



DIE ERDE

Journal of the  
Geographical Society  
of Berlin

# Places of well-being in a French region. Lyon residents and their preferences

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Manuscript submitted: 20 December 2020 / Accepted for publication: 29 June 2021 / Published online: 14 October 2021

## Abstract

*This paper seeks to reveal the key territorial components of people's well-being. To this end, a method that makes it possible to (1) identify the components that potentially constitute well-being within a given territory and (2) determine, on the basis of individuals' reported preferences, those areas that are most or least likely to meet these individuals' needs has been developed and used. It reveals that natural amenities, access to health services, and safety are the most important factors for Lyon residents' well-being. Taking as our starting point the preferred territorial components of Lyon residents, we identify the areas where their well-being would be greatest.*

## Zusammenfassung

In diesem Beitrag wird versucht, die wichtigsten territorialen Komponenten des Wohlbefindens von Menschen zu ermitteln. Zu diesem Zweck wurde eine Methode entwickelt und angewandt, die es ermöglicht, (1) die Komponenten zu ermitteln, die das Wohlbefinden in einem bestimmten Gebiet ausmachen können, und (2) auf der Grundlage der von den Personen angegebenen Präferenzen die Gebiete zu bestimmen, die die Bedürfnisse dieser Personen am ehesten oder am wenigsten erfüllen. Dabei zeigt sich, dass die natürlichen Gegebenheiten, der Zugang zu Gesundheitsdiensten und die Sicherheit die wichtigsten Faktoren für das Wohlbefinden der Einwohner von Lyon sind. Ausgehend von den von den Einwohnern Lyons bevorzugten territorialen Komponenten ermitteln wir die Gebiete, in denen ihr Wohlbefinden am größten wäre.

**Keywords** well-being, preferences, rural area, urban area, Lyon

Lise Bourdeau-Lepage, Kenji Fujiki 2021: Places of well-being in a French region. Lyon residents and their preferences. – DIE ERDE 152 (3): 184-199



DOI:10.12854/erde-2021-548

### 1. Introduction

In recent years, there has been a proliferation of studies on well-being – so much so that it can sometimes be difficult to find one's way among the profusion of publications. It can be done, however, by characterizing authors' approaches to well-being. Well-being can be subjective, objective, eudaemonic, hedonic, universalist, contextualized or capabilist (Maslow 1943; Andrews et al. 1976; Cantril 1965; Bailly 1981; Sen 1985a; Kahneman et al. 2004; Cooke et al. 2007; Nascimento et al. 2008; Cox et al. 2010; Bigot et al. 2012; OECD 2013, 2014; Nordbakke and Schwanen 2014; Ville de Toronto 2014). It can be measured using indicators such as the Human Development Index (HDI), developed from the work of Amartya Sen (PNUD 1990, 2010), or the HDI-2, developed more recently on a smaller scale, across *communes* (municipalities) in the Paris-Île-de-France region (IAU-ÎdF 2014), or indeed using the spatialized capabilist index of well-being devised by Bourdeau-Lepage and Tovar (2011) and Tovar and Bourdeau-Lepage (2013). Individuals' levels of well-being can also be gauged via surveys (Cantril 1965; Diener et al. 2010; Diener 1984). In these cases, however, differences between individuals and places are highlighted without seeking to explain them.

And yet it is possible to explain sociospatial disparities in well-being. To do so requires us to recognize, first, that individuals' preferences vary in terms of the different components that lead to well-being, and then develop a method that highlights the most or least conducive spaces for an individual or group of individuals on the basis of these preferences. It should be noted that this hypothesis concerning the diversity of factors that determine individuals' well-being is not taken into account in all well-being studies. For example, while the work of the Spiral project (Societal Progress Indicators for the Responsibility of All) involves developing a method based on co-construction to determine well-being and the components that contribute to it<sup>1</sup> (Consiel de l'Europe 2005), this project focuses on populations and not on individuals. This means that the diversity of individuals' preferences is not revealed.

If we assume that preferences regarding components of well-being vary among individuals, it is then simply necessary to specify the components that potentially constitute well-being across a given area and look at whether they are present or absent in the area studied. This makes it possible to produce an initial analy-

sis of disparities in well-being, based on individuals' statements, and makes it possible to observe whether there are places that are more conducive to well-being than others.

Our approach to well-being is thus focused on territories and their features. As a first step, potential territorial components for individuals' well-being are identified using the current literature on well-being. As our prime interest lies in the territory, it should be noted that here we have not adopted a normative approach to well-being focused strictly on individuals, as is the case for instance in the operationalization of Sen's works with the CAS index (Tovar and Bourdeau-Lepage 2013) or the Human Development Index (PNUD 1990, 2010). The second step involves a survey that takes as its starting point the complete set of territorial components that were identified as potentially important for individuals' well-being. The aim of this survey is to reveal the needs and the most important components of well-being of a targeted population. On the basis of individuals' reported preferences, we then determine which areas are most or least likely to meet these individuals' needs.

In applying this procedure, we will seek in this paper to reveal the preferences of Lyon residents in terms of the key components of their well-being, before determining which spaces within the former Rhône-Alpes region<sup>2</sup> would potentially offer these city dwellers the highest levels of well-being. We will demonstrate that natural amenities, accessibility to health services, and safety are the primary components of well-being for residents of the 6<sup>th</sup> *arrondissement* and the northern part of the 7<sup>th</sup> *arrondissement* of Lyon<sup>3</sup>. Then, by projecting the preferences of these Lyon residents on to the wider Rhône-Alpes region, we will reveal a highly specific geography of potential well-being. This will lead us to conclude that the inhabitants of a large French city aspire to a life in a rural setting.

### 2 Methodology: a set of components of well-being and an "alternative" multiple-criteria analysis method

The aim of this section is to present the multiple-criteria method employed to aid decision-making, while highlighting the factors that guided our choices. Our conceptual approach can be broken down into three steps. First, we shall define the list of criteria we presented to respondents during the survey. Second, we

shall present the method we used to record respondents' preferences in terms of the components that constitute their well-being. We chose to present this set of components to respondents using a set of flashcards that we designed and created. Lastly, we shall present the different stages of our multiple-criteria analysis method.

## 2.1 Defining the set of components of well-being for respondents in a given area

In order to define the set of components that potentially constitute individuals' well-being, we made use of criteria employed in the studies on well-being cited in the introduction. We also referred to works focusing on the location choices made by individuals and on the attractiveness of different geographical areas; we made use of findings from the field of urban economics; and we sought to take into consideration the role played by freedom and opportunities in determining individuals' well-being (*Sen* 1985a,b). In line with works on territorial attractiveness, we considered that the quality of life on offer in a given area was dependent on the amenities available there (*Moonen et al.* 2015; *Gollain* 2015) and on individuals' preferences (*Bourdeau-Lepage* 2015). In this way, a given geographical area provides different levels of well-being for different individuals. The question then is how to determine the range of amenities that individuals may or may not value in their search for well-being. It should be borne in mind that each amenity selected must lend itself to being transformed into a statistical indicator that can be georeferenced to a particular *commune* so as to enable the spatial projection of preferences at the next stage. Taking inspiration from the works of *Brueckner et al.* (1999) and those of *Huriot and Bourdeau-Lepage* (2009) in particular, we divided amenities into three broad categories: historical amenities (also referred to as urban amenities), natural (or green) amenities, and social amenities.

### 2.1.1 Historical amenities

One of the first things we learn from works in the field of urban economics (*Wingo* 1961; *Alonso* 1964; *Muth* 1969; *Mills* 1972) is that individuals choose their residential location by weighing up the cost of transport into the city centre and the cost of housing, including land costs. Access to the workplace is also an important component of their well-being. We therefore in-

cluded the following criteria: proximity to one's workplace, access to qualified jobs in the area, and access to unqualified jobs in the area. We also needed to take account of the stability of local employment and the salaries available in the area, as these factors can have an effect on the overall level of well-being: when employment is not stable, the resultant lack of economic security can generate stress (*Moulin et al.* 2009), specific pathologies, and ill-being (*Stiglitz et al.* 2009); and the question of salaries is necessarily linked to the relationship between people's income and their level of well-being (*Kahneman and Krueger* 2006; *Campbell et al.* 1976; *Stevenson and Wolfers* 2013).

With respect to housing, surveys report that French people typically wish to live in a house with a garden (*Sallez and Coutrot* 2009). The presence of detached, single-family homes in a given area would therefore seem an important factor to take into consideration. We have done this using an indicator for housing quality.

Individuals' well-being also depends on their ability to satisfy their day-to-day needs (*Maslow* 1943, 1954). For example, a certain number of local services and amenities are necessary for optimum well-being. Prime among these are: personal and family assistance services, medical facilities and doctors, cultural and sporting amenities, bars and restaurants, shops and repair services, and schools. We have included these in the set of components that potentially constitute well-being. Furthermore, good access to transport networks is essential, and likewise high-quality telephone and internet connections are today major factors in terms of access to services (*Crédoc* 2016). Nowadays, populations are restrained in terms of opportunities when they lack access to internet – in particular social networks – and/or to telephone networks. Such restrictions may have multiple impacts: on job searches, teleworking opportunities, access to information and the ability to exchange information and knowledge, maintaining social ties despite geographic distance, access to health, administrative services, formations, etc. Some of these effects are cumulative. For instance, if a person is unable to undertake training via online courses, their opportunities will be reduced: with a lower level of qualification than others who are able to complete their training online, this person will have less chance of being hired (*Un-édic* 2019). In many cases, a lack of access to internet will lead to fewer opportunities and a lower level of well-being.

These last two factors are highly sought after by individuals (*Fijalkow and Jalaudin 2012*), as is the accessibility of their home and neighbourhood (*Table 1*). Individuals also care about the image of the place where they live (*Maslow 1954*). They will feel good about the space they inhabit if it enjoys a positive image. We have included this factor as a component of the heritage capital of the local area (*Table 1*). Other factors are also important for well-being, particularly amenities linked to the physical environment, which we have called natural amenities, so as to avoid any confusion with factors relating to the social environment.

### 2.1.2 Natural amenities

Nature plays an important role in individuals' well-being (*Matsuoka and Kaplan 2008; White et al. 2013*). The mere presence of nature can have therapeutic virtues, in particular by reducing levels of stress and mental fatigue (*Kaplan and Kaplan 1989; Sheets and Manzer 1991; De Vries and Verheij 2003; Antonelli et al. 2019*). Scientific studies reveal, for example, that a close relationship exists between a person's state of health and proximity to natural elements such as a waterway, park or garden. Certain landscapes can even be therapeutic (*Gesler 1992; Ulrich 1984; Kuo and Taylor 2004*). The view of such landscapes alone can reduce anxiety (e.g. *Rubin et al. 2003; Ryan et al. 2014*). Nature also seems to help reduce feelings of loneliness (*Maas and Van Dillen 2009*), and the presence of flowers, trees and shrubs would appear to help individuals to relax and recharge their batteries (*Schroeder and Lewis 1991*). Likewise, climate is known to impact individuals' well-being. It plays a significant role in the relationship with others (*Cunningham 1979; Rind and Strohmetz 2001*). While climate can and should be integrated into international comparisons, or in comparisons between large regions, it would not be relevant to include this criterion in our study, inasmuch as it involves measuring well-being at a municipal scale, in a single region. Climatic variability cannot be evaluated on such a local scale.

Works and studies focusing on individuals' aspirations (e.g. *Unep-Ipsos 2013; Schmitz 2001; Crédoc 2016, 2017*) also provide some interesting contributions. They tell us in particular that, today, individuals' demand for nature is high. For 55.7% of respondents surveyed in Lyon in 2012, nature represented a vital need (*Bourdeau-Lepage et al. 2012*). Nature also represents an aspiration for French people more gen-

erally, as 70% of the population say that they wish to live close to a green space (*Unep-Ipsos 2013*). But, above all, nature is a source of well-being. A study of 5,000 English respondents showed that city dwellers living in places where there are more green spaces than elsewhere reported higher levels of well-being than other urbanites (*White et al. 2013*).

We have therefore included five criteria to reflect this key element of well-being and to take account of individuals' varying sensitivity to natural factors. The first criterion is natural landscapes as we know that they can have a positive effect on an individual's well-being simply through visual contact. The next three criteria are: a healthy, pollution-free environment; protection against natural and technological risks; and the protection and enhancement of natural spaces. Living in a healthy and protected environment has a beneficial effect on individuals, as it is something that makes people feel good. A healthy and protected environment also necessarily prevents the risk of potential trauma resulting from natural disasters (*Dolinski et al. 1987*). Lastly, we added the criterion of access to natural spaces for leisure purposes, as individuals aspire to this form of contact with nature, and experience a sense of well-being when they visit these kinds of spaces (*Bourdeau-Lepage 2019*).

### 2.1.3 Social amenities

Well-being is also dependent on social amenities. We know that social diversity can contribute positively to well-being, as shown, for example, by the works of *Tovar (2008)*. For instance, an individual's ability to implement varied life trajectories and seize the opportunities that present themselves is greater when the individual in question lives in a diversified day-to-day environment. Consequently, social diversity can be a factor that fosters an improvement in well-being (*Pinçon. and Pinçon-Charlot 2010*). We therefore chose to add a criterion to assess the diversity of the social fabric. This indicator reflects the diversity of professions of individuals working or living in a given area (*Table 1*).

Table 1 Set of potential components of well-being. Source: own elaboration

	Components of well-being (CWB <sub>k</sub> )	Statistical indicators (SI <sub>k</sub> )	Data source
Historical amenities	Proximity to one's workplace	Proportion of the population in employment that works in their <i>commune</i> or <i>arrondissement</i> of residence	INSEE – RP 2013
	Type 1 jobs	Percentage of residents with at least two years of higher education (i.e. after the <i>baccalauréat</i> high-school diploma) who are in employment	INSEE – RP 2013
	Type 2 jobs	Percentage of unqualified residents (with no qualifications or the <i>brevet</i> diploma taken at age 14/15) who are in employment	INSEE – RP 2013
	Stability of employment in the area considered	Percentage of residents in permanent salaried employment who work in a <i>commune</i> less than 20 minutes away by car	INSEE – RP 2011
	Salaries on offer in the area considered	Median annual gross salary weighted by socio-professional category (by workplace) on the scale of employment areas ( <i>zones d'emploi</i> )	INSEE – DADS 2013
	Housing quality	Percentage of individual dwellings (primary residences)	INSEE – RP 2013
	Access to cultural and sporting amenities	Number of cultural and sporting amenities per 1,000 residents located less than 20 minutes away by car	INSEE – BPE 2015
	Access to personal and family assistance services	Number of assistance services per 1,000 residents located less than 20 minutes away by car	INSEE – BPE 2015
	Access to health services	Number of family doctors and pharmacies per 1,000 residents located less than 20 minutes away by car	INSEE – BPE 2015
	Access to bars and restaurants	Number of catering establishments per 1,000 residents located less than 20 minutes away by car	INSEE – BPE 2015
	Access to shops and repairers	Number of shops per 1,000 residents located less than 20 minutes away by car	INSEE – BPE 2015
	Access to schools	Number of nursery and primary (elementary) schools per 1,000 residents located less than 20 minutes away by car	INSEE – BPE 2015
	Good-quality Internet and telephone network coverage	Access to broadband Internet and 4G mobile data within a 20-minute radius	ANF (Agence Nationale des Fréquences) 2014
	Accessibility of the area concerned	Presence of a motorway junction and an SNCF railway station within a 20-minute radius	IGN 2017, SNCF 2017
	Local heritage	Presence within the <i>commune</i> of a listed building/monument or a conservation area	Ministère de la Culture 2017
Natural amenities	Natural landscape	Percentage of the <i>commune</i> 's total area occupied by natural vegetation	Corine Land Cover 2012
	Healthy and pollution-free environment	Percentage of land within a 5 km radius occupied by negative amenities	Corine Land Cover 2012
	Protection against natural and technological risks	Existence of natural and industrial risk-prevention plans (PPRNs and PPRIs in French) that cover the <i>commune</i>	DREAL Auvergne–Rhône-Alpes 2017
	Protection and enhancement of natural spaces	Existence of a protected natural space within the <i>commune</i>	DREAL Auvergne–Rhône-Alpes / INPN 2017
	Access to natural leisure spaces	Percentage of land occupied by forests (of at least 10 km <sup>2</sup> ) and lakes located less than 20 minutes away by car	Corine Land Cover 2012

	Components of well-being (CWB <sub>k</sub> )	Statistical indicators (SI <sub>k</sub> )	Data source
Social amenities	Level of safety	Number of reports of crimes against persons or property per 1,000 residents in the relevant police/ <i>gendarmerie</i> sector	ONDRP 2012
	Diversity of residents' professions	Average of Theil's <i>T</i> and <i>L</i> indices (measuring economic inequality) for the different socio-professional categories present in the <i>commune</i> in the daytime and at night-time	INSEE – RP 2011
	Communal spaces where people can get together and participate in group activities	Number of public spaces per 1,000 residents located less than 20 minutes away by car	IGN 2017
	Associations and clubs where people can get involved and meet other people	Number of associations created between 2011 and 2016 per 1,000 residents located less than 20 minutes away by car	JOAFE 2017
	Local events, markets, jumble sales, etc.	Number of events occurring in 2016 per 1,000 residents located less than 20 minutes away by car	<a href="https://openagenda.com">https://openagenda.com</a> 2017
	Decision-making and participation in local development projects	Turnout in the first round of the municipal elections held in 2014	Ministère de l'Intérieur 2014
	Likelihood of meeting a life partner in the area concerned	Number of men per 100 women aged over 20 living in <i>communes</i> located less than 20 minutes away by car	INSEE – RP 2013
	Affluence of residents	Median annual income per consumption unit ( <i>unité de consommation</i> defined by INSEE)	INSEE – FILOSOFI 2013
	Education level	Average qualification level weighted to reflect the age structure of the <i>commune</i> (dimensionless indicator)	INSEE – RP 2011

Social relations are also a component of well-being – after all, are humans not characterized by their gregarious nature? These relations occur in places such as village squares (Sack 1997) or within specific organizations. The presence of communal spaces, associations and clubs, the organization of local events of all kinds, and the possibility of participating in local development projects are all potential determining factors of well-being (Table 1). Following on from the works of Maslow (1954, 1943), it also seems important to add a criterion that reflects the need for love as a component of well-being. For this, we chose as a potential component of well-being the likelihood of meeting a life partner in the local area, which we evaluated by considering the number of men per 100 women aged over 20 living in *communes* located less than 20 minutes away by car from the *commune* in question.

These various criteria are complemented by three others, recognized as classic indicators for evaluating social amenities. The first is the affluence of residents of the *commune* in question, while the second is the level of education of the local population (Table 1). We also know that if individuals feel safe, their sense of well-being will be greater (Maslow 1954). With this in mind, the level of safety is the third criterion to be taken into consideration, and the last of our set of components of well-being (Jeannic 2006; Table 1).

## 2.2 Recording individuals' preferences: flashcards and multiple-criteria analysis

In order to identify and record the most important components of well-being from among the 29 criteria presented above, we used a set of flashcards in conjunction with a multiple-criteria decision analysis method.

### 2.2.1 The set of 29 flashcards

The set of flashcards offers certain proven advantages (Texier 2009). For example, there is a fun aspect to flashcards that encourages people to respond to the questionnaire. It facilitates comprehension by making the proposed criteria more tangible and relatable, and increases the number of people who are able to reply to the questionnaire. Using flashcards reduces both the time necessary to complete the questionnaire and the risk of placing people in a stressful situation. It also means that all the cards can be displayed at once, thus providing a clear, overarching vision of the set of possible components. This also avoids having to read out a list of 29 criteria for respondents to choose from.

The flashcard method also has a number of disadvantages, however, which we therefore sought to minimize. The most significant of these lies in the researcher's subjectivity in choosing illustrations for each flashcard. To avoid orientating or influencing responses, we decided to use simple, stereotypical pictograms as illustrations. To ensure a high level of homogeneity between cards, a number of rules of graphic semiology were applied (Bertin 1967). For example, we used the same motif for similar concepts, ensured uniform shades of colour were used, chose low levels of contrast and curves instead of straight lines, etc. We added a caption at the bottom of each card in order to minimize potential ambiguity, and to facilitate the task of retranscribing the responses. At the end of this design process, each of the 29 criteria (or components of well-being: CWBs) was represented by a flashcard (Fig. 1).

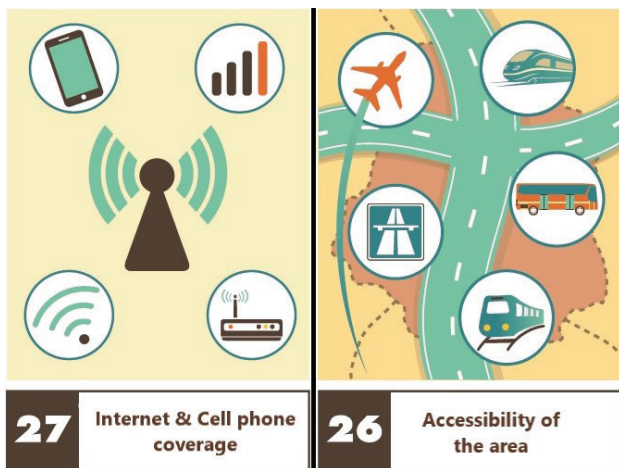


Fig. 1 Examples from the set of flashcards. Source: own drawings

Once the set of flashcards had been produced, we had to choose a means of recording which CWBs were considered most important by each respondent. This method was to be selected from the set of existing decision-making assistance methods. It should be borne in mind that we also wished to ascertain the importance of each CWB for each individual.

### 2.2.2 An “alternative” multiple-criteria analysis method

The factors that determine well-being were recorded with the aid of a five-part questionnaire<sup>4</sup>, one part of which is devoted to noting these factors. This part of the questionnaire is titled “Preferences and local

amenities” and is broken down into three steps. First of all, respondents are invited to select ten flashcards from the set of 29 cards representing components of well-being  $CWB_k$  ( $k = 1 \dots 29$ ), which are presented on a board in front of them. These ten cards should represent the ten most important components for well-being  $CWB_k$  – i.e. those factors which, in the respondents’ view, should be present before all others in a given geographical area if it is to provide the highest possible level of well-being.<sup>5</sup> Consequently, each individual  $i$  ( $i = 1, \dots, n$ ) selects ten of the 29 flashcards  $CWB_{ki}$  with  $k = 1, \dots, 29$ . The respondent then ranks the 10 selected flashcards  $CWB_{ki}$  from most to least important:

$$CWB_{ki1} > CWB_{ki2} > \dots > CWB_{ki10} \quad (1)$$

where  $CWB_{ki1}$  represents the card ranked first;  $CWB_{ki2}$  the second;  $CWB_{ki3}$  the third, etc.

Lastly, we gave respondents 100 tokens representing their level of well-being. Each respondent was then asked to distribute these 100 tokens among the ten selected flashcards, following the ranking established in the previous step. In distributing these 100 tokens, each individual  $i$  ( $i = 1, \dots, n$ ) thus provides a weighting  $p_i$  for the selected components, denoted as follows:

$$p_i CWB_{ki1} + p_i CWB_{ki2} + \dots + p_i CWB_{ki10} = 100 \quad (2)$$

As we have demonstrated, the method we chose to implement is a multiple-criteria decision analysis method with full aggregation. We presupposed that all judgements were quantifiable. Our choice of method was justified by a number of factors. First, we needed a method that would produce a weighted ranking for all the criteria in the set of flashcards (our panel of components that potentially constitute well-being). We also needed a method that could be implemented in public spaces for any individual, using simple apparatus. A review of the literature on existing multiple-criteria analysis methods did not reveal a method that was truly adapted to the object and aims of our study (Roy and Bertier 1971; Roy 1985; Roy and Bouyssou 1993; Saaty 1980; Schärli 1996; Paelinck 1978; Mena 2000). We could have used multiple-criteria decision analysis methods with partial aggregation (Schärli 1985), also known as outranking methods (Roy 1985). These methods enable the comparison of criteria taken two at a time, to determine whether one criterion outranks the other. These comparisons are then summarized in order to establish a ranking of the criteria (Siskos et al. 1983). This kind of method results in very

time-consuming questionnaires, and is tedious to implement for both respondent and interviewer. It was not possible to use a method of this sort in our case. Moreover, outranking methods place weighting choices in the hands of the researcher to a certain extent. We wanted to avoid this type of bias. We felt that allowing respondents to establish their own weightings minimized any bias and matched our objectives perfectly. We wanted to find out which components determined individuals' well-being on the basis of their own declarations, with as little interference from us as possible. We therefore chose a multiple-criteria analysis method with full aggregation.

### 3. Environmental, social, and health-related safety: a major component of Lyon residents' well-being

We presented this set of potential components of well-being to a representative sample in terms of age and gender of the population of the 6<sup>th</sup> and 7<sup>th</sup> *arrondissements* (city districts) of Lyon (*Bourdeau-Lepage and Texier 2017*). We chose these two central districts as they are sociologically different, thus reducing biases concerning the socio-economic profile of the sample. The 6<sup>th</sup> *arrondissement* attracts a young population of highly qualified workers with very high incomes, has a relatively low unemployment rate, and boasts a major natural amenity: the Parc de la Tête d'Or, a large urban park. This is a privileged neighborhood. The 7<sup>th</sup> *arrondissement* is historically a working-class neighborhood which has experienced a social reconfiguration, with incomes below the Lyon average. This neighborhood today attracts a young and educated population.

The surveys took place between 27 March 2017 and 7 April 2017, which happened to coincide with very sunny weather. During this period, eight people (researchers and investigators) roamed the streets of these two *arrondissements* and interviewed 120 people in each, making a total of 240 respondents. These interviews were conducted using the questionnaire which has four sections, one of which focuses on the respondent's profile, and one of which focuses on well-being. On average, each questionnaire took 15 minutes to complete.

The choices expressed by the Lyon residents interviewed regarding components of well-being reveal very marked preferences. Nine flashcards alone ac-

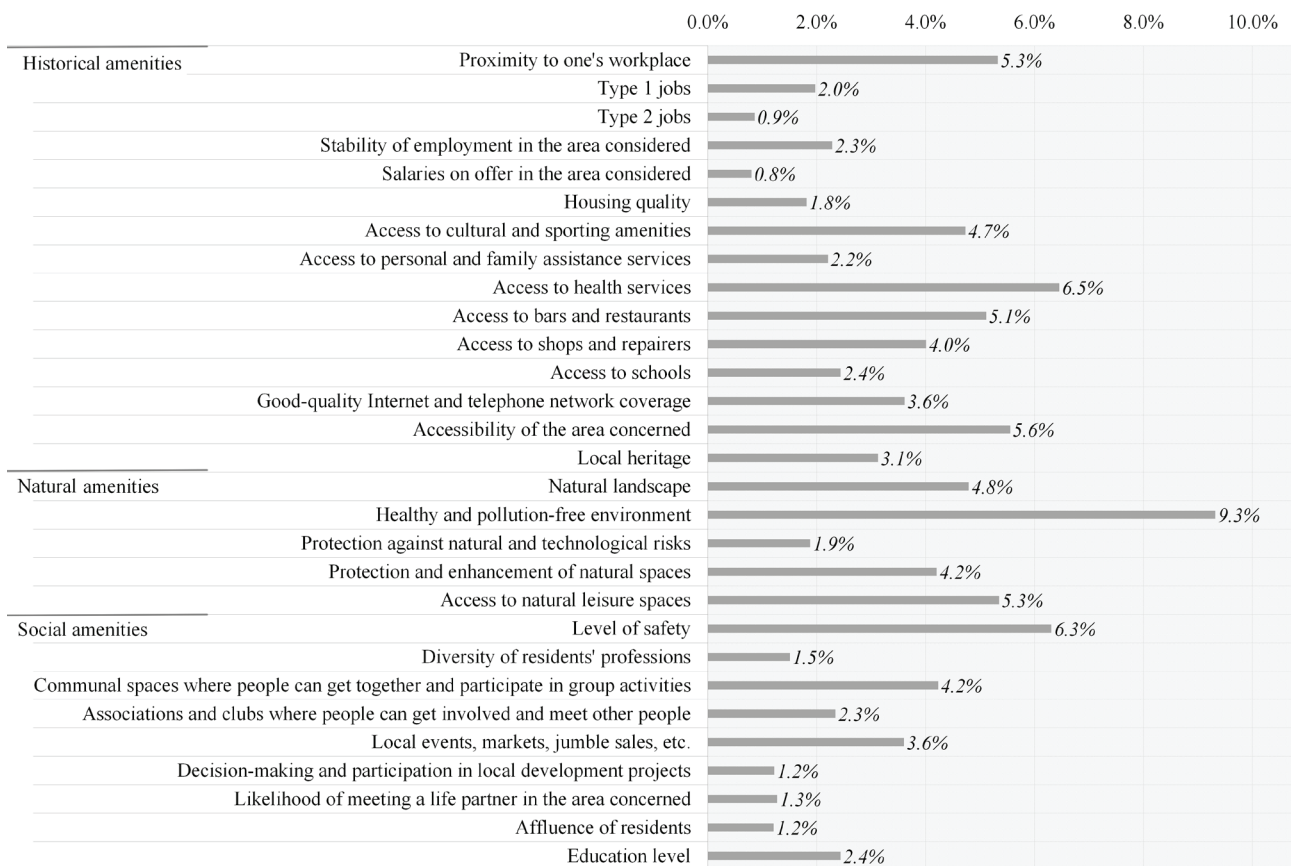
counted for more than half of all the points awarded by respondents (*Fig. 2*), who expressed a clear preference for natural amenities. While the flashcard set includes only five cards corresponding to amenities of this type (about 17% of the total), they represented more than 25% of expressed preferences. Three components appear to be particularly highly valued: the natural landscape (4.8%), access to natural leisure spaces (5.3%), and, above all, a healthy and pollution-free environment (9.3%). Well-being is therefore appreciated in terms of both the absence of negative amenities and the presence of positive amenities, in an urban context where environmental pollution – we may suppose – is felt particularly keenly.

Conversely, social amenities seem to be considered relatively unimportant by Lyon residents (31% of flashcards but only 24% of expressed preferences). The diversity of employment opportunities (1.5%), the likelihood of meeting a romantic partner (1.3%), participation in local development projects (1.2%) and the affluence of residents (1.1%) are components that are particularly undervalued in terms of well-being. However, one key exception is safety (6.3%). Components relating to the accessibility of social amenities – public spaces (4.2%) and local events (3.6%) – are also relatively highly valued.

The representation of historical amenities is more balanced (50% of points awarded for 52% of the flashcards); however, there are striking disparities. Amenities with an economic dimension are undervalued, such as jobs (type 1: 2.0%, type 2: 0.9%), employment stability (2.3%), the wages on offer in the area (0.8%), and the quality of housing (1.8%). On the other hand, and in line with what was observed for social amenities, Lyon residents expressed their preference for certain components relating to accessibility: the overall accessibility of the local area (5.6%), as well as access to health services (6.5%), bars and restaurants (5.1%), cultural and sporting amenities (4.7%), and shops (4.0%). Proximity to one's workplace is also appreciated (5.3%). Good-quality internet and mobile-phone coverage represent only 3.6% of expressed preferences. This component seems less important for Lyon residents than for rural inhabitants of the Rhône-Alpes region. Indeed, in rural areas, good-quality internet and mobile-phone coverage is highly valued – 6.5% of expressed preferences (*Bourdeau-Lepage 2020*). This difference is understandable, as urban populations already have good access to internet, and as a digital gap can be observed within the region.



## Places of well-being in a French region. Lyon residents and their preferences



*Interpretation of the grouped bar graph:* This graph shows the number of points awarded to each of the 29 flashcards [representing the 29 key components of well-being (CWBs)] by the 240 Lyon residents interviewed, expressed as a percentage of the total number of points. From top to bottom: historical amenities, then natural amenities, and finally social amenities. So, for example, the flashcard for "a healthy and pollution-free environment" received the most points, namely 9.33% of all the points awarded by the 240 respondents.

Fig. 2 Preferences, in terms of components of well-being, of residents of the 6th and 7th arrondissements of Lyon (March to April 2017). Source: own elaboration

In view of the preferences in terms of amenities – particularly natural amenities – expressed by Lyon residents, one might wonder whether, in principle, these city dwellers would not enjoy a higher level of well-being in other areas of the Rhône-Alpes region.

#### 4. The eastern and south-western fringes of the Rhône-Alpes region: places of potential well-being for Lyon residents

To answer this question, we need to identify those *communes* in the Rhône-Alpes region that offer the preferred components of well-being, as expressed by the 240 Lyon residents interviewed.

#### 4.1 Identifying the most attractive territories for city dwellers: methodological elements

In order to determine the most and least favourable areas for the 240 respondents, we projected all their preferences on to the 2,843 *communes* of the Rhône-Alpes region. This was done using the following procedure:

On the one hand, for each survey respondent (identified by the notation  $i$ , where  $i = 1$  to 240), we know the weighting of each potential component of well-being, denoted by  $CWB_k$  ( $k = 1, \dots, 29$ ) (Eq. 2). For each component, we can thus compute  $P_k$  the average of the individual weightings  $p_i CWB_{ki}$ , with  $n$  being the sample size:

$$P_k = \frac{\sum_{i=1}^n p_i CWB_{ki}}{n} \quad (3)$$

This allows us to obtain the total weighting of each component (*i.e.* each flashcard) assigned collectively by the 240 respondents (in other words, the expressed preferences of the average respondent).

On the other hand, for each of the 29 potential components of well-being, we have a statistical indicator, denoted by *SI* (see *Table 1*) and available for each *commune* of the Rhône-Alpes region (*communes* are identified by the notation *j*). To ensure the 29 indicators are mutually comparable, a standardization method was applied.

Lastly, a potential well-being index (WBI) was calculated for the average respondent in each of the *communes*. This involves a weighted average of the statistical indicators whose weighting corresponds to the average weight assigned to each of the 29 components (Eq. 3). This weighted average is calculated as follows:

$$WBI_j = \sum_{k=1}^{29} P_k SI_{kj} \quad (4)$$

By following this method, the potential well-being index *WBI<sub>j</sub>* of each of the 2,843 *communes* (*j*) can be calculated, summarizing the 29 selected indicators, weighted according to the preferences of Lyon residents. For ease of comprehension, the potential well-being indices are recalibrated on a scale of 0 to 10, such that the well-being index of the least favoured *commune* is 0, that of the most favoured *commune* is 10, and that of all other *communes* corresponds to a percentage of the difference between these two thresholds.

If we analyse the distribution of these indices of potential well-being for *communes* in Rhône-Alpes, what does this tell us? Are there significant differences between *communes*? Would Lyon residents enjoy a higher level of well-being outside Lyon?

#### 4.2 Marked disparities in potential well-being between communes in Rhône-Alpes

The calculation of simple descriptive statistics shows that the distribution of the potential well-being index within the *communes* of the Rhône-Alpes region is relatively narrow. The mean index value is 5.5, the median 5.4, with a 1<sup>st</sup> quartile of 5 and a 3<sup>rd</sup> quartile of 5.9. If we classify the 2,843 *communes* into deciles accord-

ing to their well-being index, we see that the value of the 1<sup>st</sup> decile stands at 4.6 and that of the 9<sup>th</sup> decile at 6.6. However, the distribution shows very significant differences between *communes* below the 1<sup>st</sup> decile and above the 9<sup>th</sup> decile: the value of the 1<sup>st</sup> percentile stands at 3.1, and that of the 99<sup>th</sup> percentile at 8.3.

Looking beyond the simple calculation of descriptive statistics, it is possible to conduct an analysis of spatial autocorrelation. This is very useful for studying spatial structures. By making use of Moran's *I*, it can be verified whether the relationships between neighbouring spatial units are more pronounced than with the rest of the statistical population, since Moran's *I* represents the ratio of the covariance of a point and its neighbours in space to the total observed variance (Anselin et al. 2006). The calculation of Moran's *I* when applied to the potential well-being index of the 2,843 *communes* of Rhône-Alpes reveals significant disparities within the region in 2017. It shows significant ( $p < 0.001$ ) and positive spatial autocorrelation with a Moran's *I* value of 0.60. This means that the socioeconomic distance between advantaged *communes* (with a high potential well-being index) and disadvantaged *communes* (with a low potential well-being index) tends to be coupled with geographical distance. In Rhône-Alpes, therefore, neighbouring *communes*<sup>6</sup> tend to have similar values of potential well-being.

But what is the precise nature of this geography of potential well-being, and what forms does it take?

#### 4.3 Rural Alpine mountain areas of Rhône-Alpes dominate the geography of potential well-being for Lyon residents.

Mapping the potential well-being of Lyon residents reveals very marked territorial disparities between rural areas, mostly on the fringes of Rhône-Alpes, which generally offer high levels of well-being, and urbanized areas, which generally offer low levels of well-being (*Fig. 3*).

Levels of potential well-being are highest in *communes* located on the fringes of the Rhône-Alpes region. More specifically, peripheral *communes* in the Ardèche *département* and in the south of the Drôme *département* (the area known as Drôme Provençale), as well as *communes* high in the mountains of the Isère, Savoie and Haute-Savoie *départements*, have the highest scores for potential well-being (see *Fig. 3*). Moun-

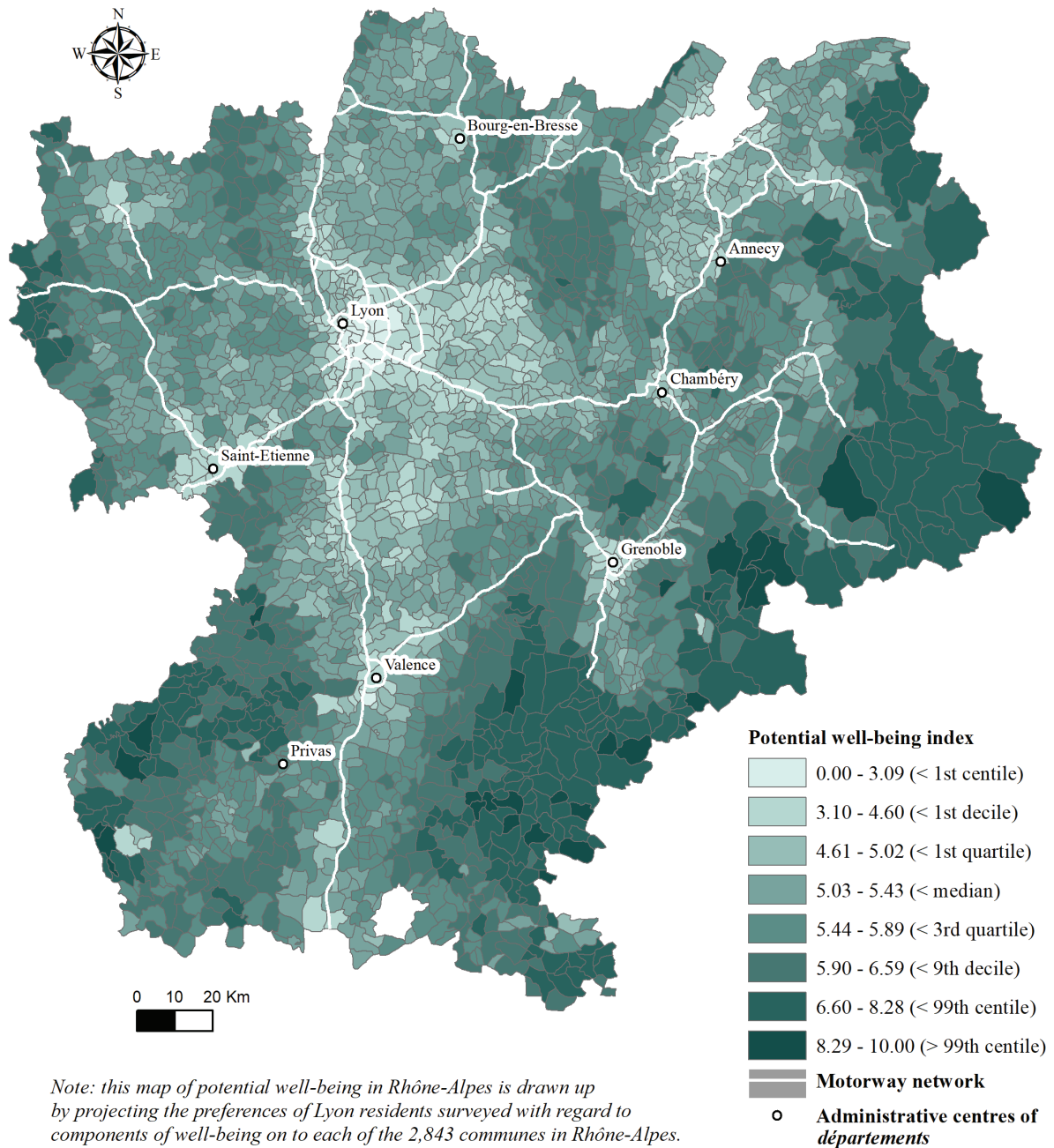


Fig. 3 Lyon residents' potential well-being in Rhône-Alpes in 2017. Source: own elaboration

tain areas thus have the greatest potential in terms of well-being, as they display the greatest natural amenities in our region of study. In a different region (such as the coastal Aquitaine region), seaside municipalities would, for the same reason, most probably be the areas with the highest potential well-being. Of the 284 communes that make up the 9<sup>th</sup> decile, 60 are in Ardèche, 94 in Drôme, 51 in Isère, and 44 in Savoie, while just 17 are in Haute-Savoie, 16 in Loire, 2 in Ain, and 0 in the Rhône département (where Lyon is situ-

ated). Conversely, it is in the most urbanized départements of Rhône-Alpes that the communes with the lowest levels of potential well-being are to be found. Of the 283 communes in the 1<sup>st</sup> decile, 81 and 71, respectively, are located in the départements of Isère (which includes Grenoble and the eastern outskirts of the Lyon metropolitan area) and Rhône (which includes the majority of the Lyon metropolitan area), compared with just 37 in Ain, 28 in Loire, 27 in Haute-Savoie, 23 in Drôme, 11 in Ardèche, and 6 in Savoie.

However, this generally unfavourable situation for urban areas masks significant nuances, which can be observed between and within the different built-up areas. In particular, towns in mountain areas obtain high scores for potential well-being, while the opposite is true for towns located in valleys. For example, Chamonix, a *commune* of 9,000 inhabitants in the mountains of Savoie, has a potential well-being score of 7.1, while Montélimar (Drôme), located in the southern Rhône Valley, with 37,000 inhabitants, has a potential well-being index of 4.3. The same is true for the centre cities of large urban areas. A significant dividing line can be drawn between, on the one hand, the administrative centres of the two eastern *départements* (Chambéry in Savoie and Annecy in Haute-Savoie with a potential well-being index standing at 4.6 and 4.3 respectively) and, on the other hand, the region's other major cities (with an index inferior to 3.5).

Within each built-up area, disparities are also significant. They are particularly marked in the Greater Lyon area. Within Greater Lyon, areas of ill-being are concentrated in the east, particularly in suburbs containing large social-housing estates: Vénissieux, Saint-Fons, Bron, and Saint-Priest are the four *communes* with the lowest values for potential well-being, at below 0.6. The western suburbs of Lyon, by contrast, perform much better: *communes* in the Monts d'Or hills to the north-west of Lyon, such as Saint-Cyr-au-Mont-d'Or and Saint-Didier-au-Mont-d'Or, as well as *communes* immediately to the west of the city, such as Francheville and Craponne, obtain or approach index values of 5.

### 5. Conclusion: well-being is to be found in certain rural areas

In identifying the preferences of the inhabitants of a large French city, Lyon, this study revealed the importance that these residents attach to environmental factors when it comes to their well-being. This process also highlighted the fact that, for Lyon residents, two essential components for well-being are access to health services, and the safety of people and property. By then spatially projecting their preferences for different components of well-being on to all the *communes* of the former Rhône-Alpes region, the study showed that these residents would potentially benefit from higher levels of well-being if they were to settle in a rural *commune* on the south-eastern or western fringes of the region.

More specifically, the places where the Lyon residents surveyed live have particularly low levels of potential well-being. The 7<sup>th</sup> and 6<sup>th</sup> *arrondissements* of Lyon are, respectively, the *communes* with the 9<sup>th</sup> lowest and 23<sup>rd</sup> lowest values for potential well-being (with respective potential WBI values of 2.1 and 3). Similarly, highly urbanized *communes* in urban cores and suburbs – such as Vaulx-en-Velin in Greater Lyon (2.4), Échirolles in the Grenoble suburbs (2.8), Annemasse on the outskirts of Geneva (3.3), and Roanne in the Loire *département* (3.6) – also have low scores for potential well-being. By contrast, *communes* in rural areas – and in particular on the western and south-eastern fringes of Rhône-Alpes, such as Saint-Jeand'Arves in Savoie (with a potential WBI of 8.9), Lus-la-Croix-Haute in the Drôme *département* (potential WBI of 8.2) or Ambel in Isère (potential WBI of 8) – appear to offer living environments with higher potential levels of well-being for Lyon residents. It is therefore in the rural areas of the south-east of the region that inhabitants of Lyon would enjoy the highest levels of potential well-being, while in the region's major urban areas, in the Rhône valley, and on the plain to the east of Lyon, their level of potential well-being would be low.

Based on the preferences of Lyon residents, there exists a certain dichotomy between town and country within Rhône-Alpes as far as well-being is concerned. The inhabitants surveyed demonstrated, through their preferences, their desire to live in the countryside, in a natural setting. Furthermore, these results are consistent with the findings of a number of surveys regarding French people's aspirations, such as the study conducted by *Crédoc* (2017), which found that the leading reason for moving home cited by French respondents was the prospect of a better living environment.

Lastly, this methodology is designed to be completely transferable. It may be implemented for any area, at different scales of analysis (neighbourhoods, municipalities, regions), and for different targeted populations: elderly people, households with children, young workers, samples representative of the inhabitants of a given area, etc. The region of study, the scale of analysis, and the target population can be varied according to the objective of the study. Above all, identifying the preferences of individuals with regard to territorial components of well-being is relevant for decision-makers. When developing policies to foster territorial attractiveness and territorial hospitality,

it is crucial to understand what factors determine individuals' well-being in their area of residence. Our methodology means it possible to verify whether the components identified as important for the well-being of the surveyed populations are present within the study area. Consequently, this procedure may be used as a tool for territorial assessment, by highlighting the strengths and weaknesses of the study area. Above all, it takes into account the social expectations of populations and incorporates well-being as an objective of public policy.

### Acknowledgements

We would like to thank the interns Guillaume Barral, Clémence Crapart, and Maxime Fichet, and their colleagues Muriel Maillefert, Octavie Paris, Lisa Rolland, William de Septenville, Didier Soto, and Pauline Texier. We would also like to thank Oliver Waine for the translation of this paper into English. We would like to thank Daniel Roybin; INRAE; Auvergne-Rhône-Alpes Regional Council; and the European Union. Our article was written as part of the BRRISE European innovation project (*Bien-être, attractivité des territoires ruraux et inégalités socio-spatiales* – “Well-Being, Attractiveness of Rural Areas and Sociospatial Inequalities”), within the context of the PSDR 4 programme (*Pour et sur le développement régional, 4<sup>e</sup> génération* – “For and About Regional Development, 4<sup>th</sup> generation”), which ended in December 2020.

### Notes

- <sup>1</sup> By asking three questions: “In the area where you live, what factors foster well-being? Conversely, what factors foster ill-being? What are you willing to do to contribute to collective well-being?”
- <sup>2</sup> The former administrative region of Rhône-Alpes comprises the eight départements (counties) of Ain, Ardèche, Drôme, Haute-Savoie, Isère, Loire, Rhône, and Savoie. In 2016, this region merged with the neighbouring Auvergne region, to form the new region of Auvergne-Rhône-Alpes. This paper concerns the former Rhône-Alpes region only.
- <sup>3</sup> The 6<sup>th</sup> *arrondissement* of Lyon is situated to the north-east of the city centre and includes the city's main park – the Parc de la Tête d'Or – and the neighbourhoods of Les Brotteaux and Bellecombe. The 7<sup>th</sup> *arrondissement* is situated to the south-east of the city centre and includes the neighbourhoods of La Guillotière and Jean Macé (in the north) and Gerland (in the south).
- <sup>4</sup> The first part comprises two questions: one on overall life satisfaction (Inglehart 2000) and one with regard to the

*commune* of Noirétable in the Loire *département* of east-central France. The second part records individuals' preferences; the third concerns the way in which respondents make use of their time; the fourth comprises socioeconomic questions; and the fifth repeats the questions from the first/second/third/fourth part.

- <sup>5</sup> The wording of the question is as follows: “What are the ten most important criteria that an area must fulfil in order to ensure your general well-being?”
- <sup>6</sup> The criterion we have chosen in order to determine whether *communes* are considered to be “neighbouring” is that of inverse Euclidean distance, bearing in mind the construction of the statistical indicators that make up the potential well-being index.

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