research* and *Human Relations*. These 55 studies which together yielded 68 findings.

3.2.1 People investigated

Together, the studies covered 3,421,884 respondents and 20 different countries, developed countries as well as developing countries. Studied cities are, Montevideo (Uruguay), Ghent and suburbs (Belgium), the Randstad (a conurbation including Amsterdam, Rotterdam and The Hague and Utrecht in the Netherlands), Greater London (UK), Paris and suburbs (France) and Budapest and suburbs (Hungary), Berlin (Germany) Oklahoma, Ohio, Texas and New York (USA), British Columbia, Edmonton, Delhi (India), Toronto (Canada), Ho Chi Minh city (Vietnam), Beijing, Wuhan, and Hangzhou city (China), Gyeonggi-do region (South Korea) and Tokyo (Japan) Kuopio (Finland).

3.2.2 Research methods used

Almost all the studies were cross-sectional. We found only one longitudinal study and not any experimental study on this subject. An overview of all the included studies, including information about population and methods is given in Table 1.

3.3 Format of this research synthesis

As announced, we applied a new technique of research reviewing, taking advantage of two technical innovations: a) the availability of an on-line findings-archive, the World Database of Happiness (cf. Section 2.3) and b) the change in academic publishing from print on paper to electronic text read on screen, in which links to that online information can be inserted.

3.3.1 Links to online detail

In this review, we summarized the observed statistical relationships using +, – or 0 signs. These signs link to finding pages in the World Database of Happiness, which serves as an online appendix in this article. If you click on a sign, a finding page will

Table 1 55 Studies in which the relationship between urban environment characteristics and happiness was examined

People Place, Time N	Measure of Urban Environment Characteristics	Measure(s) of Happiness	Source
15+ aged, general public, Australia, 2001 – 2013 N = 6082	<ul style="list-style-type: none"> - Local nature - Build environment 	Life Satisfaction	Ambrey (2016)
18+ aged, general public, USA, May 1972 N = 1297	<ul style="list-style-type: none"> - Satisfaction with leisure activities - Satisfaction with time for leisure - Satisfaction with housing - Attitude to neighbourhood - Satisfaction with local shops - Satisfaction with local recreation - Attitude to local natural environment - Satisfaction with local transport - Public transport in the vicinity - Transport facilities in the vicinity 	Life3 (G3)	Andrews and Withey (1976)
General public 67 neighbourhoods Rotterdam Netherlands 2009 N = 67	<ul style="list-style-type: none"> - Availability of amenities in vicinity - Sports facilities in vicinity - Schools in vicinity - Child care in vicinity - Cultural facilities in vicinity - Amenities in vicinity - Local nature - Use of local amenities - Satisfaction with local environment - Satisfaction with local environment - Attitudes to local environment 	Overall Happiness in Life (O-HL)	Auma (2015)
16–75 aged, general public, City of Rotterdam, The Netherlands, 2007 N = 4420	<ul style="list-style-type: none"> - Availability of amenities in vicinity - Sports facilities in vicinity - Schools in vicinity - Child care in vicinity - Cultural facilities in vicinity - Amenities in vicinity - Local nature - Use of local amenities - Satisfaction with local environment - Satisfaction with local environment - Attitudes to local environment 	Overall happiness	Aussen et al. (2008)
23–59 aged English speaking, Toronto and Ontario, Canada, 198? N = 1038	<ul style="list-style-type: none"> - Satisfaction with local environment - Attitudes to local environment 	Satisfaction with life as a whole	Austrom (1984)
Students, Moscow and Glazov (Ural), Russia, 1990 N = 116	<ul style="list-style-type: none"> - Satisfaction with local transport 	Delighted-Terrible life	Balatsky and Diener (1993)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
Low-income urban households, Delhi, India, 2016 N = 1278	- Sewage in vicinity	Life satisfaction	Bandyopadhyay (2020)
18+ aged Netherlands, 1977–2006 N = 54,299	- Current livability of local environment	Overall: Happy Person (O-HP)	Boelhouwer (2010)
65+ aged Britain, 2000–2001 N = 999	- Local environmental quality - Current livability of local environment	Overall: Good-Bad Balance (O-GBB)	Bowling and Gabriel (2004)
18+ aged metropolitan areas in 5 OECD nations, 2011 N = 1964	- Diversity of land use in vicinity - Local green - Distance from city centre - Population density in vicinity - Compactness of city centre - Local traffic density	Overall satisfaction in Life as a Whole (O-SLW)	Brown et al. (2015)
18+ aged general public, West Virginia USA, 2003 N = 2000	- Satisfaction with neighbourhood - Availability of amenities in vicinity	Quality of life	Bukenya et al. (2003)
18+ aged, general public, Wisconsin, USA, 1974 N = 548	- Satisfaction with neatness of local streets - Satisfaction with medical services in vicinity - Satisfaction with local shops - Satisfaction with local recreation - Satisfaction with local environment - Satisfaction with leisure activities - Attitude to local natural environment - Satisfaction with local schools - Satisfaction with school facilities	Satisfaction with life as a whole	Buttel et al. (1977)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
12–16 aged, secondary schools' pupils, Catalunya, Spain, 1999 N = 968	- Satisfaction with local schools	Overall life satisfaction	Casas et al. (2005)
Employees, Italy, 2004 N = 1240	- Cultural facilities in vicinity	Happiness	Di Giacinto et al. (2007)
18+ aged Montevideo, Uruguay, 2006 N = 801	- Distance from city center - Perceived neatness of vicinity - Perceived air pollution in vicinity - Water supply in vicinity - Sewage in vicinity/ Drainage in vicinity - Satisfaction with local transport - Satisfaction with local greenery - Satisfaction with local recreation - Street lights in vicinity - Local green - Street maintenance in vicinity	Overall Happiness in Life (O-HL)	Ferre et al. (2010)
15+ aged, general public, New Zealand, 2008 – 2012 N = 22,727	- Attitudes to quality of local environment - Satisfaction with amenities in vicinity - Satisfaction with local services - Public goods and services in vicinity - Satisfaction with local transport - Satisfaction with local recreation - Attitude to local natural environment - Satisfaction with local environment	Life satisfaction	Fleming et al. (2016)
Adults, aged > = 20, Thailand N = 5360	- Sports facilities in vicinity	happiness	Gray et al. (2008)
16+ aged, general public UK, 2012 N = 31,946		Life satisfaction	Gschwandtner et al. (2016)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Characteristics	Measure(s) of Happiness	Source
18+ aged Urban areas, European countries, 2014 N = 5205	<ul style="list-style-type: none"> - Local traffic safety - Street maintenance in vicinity - Availability of amenities in vicinity - Availability of amenities in vicinity - Shops in vicinity - Local green - Perceived air pollution in vicinity - Perceived neatness of vicinity - Satisfaction with leisure activities - Satisfaction with local environment - Satisfaction with housing 	Overall Happiness	Hart et al. (2018)
Adults, general public, Australia, 1978 N = 679	<ul style="list-style-type: none"> - Amenities in vicinity - Availability of amenities in vicinity - Satisfaction with social contacts in vicinity 	Life-as-a-whole index	Headley (1981)
25–85 aged 5 big cities, western nations 2007 N = 5000	<ul style="list-style-type: none"> - Sports facilities in vicinity 	Overall Happiness in Life (O-HL)	Hogan et al. (2016)
18+ aged, general public, United States of America, 2005–2009 N = 1,589,266	<ul style="list-style-type: none"> - Satisfaction with medical services in vicinity - Satisfaction with health-services - Satisfaction with local shops - Attitude to local natural environment - Satisfaction with housing - Satisfaction with local transport - Satisfaction with local recreation - Satisfaction with school-facilities - Commuting time - Remoteness 	life satisfaction	Huang and Humphreys (2012)
White collar workers, living in company towns, Columbia Canada, 1969 N = 470		Satisfaction with life in general	Hulin (1969)
Inhabitants More and less planned areas, Ho Chi Minh city, Vietnam, 2013 N = 1055		Overall: Satisfaction With Life	Huynh and Peiser (2016)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
Working aged (20–69), China, 2003–2008 N = 1798	<ul style="list-style-type: none"> - Satisfaction with natural environment - Satisfaction with neighbours - Satisfaction with leisure - Satisfaction with housing - Health care in vicinity 	Enjoyment	Inoguchi and Fujii (2013)
16+ aged general public, Germany, 1998–2012 N = 219,872	<ul style="list-style-type: none"> - Health care in vicinity 	Quality of life (Lebensqualität)	Jantsch et al. (2016)
18+ aged, general public, City of Edmon- ton, Canada, 1977–1984 N = 3430	<ul style="list-style-type: none"> - Satisfaction with local environment - Satisfaction with leisure activities 	Life satisfaction	Kennedy and Mehra (1985)
Adults, general public, Poland, 2007 N = 1000	<ul style="list-style-type: none"> - Satisfaction with housing - Satisfaction with local environment 	Satisfaction with life in general	Koralewicz and Zagorski (2009)
18+ aged, general public, Finland, 2000 N = 1000	<ul style="list-style-type: none"> - Health care in vicinity - Build environment 	Satisfaction with life	Kotakorpi and Laamanen (2010)
19–76 aged two neighbourhoods Rotter- dam, 2009 N = 102	<ul style="list-style-type: none"> - Sports facilities in vicinity - Local green - Cultural facilities in vicinity - Shops in vicinity - Transport facilities in vicinity 	Overall: Happiness in Life (O-HL)	Kumar (2017)
Residents neighbourhoods, Ohio and Texas, USA 2018 N = 1392	<ul style="list-style-type: none"> - Proximity of local amenities closeness to amenities - Transport mode - Perceived safety in vicinity - Local traffic safety - Perceived air pollution in vicinity - Street maintenance in vicinity - Quality of housing in vicinity - Local neatness - Perceived beauty of city 	Overall: Happy Person (O-HP)	Kwon et al. (2019)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
30–69 aged, general population, South Korea 2009 N = 1530	- Sports facilities in vicinity	Happiness	Kye and Park (2014)
19+ aged Gyeonggi-do region, South Korea, 2016 N = 42,000	- Satisfaction with amenities in vicinity - Satisfaction with local parking facilities - Local traffic safety - Place attachment	Positive emotion	Lee et al. (2022)
General public 10 major international metropolitan cities 2007 N = 10,000	- Transport facilities in vicinity - Availability of amenities in vicinity - Sports facilities in vicinity - Local nature - Satisfaction with local recreation - Leisure facilities in vicinity - Cultural facilities in vicinity - Perceived beauty of city - Street maintenance in vicinity - Local pollution - Satisfaction with water quality - Schools in vicinity - Satisfaction with school-facilities	Overall: Happiness	Leyden et al. (2011)
17+ aged Hangzhou city, China 2011–2012 N = 3000	- Satisfaction with local environment - Public goods and services in vicinity	Overall: Happiness in Life (O-HL)	Lin, (2016)
55–95 aged, Northern Interior Health Region, British Columbia, Canada, 1999 N = 875	- Satisfaction with amenities in vicinity - Satisfaction with local recreation	Overall Happiness	Michalos et al. (2001)
18+ aged, general public, Prince George, British Columbia, Canada, 1997–2005 N = 8664	- Satisfaction with housing - Satisfaction with local environment	Life satisfaction	Michalos and Orlando (2006)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
55+ aged, East and West Germany, 1995 and 1999 N = 1216	<ul style="list-style-type: none"> - Satisfaction with housing - Satisfaction with amenities in vicinity - Satisfaction with local transport 	Satisfaction with life in general	Mollenkopf (2002)
Adults, general public, South Africa, 2002 N = 26,000	<ul style="list-style-type: none"> - Satisfaction with health-services - Satisfaction with amenities in vicinity - Water supply in vicinity 	Life satisfaction	Moller (2007)
55–75 aged adults, Australia, followed 17 years, 2001–2018 N = 7568	<ul style="list-style-type: none"> - Satisfaction with neighborhood 	Life satisfaction	Nguyen et al. (2020)
18+ aged Oklahoma, United States of America, 1979 N = 2700	<ul style="list-style-type: none"> - Satisfaction with city - Satisfaction with neighbourhood - Satisfaction with housing 	Overall: Satisfaction with Life as a Whole (O-SLW)	Peck et al. (1985)
13+ aged Rotterdam, Netherlands, 2009 N = 4422	<ul style="list-style-type: none"> - Availability of amenities in vicinity - Clothing shops in vicinity - Computer and electronics shops in vicinity - Cultural facilities in vicinity - Daily necessity shops in vicinity - Financial services in vicinity - Health care in vicinity - Home supply shops in vicinity - Bars and restaurants in vicinity - Leisure facilities in vicinity - Transport facilities in vicinity - Vehicle shops in vicinity 	Overall: Happiness in Life (O-HL)	Putri (2015)
18+ aged general public, 15 EU member states and Turkey, 2003 N = 26,000	<ul style="list-style-type: none"> - Satisfaction with local transport - Satisfaction with health services 	Overall Life Satisfaction	Rose and Ozcan (2007)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
General public, Italy, 2008 N = 4130	- Cultural facilities in vicinity - Local nature	Overall: Happiness in Life (O-HL)	Sabatini (2011)
16+ aged, general public, Austria, 1984 N = 1776	- Satisfaction with leisure - Accessibility of leisure time activities	Overall quality-of-life	Schulz et al. (1985)
18+ aged, general public, urban areas, China, 2003 N = 8890	- Local nature - Build environment	subjective wellbeing	Smyth et al. (2008)
18+ aged 13 nations, 2005–2009 N = 23,000	- Satisfaction with water quality - Water supply in vicinity - Concern about clean environment - Perceived air pollution in vicinity - Sewage in vicinity	Overall: Satisfaction w Life as a Whole (O-SLW)	Sulemana et al. (2016)
18+ aged general public, Kazakhstan, 2015 N = 11,966	- Satisfaction with sporting - Satisfaction with amenities in vicinity - Satisfaction with health-services - Sports facilities in vicinity	Life satisfaction	Tlenchiyeva (2021)
General public, Flanders, Belgium, 2011 + 2012 N = 2990	- Satisfaction with amenities in vicinity	General satisfaction	VanOotegem and Verhofsstadt (2015)
Junior elite football players, Australia, 2017 N = 112	- Satisfaction with local environment	Life satisfaction	VanRens et al. (2018)
18+ aged, general public, United Kingdom, followed 18 years 1991 – 2008 N = 56,574	- % greenspace and gardens in vicinity	Life satisfaction	White et al., 2013
Students, Taiwan, 2007 N = 146	- Satisfaction with local transport	Overall QOL	Wu et al. (2014)
20+ aged urban population, Wuhan city, China, 2001 N = 308	- Satisfaction with leisure - Satisfaction with health-services - Satisfaction with local environment	Life satisfaction	Yang (2001)

Table 1 (continued)

People Place, Time N	Measure of Urban Environment Charac- teristics	Measure(s) of Happiness	Source
Residents communities, planned and unplanned, USA, 1973 N = 3894	<ul style="list-style-type: none">- Planned community- Satisfaction with leisure activities- Satisfaction with housing- Satisfaction with local environment- Attitude to vicinity	Satisfaction with life	Zehner (1977)

open, on which you can see full details of the observed relationship; the people investigated, sampling, the measurement of both variables and the statistical analysis. An example of such an electronic finding-page is presented in Fig. 3. This technique allows us to present the main trends in the findings, while keeping the paper to a controllable size, at the same time allowing the reader to check in-depth any detail they wish.

3.3.2 Organization of the findings

We first sorted the findings by the research method used. In Table 2, we distinguished horizontally a) cross-sectional studies, assessing same-time relationships between urban environment and happiness, b) longitudinal studies, assessing change in happiness following changes in an urban environment, and c) experimental studies, assessing the effect of induced changes in an urban environment on the happiness of residents. We presented aspects of the urban environment vertically.

Study Kwon et al. (2019): study US 2018

Public:	Residents neighborhoods in,Ohio and Texas, USA 2018
Survey name:	Unnamed study
Sample:	
Respondents:	N = 1392
Non Response:	
Assessment:	Questionnaire: web Assessment using online survey service Amazon's Mtur

Correlate

Authors's Label	Access to services
Our Classification	LOCAL: ECONOMY » ... » Proximity of local amenities LOCAL: RESIDENCE » ... » closeness to amenities
Error Estimates	Conbach alpha .81
Remarks	Subscale of the Neighborhood Environment Walkability Scale (Olvera et
Distribution	M: A.=3.21, B=3.00, C=2.83 SD: A=1.51, B=1.48, C=1.71
Operationalization	Affirmation to 3 statements A.Stores are within easy waking distance of my home. B.there are many places to go within easy walking distance of my home C.it is easy to walk to a transit stop from my home.

Observed Relation with Happiness

Happiness Measure	Statistics	Elaboration / Remarks
Q-HP-g-sq-n-7-c	$r = +.60$ $p < .05$	

Fig. 3 Example of an online findings page

Table 2 407 findings on correspondence between happiness and aspects of urban environment

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal	
Objective indicators				
Amenities in vicinity				
All types	- + + + + + + + + + + - - - & - & -	- + - + & + - + + + + - - - - - - + + + +		Europe
Bars and restaurants	-	- - -		Europe
Shops		- - - - - - - -	- -	Europe
Daily necessity shops	+ & -	+ + + +		Europe
Home supply shops		- + -		Europe
Clothing shops	-	+ + + -		Europe
Computer and electronics shops	-	+ + + +		Europe
Financial services	-	- - -		Europe
Vehicle shops	0	- - -		Europe
Leisure facilities	+ & - 0	- - +		Europe
Cultural facilities	+ & -	+ + & + + +		Europe
Playgrounds for children	- + -	- - -		Europe
Sports facilities	- -	- -		Europe
Water supply	+ / +	+		USA and Canada
Sewage	+ / + + / +			African countries
Drainage		- +		African countries
Health care		- + + + - + + +		South-American countries
				Europe

Table 2 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal	
Multi-functional buildings		+/+		Europe
Connectivity in vicinity				
Closeness to public transport	- - - - -	- - - - - +		Europe
Distance from city centre	+ - 0 +			Europe
	-			Non-Western countries
Traffic density in vicinity		+ -		South-American countries
		- -		Europe
Environment in vicinity				
Local appearance		+		Europe
Street maintenance		- -		Europe
Closeness to green/nature	- + + + 0	- + + + +		Europe
	-	+		Non-Western countries
		+		Australia and New Zealand
Urban design				
Compactness of city	- + +	-		Europe
Planned community	-	+ & + & - & -		Non-Western countries
	+			USA and Canada
Diversity of land use in vicinity	- 0 + +	- -		Europe
	0			Non-Western countries
Traffic density in urban area		-		Non-Western countries
		- -		Europe

Table 2 (continued)

Aspects of build environment	Observed correlation with happiness				Where
	Same time correlation		Over time correlation		
	Bivariate correlation	Partial correlation	Longitudinal	Experimental	
Subjective perceptions					
Amenities in vicinity					USA and Canada
All	+	++++			
Child facilities					
Cultural facilities		+ +/+ +			Europe
Health care					
Leisure facilities	+				Europe
Sports facilities	+ & + & +	+ & + & +	++		Non-Western countries
					Europe
Public goods and services	++++++	+ + - - \\\ + +			Non-Western countries
Shops in vicinity			+		Australia and New Zealand
Streetslights		- \\\ + / + +			Europe
Sewage	+ & +/+	++			South-American countries
		+			African countries
		+			Non-Western countries
		- \\\ -			South-American countries
		+			African countries
Water supply	+ & - & +				Europe
Connectivity in vicinity					USA and Canada
Road infrastructure		+++++			Europe
Sidewalks	+				USA and Canada
Public transport		+ / +			Europe
Traffic density	+				USA and Canada
Local traffic safety		+			Non-Western countries

Table 2 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation		
	Experimental			
Environment in vicinity				
Beauty of city				
Local appearance	+	++++++		USA and Canada Europe
Maintenance of streets and buildings	+	+/-		USA and Canada South-American countries
Neatness of vicinity		+& + ++		Europe South-American countries
Greenery		-/- +/+ -/-		Europe South-American countries
No air pollution	+	+ + ++ +++++		USA and Canada African countries South-American countries Europe
Urban design				
Public Spaces in vicinity		+/-		Europe
Walkability				
Place				
Neighbourhood				
Satisfaction with ...				
Amenities in vicinity				
				USA and Canada
				Non-Western countries

Table 2 (continued)

 Springer

Table 2 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Over time correlation			
	Same time correlation		Experimental	
	Bivariate correlation	Partial correlation		
Local green	+ + + \ + \ +	+ + + \ + \ + + + + + + + +		USA and Canada
	+	+ + +		
		+		
		— +		
Place				South-American countries
City	+			USA and Canada
Neighbourhood	+	+		USA and Canada
	+			Australia and New Zealand

Meaning of signs

- + positive and significant
- + positive, non-significant- or significance not reported
- 0 unrelated
- negative, not significant or significance not reported
- negative, significant
- +/- positive in one subgroup, negative in another
- + \ + positive on two measures of happiness
- + !- positive before control, negative after
- + / + significant on one statistic, not significant on another
- + &- positive on one indicator, negative on another

Use of signs

Signs involve links to on-line detail about this finding

Use Control + Click to open a finding page

3.3.3 Presentation of the findings

The observed quantitative relationships between urban settings and happiness are summarized using 3 possible signs: + for a positive relationship, – for a negative relationship, and **0** for a non-relationship. Statistical significance is indicated by printing the sign in **bold**. Each sign contains a link to a particular finding page in the World Database of Happiness. Some of these findings appeared in more than one cell of the tables. This is the case for pages on which a 'raw' (zero-order) correlation is reported next to a 'partial' correlation, in which the effect of the control variables is removed. Several cells in the tables remain empty and denote blanks in our knowledge.

3.3.4 Advantages and disadvantages of this review technique

There are pros and cons to the use of a finding-archive such as the World Database of Happiness and plusses and minuses to the use of links to an on-line source in a text like this one.

Use of a finding-archive Advantages are: a) efficient gathering of research on a particular topic, in this case on happiness, b) sharp conceptual focus and selection of studies on that basis, c) uniform description of research findings on electronic finding-pages, using a standard format and technical terminology, d) storage of these finding pages in a well searchable database, e) which is available on-line and f) to which links can be made from texts. The technique is particularly useful for the ongoing harvesting of research findings on a particular subject. Disadvantages are: x) the sharp conceptual focus cannot easily be changed, y) considerable investment is required to develop explicit criteria for inclusion and the definition of technical terms and software, z) it pays only when a lot of research is processed on a continuous basis.

Use of links in a review paper The use of links to an on-line source allows us to provide short summaries of research findings, in this text by using +, – and 0 signs in bold or not, while allowing the reader access to the full details of the research. This technique was used in earlier research synthesis on private wealth and happiness (Jantsch & Veenhoven, 2019) and is described in more detail in Veenhoven et al. (2022). Advantages of such presentation are: a) an easy overview of the main trend in the findings, in this case, many + signs, b) access to the full details behind the links, c) an easy overview of the white spots in the empty cells in the tables, and d) easy updates, by entering new sign in the tables. Disadvantages are: x) much of the detailed information is not directly visible in the + and – signs, y) in particular not the effect size and control variables used, and z) the links work only for electronic texts.

3.3.5 Differences with narrative reviewing

Usual review articles cannot report much detail about the studies considered and rely heavily on references to the research reports read by the reviewer, which typically figure on a long list at the end of the review paper. A reader of such reviews can hardly check the recap of research findings by the reviewer. As a result, such reviews are vulnerable to interpretations made by the reviewer and methodological variations can escape the eye.

Another difference is that the conceptual focus of narrative reviews in this field is often loose, covering fuzzy notions of ‘well-being’ rather than a well-defined concept of ‘happiness’ as used here. This blurs the view of what the data tell and involves a risk of ‘cherry picking’ by reviewers. A related difference is that narrative reviews of happiness research often assume that the name of a questionnaire corresponds with its conceptual contents. Yet, several ‘happiness scales’ measure different things than happiness as defined in Section 2.1, e.g., the Life Satisfaction Scale (Neugarten et al., 1961), which measures mainly social functioning. Another difference is that narrative reviews of the research literature on a topic focus typically on interpretations advanced by authors of research reports, while in this quantitative research synthesis we focus on the data actually presented.

3.3.6 Difference with common meta-analysis

Though this research synthesis is a kind of meta-analysis, it differs from usual meta-analytic studies in several ways. One difference is the above-mentioned conceptual rigor; like narrative reviews, many meta-analyses take the names given to variables for their content, thus adding apples and oranges. Another difference is the direct online access to full detail about the research findings considered, presented in a standard format and terminology, while traditional meta-analytic studies just provide a reference to research reports from which the data were taken. The last difference is that most meta-analytic studies aim at summarizing the research findings in numbers, such as an average effect size. Such quantification is not well possible for the data at hand here and is not required for answering our research questions. Our presentation of the separate findings in tabular schemers provides more information, both on the general tendency and the details.

4 Results

Having settled the above preliminary issues, we can now revert to the research questions mentioned in Section 1.3 and answer them one by one.

4.1 What urban conditions are most/least related to the happiness of residents?

This question can be addressed using different methods, a) same-time correlation between aspects of the built environment and the happiness of urbanites (cross-sectional analysis), b) follow-up correlation between change in urban environment and change in happiness and c) experimental studies in which the effect of induced change in the urban environment on happiness is assessed. These possible methods are presented horizontally on Table 2. Almost all the findings are based on the cross-sectional method and appear in the left-hand column for same-time correlations. There are no longitudinal findings, presented in the right-hand column for over-time correlations. The column for experimental findings is empty, which denotes that no such research has been done as yet. This leaves us largely in the dark about the causal effects behind the observed cross-sectional correlations, as we will discuss in Section 4.4 below.

On Table 2 we presented 445 research findings on correspondence between happiness and aspects of the urban environment, of which 186 concerned objective indicators of urban environment, 146 deal with subjective perceptions of the environment and 115 concerned subjective satisfaction with the urban environment.

4.1.1 Objective characteristics of urban environment

In the top-section of Table 2, a lot of minus signs appear, few of which are printed thick. So, mostly non-significant negative correlations between objectively assessed features of the urban environment and the happiness of people who live there.

Amenities At a glance, one can see that the correlations tend to be negative, meaning that urbanites tend to be less happy the closer they live to urban facilities. This is particularly the case for living close to *bars and restaurants* and *shops*, with the exception of *daily necessity shops*. Negative correlations were also observed for near-by *playgrounds* for children and *sports facilities*. Positive correlations were found with closeness to *cultural facilities* and *health care*, though not consistently so and mostly not significant. Significant positive correlations appeared with the availability of *multi-functional buildings* and with the basic provisions of *drainage*, *sewage* and *water supply*.

Connectivity The observed correlations of happiness with *closeness to public transport* are negative and so are the correlations with *local traffic intensity*. Apparently, people live happier the farther away they live from urban hectic.

Environment Urbanites tend to be happier when living in a *well-kept neighborhood* and close to *greenery*.

Urban design Urbanites were found to be less happy when living in a *compact city*, which typically involves high-rise buildings. Likewise, their happiness was lower in *multi-functional* areas, which means that functional segregation goes with greater happiness. This may be a reason for the observed positive correlation of happiness with living in a *planned community*.

All this suggests that urbanites tend to be happier when living in a residential area at a distance to urban turmoil in the city center. Note that most of these findings are statistically insignificant.

4.1.2 Subjectively perceived characteristics of urban environment

In the middle section of Table 2 we see mainly + signs, most of which are printed thick.

Amenities Urbanites tend to be happier, the more access they perceive to have to local amenities. This holds for all kinds of amenities, and also for the above-mentioned amenities of which the objectively assessed accessibility was found the go with less happiness.

Connectivity Likewise, subjective perceptions of access to *transport facilities* tend to go with greater happiness, while the above-mentioned correlations between happiness and on actual connectivity were typically negative.

Environment Urbanites were found to be happier the higher they rate the *appearance* of their environment, the closer they perceive to live to *greenery* and the less *air pollution*

they think there is. This fits largely with the above-mentioned correlations between happiness and objectively assessed characteristics of the urban environment.

Urban design There was no clear correlation between the happiness of urbanites and their perception of *public spaces* in the vicinity. However, urbanite's happiness correlated positively with perceived *walkability* of their locality. These variables are missing in the above section on objectively assessed characteristics of the urban environment.

4.1.3 Satisfaction with aspects of urban environment

In the lower section of Table 2 we see only + signs, which means that urbanites' happiness (satisfaction with life-as-a-whole) tends to go together with satisfaction with any aspect of their living environment. The positive correlations of happiness with *satisfaction with amenities* contrasts with the above-mentioned negative correlation with actual access to amenities. Likewise, the observed positive correlations of happiness with *satisfaction with connectivity* contrasts with the earlier noted negative correlation with actual connectivity. The only dissonant in this pattern of positive correlations is the insignificant negative correlation between happiness and *satisfaction with greenery*. A look at the detail behinds this finding revealed that a lot variables were controlled in this case, among which satisfaction with other aspects of the urban environment, which is likely to have erased any variance in happiness.

4.2 How universal are these correlates? Is there a difference across cultures?

Of the 55 studies considered here, one covers the general public in 5 metropolitan areas in OECD nations (Brown et al., 2015) and one compares autochthones (standard Dutch people) and allochthones (mostly migrants) in the city of Rotterdam (Auma, 2015). Another study compared African countries with developed nations (Sulemana et al., 2016).

The results are presented on Table 3, which is a selection from Table 2 on which differences in geographical location are indicated.

4.2.1 Differences

Objective characteristics of the urban environment Availability of *amenities* had positive associations with happiness in North America, while the correlations tended to be negative in European countries. The correlation between *connectivity* and happiness is mainly negative in European nations, but positive in North America. *Distance from city center* has both positive and negative correlation in Europe, Asia, and South American countries. The correlation between *Closeness to green spaces* is mainly positive in European countries and Asia. *Diversity of land use* in vicinity has mainly negative correlation with happiness in Europe, while its correlation in Asia is close to zero.

Subjectively perceived characteristics of the urban environment Perceived availability of *sports facilities* has a positive association with happiness in both Asia and Europe. Additionally, the perceived availability of *public goods* and amenities has a mainly positive correlation with happiness in Asia and Australia. Furthermore, the perceived availability of *sewage* has a positive association with happiness in Africa and Asia, while the result

Aspects of build environment

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal	
Objective indicators				
Amenities in vicinity				
All types	-++ ++++++ - -&-&-	--+ & ++ -+++ -+++ +-+		Europe
Bars and restaurants	-	+ +		Europe
Shops		+ + + + -		Europe
Daily necessity shops	+ & -	+ + + +		Europe
Home supply shops		+ + -		Europe
Clothing shops	-	+ + + -		Europe
Computer and electronics shops	-	+ + + +		Europe
Financial services	-	+ -		Europe
Vehicle shops	0	+ -		Europe
Leisure facilities	+ & - 0	+ + +		Europe
Cultural facilities	+ - & -	+ & + + + +		Europe
Playgrounds for children	+ + -	+ -		Europe
Sports facilities	+ -	+ -		Europe
Water supply	+ / +	+		USA and Canada
Sewage	+ / + + / +			African countries
Drainage		- +		African countries
Health care		- + + + - + + +		South-American countries
Multi-functional buildings		+ / +		Europe

Table 3 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal	
Connectivity in vicinity				
Closeness to public transport	- - - - - -	- - - - - -	- - - - - -	Europe
Distance from city centre	+ - 0 +			Europe
	-			Non-Western countries
		+ -		South-American countries
		- -		Europe
Traffic density in vicinity				
Environment in vicinity				Europe
Local appearance		+		Europe
Street maintenance		- -		Europe
Closeness to green/nature	- - + + 0	- + + + +	+	Non-Western countries
	-		+	Australia and New Zealand
Urban design				
Compactness of city	- - +	-		Europe
Planned community	-	+&+&-&-		Non-Western countries
	+			USA and Canada
Diversity of land use in vicinity	- 0 - +	- -		Europe
	0			Non-Western countries
Traffic density in urban area				Non-Western countries
		- -		Europe
Subjective perceptions				
Amenities in vicinity				
All	+	+ + + +		USA and Canada

Table 3 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal	
Child facilities				
Cultural facilities			+ +/+/+	Europe
Health care				Europe
Leisure facilities	+		+&+&+	Non-Western countries
Sports facilities	+&+&+		+/+	Europe
			+ + - -/+	Non-Western countries
Public goods and services	+ + + + +		+	Australia and New Zealand
			-/+ +/+ +/+	Europe
Shops in vicinity			+/+	South-American countries
Streetslights			+	African countries
Sewage	+&+/+		+	Non-Western countries
			-/+	South-American countries
Water supply	+&-&+		+	African countries
Connectivity in vicinity			++++/+	Europe
Road infrastructure	+		+/+	USA and Canada
Sidewalks				Europe
Public transport				USA and Canada
Traffic density	+		+	Non-Western countries
Local traffic safety				

Table 3 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation		
Environment in vicinity				
Beauty of city				
Local appearance	+	+++++		USA and Canada Europe
Maintenance of streets and buildings	+			USA and Canada South-American countries
Neatness of vicinity		++		Europe
Greenery		+/+		South-American countries Europe
No air pollution	+	-		South-American countries USA and Canada
		+		African countries
		++		South-American countries
		+++++		Europe
Urban design				
Public Spaces in vicinity		+/-		Europe
Walkability	+			USA and Canada
Place				
Neighbourhood		++		Non-Western countries

Table 3 (continued)

Aspects of build environment	Observed correlation with happiness			Where
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation		
Satisfaction with ...				
Amenities in vicinity				
All		+		Non-Western countries
		++		Europe
		++		USA and Canada
		+		USA and Canada
Local recreation	++ + ++	++		Europe
Medical services				USA and Canada
Public services	+	++		Europe
School facilities (Local School)	++ ++ ++ +			USA and Canada
	+			Europe
Shopping facilities	++			USA and Canada
Sport facilities	+			Non-Western countries
Water quality	++ ++ ++			Non-Western countries
Connectivity in vicinity				
Local Transport	++ + + ++ ++			USA and Canada
	++ ++			Non-Western countries
		++ +		Europe
		++		South-American countries
		+		Australia and New Zealand
Local parking facilities		+		Non-Western countries

Table 3 (continued)

Aspects of build environment	Observed correlation with happiness				Where
	Same time correlation		Over time correlation		
	Bivariate correlation	Partial correlation	Longitudinal	Experimental	
Environment in vicinity					
Local environment	+	+			Europe
	+				Australia and New Zealand
	+	+			Non-Western countries
	+	++	++	++	USA and Canada
	+	+++	+++	+++	
	+		+		South-American countries
Local green					
Place					
City	+				USA and Canada
Neighborhood	+	+			USA and Canada
	+				Australia and New Zealand

is negative in South American countries. We found that perceived *local appearance* has a positive impact on happiness in both European and American countries. Furthermore, *the maintenance of streets and buildings* is positively associated with happiness in American countries, whereas the associations in South American countries have both positive and negative effects. Additionally, the perceived *neatness of the vicinity* has a positive correlation in both Europe and South America. Finally, the correlation between the *absence of air pollution* in the vicinity and happiness is positive in America, South America, Africa, and Europe, suggesting that it has a universal effect on the happiness of citizens.

Satisfaction with aspects of urban environment Satisfaction with *all amenities* has a positive association with happiness in Asia, Europe, and America, suggesting that it can be considered a universal positive effect on happiness in urban environments. Moreover, satisfaction with *local recreation* has a positive effect on both European and American countries. Additionally, the correlation between satisfaction with *school facilities (local school)* and happiness is positive in both American and European countries. Satisfaction with *connectivity (local transport)* has a positive correlation with happiness in America, Asia, Europe, Australia, and South America, indicating that it can be suggested to have a universal positive effect on the happiness of citizens in the vicinity. Finally, satisfaction with *the local environment* has a positive association with happiness in Europe, Asia, America, and Australia, and can be considered an important positive association with happiness in the vicinity.

4.2.2 Similarities

Objectively assessed urban characteristics Access to *playgrounds and sports facilities* is positively correlated with the resident's happiness all over the world, including European countries, the UK, Asia (South Korea), United States of America. The correlation is strongest in Asian countries. *Local water supply* has a positive sign in African and in developed countries. *Commuting time* relates negatively to happiness of citizens in both European and Asian countries. Additionally, the result showed a positive correlation between *public space* in the area in European countries.

Perceived characteristics of the urban environment The correlation with perceived air pollution (positive with 'no') appeared to be universal.

Satisfaction with aspects of the urban environment Likewise, the correlations of happiness with *satisfaction with the amenities* in the vicinity was universally positive as was *satisfaction with water quality*. The same held for *satisfaction with local transport* and for the wider *satisfaction with the local environment*.

4.3 Does measurement of happiness make a difference?

Above in Sect. 2.2 we distinguished between *overall happiness* and two *components of happiness*; an affective component (how well one feels most of the time) and a cognitive component (degree to which one perceives to get from life what one wants). In that section we further presented some illustrative measures of these happiness variants. Does that make any difference in observed strength of correlation with aspects of the urban environment? A reason to expect a difference is that affective experience reflects the gratification of universal human *needs*, while cognitive contentment rather draws on comparison with culturally

relative *wants* (cf. Section 2.2). This implies a difference in use of the findings: urban design should orient on meeting long-term human *needs*, while marketing requires information of the fit with current *wants*. As yet, this distinction is hardly acknowledged in this field.

Table 4 is a variant of Table 2 on which we indicated the kind of happiness measured. Note that the cognitive measure of happiness was seldom used in research on this subject.

4.3.1 No differences in the direction of correlations

In the top section of Table 4 we can see that the correlations of happiness with *objective characteristics* of the urban environment, were all assessed using measures of overall happiness and provide therefore no cases for comparison with measures of the cognitive component of happiness.

Likewise, in the middle section of Table 4, we can see that only measures of overall happiness and highly similar combinations of overall happiness and affect have been used in studies that assessed the relation between happiness and *subjective perceptions* of the urban environment. So, no good cases for comparison across components of happiness in this case either.

There is more variation in the measures of happiness used in the bottom part of Table 4. No differences appear in the few cases where different measures of happiness had been used for the same aspect of the urban environment.

4.3.2 No difference in strength of correlations

Below in Table 5, we consider the *strength* of the observed correlations using the same category to show the measure of happiness used. Particularly informative are the following cases where the correlation with a same aspect of the urban environment in the same study was computed for different measures of happiness. These cases are:

- Satisfaction local transport $+0.23/+0.24$
- Satisfaction neighborhood $+0.23/+0.24 +0.24/+0.24$.
- Satisfaction with local schools $+0.07/+0.19/+0.19$.

These three cases neither show a clear difference. So, for the time being, this issue is not settled.

4.4 How strong are the correlations?

In Table 5 we presented the observed correlation coefficients. We limited to bi-variate correlations expressed on range -1 to +1. Partial correlations differ in the variables partial led out and can therefore not be compared for strengths. The many blanks in the table denote white spots in current knowledge.

4.4.1 Objective characteristics of the urban environment

The size of the correlations varies between -0.26 (set of amenities) to +0.36 (sewage), but are typically low and insignificant. The average correlation in this set of findings is -0.012.

Happiness variant

Aspects of build environment	Observed correlation with happiness			Happiness variant
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal experimental	
Objective indicators				
Amenities in vicinity				
All types	- + + + + + + + + + + + + + - &-	+ + + + + + + + + + + + + + + &+ - &-		Overall happiness
Bars and restaurants	-	+ + + + + + + + + + + + + + + &-		Overall happiness
Shops	+ &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Daily necessity shops		+ + + + + + + + + + + + + + + &-		Overall happiness
Home supply shops		+ + + + + + + + + + + + + + + &-		Overall happiness
Clothing shops	-	+ + + + + + + + + + + + + + + &-		Overall happiness
Computer and electronics shops	-	+ + + + + + + + + + + + + + + &-		Overall happiness
Financial services	-	+ + + + + + + + + + + + + + + &-		Overall happiness
Vehicle shops	0	+ + + + + + + + + + + + + + + &-		Overall happiness
Leisure facilities	+ &- 0	+ + + + + + + + + + + + + + + &-		Overall happiness
Cultural facilities	+ &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Playgrounds for children	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Sports facilities	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Water supply	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Sewage	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Drainage	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Health care	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness
Multi-functional buildings	+ + + + + + + + + + + + + + + &-	+ + + + + + + + + + + + + + + &-		Overall happiness

Table 4 (continued)

Aspects of build environment	Observed correlation with happiness				Happiness variant
	Same time correlation		Over time correlation		
	Bivariate correlation	Partial correlation	Longitudinal	experimental	
Connectivity in vicinity					
Closeness to public transport	- - - - -	- - - - -	- - - - -	- - - - -	Overall happiness
Distance from city centre	+ + + + +		+ +		Overall happiness
Traffic density in vicinity			- +		Overall happiness
Environment in vicinity					
Local appearance			+		Overall happiness
Street maintenance			- +		Overall happiness
Closeness to green/nature	- + + + +		- + + + +	+	Overall happiness
Urban design					
Compactness of city	- + +		-		Overall happiness
Planned community	+	-	+ & + & - & -		Overall happiness
Diversity of land use in vicinity	- 0 0 1 - +		-		Overall happiness
Traffic density in urban area			- - -		Overall happiness
Subjective perceptions					
Amenities in vicinity					
All	+		+ + + + +		Overall happiness
Child facilities	+		+		Overall happiness
Cultural facilities	+		+	+ + + + +	Overall happiness
Health care			+		Overall happiness
Leisure facilities	+	+	+		Overall happiness
Schools			+		Overall happiness
Sports facilities	+	+ & + & +	+	+ + + & + + +	Overall happiness

Table 4 (continued)

Aspects of build environment	Observed correlation with happiness			Happiness variant
	Same time correlation		Over time correlation	
	Partial correlation			
	Bivariate correlation	experimental		
Public goods and services	+ + + + + + +	+ + - + - \		Overall happiness
Shops in vicinity				Mixed Overall happiness + hedonic level
Streetslights	+	- \ + / + + +		Overall happiness
Sewage	+ & +	+ + \ + \ + + - \		Overall happiness
Water supply	+	-		Hedonic level of Affect
Connectivity in vicinity	+ & - & +	+ +		Overall happiness
Road infrastructure				Overall happiness
Sidewalks	+	+ + + + + + +		Overall happiness
Public transport	+			Overall happiness
Traffic density	+	+ + / +		Overall happiness
Local traffic safety		+		Mixed Overall happiness + hedonic level
Environment in vicinity				Overall happiness
Beauty of city	+	+		Overall happiness
Local appearance	+	+ + + + + + +		Overall happiness
Maintenance of streets and buildings	+	+ \ -		Overall happiness
Neatness of vicinity		+ & + + + +		Overall happiness
Greenery		+ - / - + / + - \		Overall happiness
No air pollution	+	+ + + + + + + + +		Overall happiness

Table 4 (continued)

Aspects of build environment	Observed correlation with happiness			Happiness variant
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation		
Urban design				
Public Spaces in vicinity				Overall happiness
Walkability	+		+/-	Overall happiness
Place				
Neighbourhood			++	Mixed Overall happiness + hedonic level
Satisfaction with ...				
Amenities in vicinity			+	Mixed Overall happiness + hedonic level
All				Overall happiness
			+ \+ + \+	Overall happiness
Local recreation	+ + \+ \+	+	+	Mixed Overall happiness + hedonic level
	++			Mixed Overall happiness + hedonic level
Medical services	+			Overall happiness
Public services	+		++	Contentment
				Mixed Overall happiness + hedonic level
School facilities (Local School)	++ ++			Overall happiness
	+ + \+ + + +			Contentment

Table 4 (continued)

Aspects of build environment	Observed correlation with happiness			Happiness variant
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation	Longitudinal	
Shopping facilities	++			Mixed Overall happiness + hedonic level
Sport facilities	+			Overall happiness
Water quality	++\++	++\++	++	Overall happiness
	++		+	Contentment
Connectivity in vicinity				
Local Transport	++	+		Mixed Overall happiness + hedonic level
	++	++	++	Overall happiness
	++	++	++	
	+			Contentment
	+			Hedonic level of Affect
Local parking facilities			+	Mixed Overall happiness + hedonic level
Environment in vicinity				
Local environment	++	++	++	Overall happiness
	++	++	++	
	++	++	++	
Local green	++	++	++	Overall happiness
Place	++	++	++	
City	++	++	++	Overall happiness

Table 4 (continued)

Aspects of build environment	Observed correlation with happiness			Happiness variant
	Same time correlation		Over time correlation	
	Bivariate correlation	Partial correlation		
			experimental	
Neighbourhood	+	+	++	Overall happiness
	++			Hedonic level of Affect
			+	Mixed Overall happiness + hedonic level

Table 5 113 Observed size of bi-variate correlations between happiness and aspects of urban environment

Aspects of build environment	Observed bi-variate correlation with happiness expressed in a coefficient ranging from -1 to +1	Happiness variant
Objective indicators		
Amenities in vicinity		
All	-0.26+0.09/-0.04/-0.05/-0.01/-0.02/-0.06/-0.02/-0.01/-0.04/-0.01/-0.07	Overall happiness
Bars and restaurants		
Shops		
Daily necessity shops		
Home supply shops		
Clothing shops		
Computer and electronics shops		
Financial services		
Vehicle shops	0	Overall happiness
Leisure facilities	0	Overall happiness
Cultural facilities	+0.02	Overall happiness
Child facilities		
Sport facilities	-0.01/-0.07/-0.06/-0.07/-0.02	Overall happiness
Water supply	+0.21	
Sewage	+0.22 +0.36	Overall happiness
Drainage		Overall happiness
Health care		
Multi-functional buildings		
Connectivity in vicinity		
Public transport	-0.20	Mixed Overall happiness + hedonic level
Commuting time	-0.05/-0.18	Overall happiness
Distance from city centre		

Table 5 (continued)

Aspects of build environment	Observed bi-variate correlation with happiness expressed in a coefficient ranging from -1 to +1	Happiness variant
Local traffic density		
Local traffic safety		
Transport facilities in vicinity		
Environment in vicinity		
Local appearance		
Local neatness		
Maintenance of streets and buildings		
Local green/nature		
No air pollution		
Urban design		
Public Spaces in vicinity		
Compactness of city	$-.33$	Overall happiness
Planned community	$+.66$	Overall happiness
Diversity of land use in vicinity	$+.01$	
Walkability		
Subjective perceptions		
Amenities in vicinity		
All	$+.60$	Overall happiness
Child facilities		
Cultural facilities		
Health care		
Leisure facilities	$+.17$	Mixed Overall happiness + hedonic level
Schools		
Sport facilities		
Public goods and services	$+.22$ $+.01$ $+.02$ $+.06$ $+.07$ $+.06$ $+.11$	Overall happiness

Table 5 (continued)

Aspects of build environment	Observed bi-variate correlation with happiness expressed in a coefficient ranging from -1 to +1	Happiness variant
Shops in vicinity		
Streetlights		
Sewage		
Water supply		
Connectivity		
Road infrastructure		
Sidewalks	+12	Overall happiness
Public transport		
Traffic density	−09	Overall happiness
Local traffic safety		
Environment		
Local appearance		
Beauty of city	+24	Overall happiness
Neatness of vicinity		
Maintenance of streets and buildings	+19	Overall happiness
Greenery		
No air pollution in vicinity		
Urban design		
Walkability	+60	Overall happiness
Place		
Neighbourhood	+41	Overall happiness
Satisfaction with ...		
Amenities in vicinity	+22	Overall happiness
Child facilities	+27/+12	Mixed Overall happiness + hedonic level

Table 5 (continued)

Aspects of build environment	Observed bi-variate correlation with happiness expressed in a coefficient ranging from -1 to +1	Happiness variant
Recreation	+22 +.15\ +.20\ +.11 +.27	Overall happiness
Schools	+20 +38 +.07\ +.19 +.41 +.17 +12\ +.08 +.15\ +.07 +.19 +.13 +.22\ +.10 +.37 +.34 +.37 +.34\ +.31 +.36 +.41\ +.38 +.36 +.42\ +.38 +.66\ +.10	Mixed Overall happiness + hedonic level Overall happiness Mixed Overall happiness + hedonic level Contentment Mixed Overall happiness + hedonic level Overall happiness Overall happiness Contentment
Shops		
Sport facilities		
Water quality		
Connectivity		
Local Transport	+22\ +.27 +.14\ +.17 +.20 +.25 +.20\ +.24\ +.13\ +.26 +.30\ +.29 +.10 +.15	Overall happiness Mixed Overall happiness + hedonic level Hedonic level of Affect Contentment
Local parking facilities		
Environment		
Local environment	+41 +.26 +.69 +.25 +.35 +.31\ +.37\ +.35 +.67 +.51 +.45 +.30 +.23	Overall happiness
Local green		
Place		
City	+20	Overall happiness
Neighbourhood	+43 +.20 +.23\ +.24\ +.24\ +.24	Overall happiness Hedonic level of Affect

Selection from Table 2

Happiness related most positively to availability of *good water* and *sewage* and most negative to *commuting time*.

4.4.2 Subjective perceptions of the urban environment

The correlations range between -0.09 (traffic density) and +0.60 (walkability). The average correlation is +0.18. Happiness relates positively to perception of availability of *amenities* in the environment, though not very strongly. (Remember that the correlation with objective measures of the same was negative). Stronger correlations were observed between happiness and perceived *beauty of the city* and the overall rating of *quality of the neighborhood*.

4.4.3 Satisfaction with aspects of the urban environment

The findings are more abundant on this subject and all correlations are positive, ranging from +0.10 (satisfaction with shops among males) to +0.69 (overall satisfaction with neighborhood). The average correlation is +0.27. Note that satisfaction with aspects of connectivity is modestly positive, while happiness was found to be negatively related to actual connectivity (cf. Section 4.4).

The above pattern of difference in strengths of correlation across the three kinds of measures of urban environment is commonly observed in social indicators research. An illustrative case is local crime, there is little correlation between happiness and objective crime rates, but a much stronger correlation between happiness and perceived prevalence of crime and with indicators of (dis)satisfaction with crime, such as fear of crime (e.g. Cordeiro et al., 2019). Note that we did not include crime in this research synthesis, since it is not part of the build environment.

4.5 What do these correlations tell us about the causal effects of the urban environment on happiness?

The main reason for all this correlational research was to identify the urban determinants of happiness. Yet the observed correspondence can also be due to other causes; the correlations can be driven by a third factor or by effects of happiness on selection into urban environments and the perception of these. Identification of causal effects requires longitudinal studies or better experimental studies, which are not yet available on this subject as the empty rows at the right-hand side of Table 2 demonstrate. Hence, we must do with clues from the control variables used as presented in Table 6.

4.5.1 Possible spuriousness of correlations

Spurious correlation was typically ruled out by computing partial correlations, from which the effect of potentially intervening variables was removed. Analyses of that kind are reported in column 3 of Table 2. In Table 6 we presented the observed correspondence for cases in which both bi-variate and partial correlations coefficients were available on the comparable range of -1 to +1.

Control for income wipes away the modest zero-order correlation with *objective availability of amenities* in the vicinity. In the case of *subjective perceptions*, the partial correlation with availability of *public goods and services* turned bigger after control for objective

Table 6 42 Findings on correspondence between happiness and aspects of build environment: *Effect of controls on size of correlation*

Aspects of build environment	Correlation with happiness: coefficients on range -1 to +1		
	<i>Bivariate correlation (r)</i>	<i>Partial correlation (Beta or rpc)</i>	<i>Control variables</i>
Objective indicators			
Facilities for sport, culture, nature, children, and community work	-.26	-.02	income
Cultural facilities	+.02	+.00	income
Playground for children	-.06	-.04	income
	-.07	-.06	income
	-.02	-.01	income
	-.01	-.01	income
Sport facilities	-.01	-.01	income
	-.07	-.01	income
Subjective indicators			
Neighbourhood perceived as pleasant	+.41	+.16	- sex
			- age
			- marital status
			- religion
			- education
			- personality
			- positive attitude
			- emotionally concerned
			- altruistic and conscientious
			- satisfaction with life-domains
			- education
			- income
			- social life
			- act according to vision
Satisfaction with. City	+.20	+.08	Satisfaction with local
			- amenities
			- traffic safety
			- parking
			Local social cohesion
			- neighboring
			- citizen participation
			Housing
			- lives in apartment (vs separate house)
			- owns house
			- residence period, residence period squared
			Socio-economic characteristics
			- age
			- gender
			- education
			- income
			- employment

Table 6 (continued)

Aspects of build environment	Correlation with happiness: coefficients on range -1 to +1		
	<i>Bivariate correlation (r)</i>	<i>Partial correlation (Beta or rpc)</i>	<i>Control variables</i>
Amenities in vicinity	+ .41	+ .14	Socio-demographics - sexe - age - marital status - religion - education Personality - positive attitude - emotionally concerned - altruistic and conscientious Satisfaction with life-domains - education - income - social life - act according to vision
Local environment	+ .45	+ .11	- health and medical care - marriage - local environments - social relations - leisure
	+ .30	+ .27	income
	+ .37	+ .06	- sex - Age - Ethnicity - Employment
	+ .23	+ .03	Socio-demographic variables: - age - sex, - education - marital status - family income Housing situation - dwelling unit value, tenure - length of residence - number of children in the household Satisfaction with: - standard of living - family life - use of leisure time - marriage - health - Housework - job - dwelling unit - community
Satisfaction with water quality	+ .66	+ .40	average household income in nation

factors (income, education, residence of origin), subjective factors (such as social activities, health conditions, living environment), positive views (such as optimistic about future, income secure, living condition near expectation), and social quality factors (such as social cohesion, social empowerment). In the case of *subjective satisfaction* with the local environment, control for many more variables reduced the correlations considerably but some association remains.

These scattered findings suggest that there is at least some real association in about half of the cases.

4.5.2 Possible effects of happiness

Happiness can drive the observed correlations in three ways: a) happiness can be of influence on where people choose to live, b) happiness can color the perception of that environment and c) happiness can affect satisfaction with urban environment. This latter influence is known as the ‘top-down’ effect’ (Headey et al., 1991), satisfaction with life-as-a-whole determining the satisfaction with domains of life; in this case satisfaction with place of residence. Such reversed causality cannot be identified from the same-time correlations; at best control for intervening variables can provide clues, such as in the case of *satisfaction with local environment* where the bi-variate correlation of +0.23 with happiness was reduced to +0.03 after control for satisfaction with several other domains of life (cf. Table 5) which together are close to happiness and suggest that the effects b and c were involved.

Causal effects of happiness can be better identified using longitudinal or experimental studies. No such studies have been performed as yet, at least not using a valid measure of happiness, hence the columns at the right side of Table 2 remain empty. Such is research is well possible such as when citizens are followed before and after a move in a city or when some people are relocated in the context of urban renewal and others not, yet the column dedicated to this method in Table 2 remains empty. Still, natural experiments are well possible, such as in the case of relocation following urban renewal.

4.6 How do urban conditions affect the happiness of inhabitants? What are the causal mechanisms?

4.6.1 Direct effects

The built environment can have direct effects on citizen’s happiness, for instance when good architecture generates a continuous stream of pleasurable experiences. Conversely, annoyance due to poorly designed architecture can have a direct negative effect on happiness. If such direct effects exist, they can affect happiness in two ways; though its affective component or through its cognitive component.

4.6.2 Fit with human needs

Above in Sect. 2.2, we distinguished two components of happiness; an affective component (how well one feels most of the time) and a cognitive component (getting what you want). There is good evidence that the affective component reflects the degree to which universal human *needs* are gratified, while cognitive contentment rather mirrors fit with culturally specific *wants* (Kainulainen et al., 2018).

There are good reasons to orient on needs in the first place in urban planning. Urban planning must cater different generations and cultures and it is morally questionable to follow wants that do not fit needs. Another reason is that happiness appears to affect physical health mainly through its affective component (Veenhoven, 2008) and that planning for a happy city through that channel will coincide with the pursuit of healthy cities.

In this context, reconsider Table 4. Most findings are overall happiness, meaning that an affectively toned measure of happiness was used. That would imply a causal effect though need gratification.

4.7 Fit with wants

In Table 4 we saw only 7 out of 407 correlations were associated with contentment, denoting a relationship with a cognitive measure of happiness. All these 7 correlations concern satisfaction with an aspect of the urban environment, such as satisfaction with local transport. Satisfaction ratings are likely to reflect the fit between wants and reality but can also be due to a fit with needs.

4.7.1 Indirect effects

The urban environment can also affect happiness indirectly when fostering conditions for happiness, for instance when the fresh air and urban green add to the residents' health and through better health adds in turn to greater happiness. It is even possible that a negative direct effect is outweighed by such positive effects, for instance when a negative effect of living in an architecturally unattractive residential quarter is compensated by the positive effects of local air quality on health and hence happiness. Likewise, urban conditions can foster social relations which on their turn add to happiness. Several such social mediators have been identified in the study of Hogan et al (2016).

If a mediating variable is involved, control for that variable will result in a lower correlation. For example, if living close to a public transport hub adds to income chances and through higher income to greater happiness, control for income will reduce the correlation between availability of public transport and happiness. Looking at the control variables in Table 6 from this perspective, we see no variables that are likely to have functioned in this way, at best satisfaction with the city can have fostered social cohesion which on its turn raised happiness. As yet, this is an unexplored territory.

5 Discussion

5.1 What we know

5.1.1 Objective characteristics of residential environment

The observed correlations between happiness and objectively assessed characteristics of the urban environment are typically small, with the exception of basic amenities, such water supply and sewage. Small negative correlations were found with closeness to *amenities* and *connectivity*. *Compactness* of the city and *diversity of land use* also related

negatively to happiness of its inhabitants. Positive correlations were found with proximity to *green spaces* and with access to *public goods and services*.

5.1.2 Subjectively perceived characteristics of urban environment

The observed correlations are stronger in this case. Happiness correlates negatively with perceived *access to shops* in vicinity, *sewage* and *maintenance* of streets and buildings. On the other hand, happiness was found to be positively correlated with *perceived beauty* of the city and *neatness* of the neighborhood.

5.1.3 Satisfaction with aspects of the urban environment

Happiness appeared to be positively related to satisfaction with various aspects of the urban environment. The correlations were mostly strong and strongest for satisfaction with the basic utility of *water supply*, satisfaction with *connectivity* and *overall satisfaction* with the neighborhood.

5.1.4 Objective/subjective paradox

A main finding is that happiness relates negatively to objectively assessed closeness to several amenities and travel facilities, while happiness relates positively to subjective perceptions of the same. Remember Table 2. We explore possible explanations for that paradox below in Sect. 5.3.

5.2 What we do not know

Part of what we do not know is visualized in the many blanks in the tables. Not visible are the many aspects of urban environments of which the relation with happiness has not been investigated as yet, and do not figure in any of the tables for that reason. It would lead too far to enumerate all possible urban determinants of happiness that escaped the research eye so far. Some illustrative cases are: the complexity of the urban map, the variety of building styles within and across quarters of the city and the number of public places.

This brings us to a main lack in the available evidence. The findings reviewed are mainly about the relation of happiness with the *residential* environment and do not inform us about the effect on happiness of more remote urban characteristics, such as squares and impressive architecture in the city center. Do such urban features affect the happiness of citizens, most of which visit such places only incidentally? Note that only a few such city level characteristics appeared in Table 2 only under the heading of *urban design*.

As noted in Sect. 4.6, there is as yet little view on the causal mechanism behind the observed statistical correlations.

5.3 Is there an objective/subjective paradox?

In Table 2c we presented findings on the correlation of happiness with the same aspect of urban environment obtained with two measures of these aspects, objective indicators and

subjective perceptions. Objectively assessed access to amenities and travel was negatively associated with happiness, while subjective perceptions of the same related positively to happiness. How can that be?

5.3.1 Why less happy when living near urban amenities and travel hubs?

One reason could be in the urban character of such environments and explanations along this line can draw on a large literature on disadvantage of city life, such as its hectic, anonymity and crime (e.g., Okilicz-Kozarin, 2015). This view is supported by the negative correlations in Table 2 with traffic intensity in the vicinity and living close to the city center.

Another explanation is selective settlement, unhappy people being more inclined to live near that urban turmoil. This can be due to economic necessity, as was typically the case in American cities in the late twentieth century, where a ring of deprived areas used to surround booming down-town and the low housing prices attracted disadvantaged people. This explanation of 'urban decline' did not apply here, since most of the partial correlations reported in Table 2 controlled for income, so the lower happiness of people living near the city center was not due to their poverty.

Selective settlement can also result from social reasons, such as singles doing better in the inner city than in a sub-urban quarter. In this case, their residential choice can add to their own happiness, while it depresses average happiness in the neighborhood, singles being typically less happy than the marrieds. In this context, we inspected whether family status had been used as a control variable. The study by Ferre et al. (2010) in Montevideo controlled the correlation of happiness with closeness to the city center for having a partner and family size and found no effect. This can mean that the negative correlation was spurious but this study involved many more control variables which are likely to have erased any correlation with happiness anyway. Hart et al. (2018) controlled the relation between happiness and local traffic density for presence of children in the household and still found a significant negative correlation. These few findings cannot settle the issue.

5.3.2 Why nevertheless a positive correlation with subjective perceptions of the same?

There are several methodical explanations for this paradox. One such explanation is that the questions on access to amenities and transportation typically involve adherence to statements, such as 'I have easy access to.'. 'Easy access' is not quite the same as 'closeness to'. It is also possible that the correlation is driven by effects of happiness. Happy people could estimate distances earlier as 'easy' because they are typically more energetic. Happiness can also affect the correlation by mere coloring of perception, happy people tending to see the positive side of things. This 'top-down' effect is particularly strong when the object of perception is ill defined, such as in this case the 'ease' of access.

In these views, there is no real paradox but is the difference a matter of biased measurement. If so, that bias is likely to be involved in the marketing studies on citizen's perceptions and satisfactions that are commonly used in urban planning.

However, a more substantive explanation could be that subjective perceptions capture more aspects of access and connectivity than objective indicators such as the distance in meters. One such aspect could be the ease of finding one's way to the amenities. In this view, subjective perceptions tell more.

5.4 Why we know so little

The now available data do not make us much wiser about what urban settings provide the greatest happiness for the greatest number of residents. That knowledge lack is surprising, given the huge investments involved in the building and restructuring of cities. One reason for this dearth seems to be that city planners prefer to follow their own gut feelings and don't like to see these contested by scientific data about effect on happiness. Another reason can be that, if they orient on data, they look at data on what urban conditions people expect to add to their happiness, such as those gathered by MacKerron and Mourato (2013), Toger et al., (2021), Kang et al. (2021), Florida et al. (2013) and Hogan et al. (2016). Yet what people *think* that will make them happy does not always really *make* them happy. As noted in Sect. 2.1, a basic insight from happiness economics is that 'expected utility' is not always matched by 'experienced utility' (Kahneman et al., 1997).

In this context a main task of research is to bring 'misperceptions of utility' to the light, which has not been done in this field as yet. This difference between what people think/like and what actually works is well recognized in medical research and is also acknowledged in research on healthy cities. Yet in the search for happy cities that distinction has not yet landed, probably because happiness is seen as cognitive contentment and as such overlaps with what people think that will make them happy and like. The knowledge deficit is not only due to lack of data but also to a lack of conceptual clarity.

5.5 Future research

Future research on the relationship between urban environment and happiness should prioritize the following kinds of studies:

- Experimental studies are the best way to establish a causal effect of urban environment on the happiness of people who live there. In this synthesis of the available research we did not find any experimental study. Obviously, it is difficult to organize an experiment in which an experimental group is subjected to a change in urban environment. Still, natural experiments are well possible, such as in the case of relocation following urban renewal.
- Once we can establish causal effects, we can further grasp for the underlying mechanisms, in other words on the *mediators*. In this paper we could only speculate about that, such as in our discussion in Sect. 4.6.
- The findings reported in this paper pertain to the average resident in urban areas. This may suffice for policy makers who aim at happiness for the greatest number but individuals pondering where to settle in a city will want to know how urban environments work out on their kind of people. For example, does the observed negative effect of living near the city center also apply for youngsters and singles? This requires more research on the *moderators* in the relationship between urban environment and happiness.
- The findings reported in this research synthesis pertain mainly to residential areas. Only a few characteristics of the more remote urban environment have been considered. See Sect. 4.1.1 on compactness of the city center and Sect. 4.1.2 on perceived beauty of the city. Urban designers will also want to know whether squares, public parks and iconic architecture affects the happiness of urbanites.

6 Conclusions

There is little ground for conclusions, this strand of research is still in its infancy. As yet we lack solid data about what urban environments give the greatest happiness for the greatest number of citizens. Hence, current claims about 'happy cities' are mere speculation.

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Link to study descriptions in the World Database of Happiness are added to the publications from which findings were taken for this research synthesis.

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