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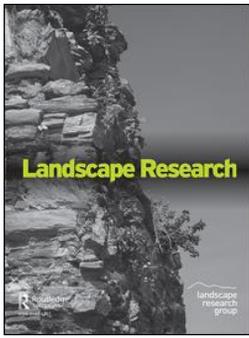
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# Metropolitan mountains: Sainte-Victoire as a public park in Aix-Marseille Provence Metropolis, France

Benoit Romeyer <sup>a</sup>, Ruth Mpozagara<sup>a</sup> and Jean Noël Consales <sup>b</sup>

<sup>a</sup>Laboratoire Interdisciplinaire Environnement Urbanisme, Aix-Marseille Université, Marseille, France; <sup>b</sup>Laboratoire TELEMme, Aix-Marseille Université, Marseille, France

## ABSTRACT

Metropolisation leads to the physical, functional, and symbolic integration of urban natural areas. In this context, can metropolitan mountains be considered vast public parks in their own right, adapting to new scales of functionality within their territory? To tackle this question, we carried out a questionnaire-based survey among local residents and users of Sainte-Victoire mountain in the Aix-Marseille-Provence Metropolis, France. Its results highlight the existence of proximity-based perceptions and practices towards Sainte-Victoire. In this respect, the mountain possesses certain characteristics that are associated with intra-urban green spaces. However, it differs from intra-urban green spaces in that its users categorise their patterns of frequentation as exceptional and episodic, and that access to and specific uses of it strongly depend on owning a car. This article therefore calls for an environmental management strategy that better coordinates emblematic urban natural spaces, such as Sainte-Victoire, with other metropolitan green spaces.

## KEYWORDS

Metropolitan mountain; metropolisation; urban protected area; perceptions; practices; landscape planning

## Introduction

Metropolisation is a complex process tending towards the constitution of vast urban areas with a reticular mode of functioning. It thereby leads to the physical, functional, and symbolic integration of natural areas that were previously residual within vast interconnected conurbations (Ascher, 1995; Dematteis, 2018; Fourny, 2018; Perlik, 2019). Progressively taken over by urban development, these natural areas are subjected to increasing human pressure. This situation thus justifies the development at the global scale of public policy favouring the protection of their landscapes and environment (McDonald et al., 2009). Numerous studies have described this spectacular progression, highlighting their wide variety in terms of size, spatial distribution, legal status, management model and their conservationist, social and economic purpose (Watson et al., 2014). The International Union for Conservation of Nature (IUCN) considers that virtually all protected areas are affected by urbanisation. This organisation has therefore developed the concept of 'urban protected areas' to designate the urban natural spaces (Jarvis et al., 2020) situated within or in the surroundings of major population centres, excluding public parks and gardens (Tryzna, 2014). These urban protected areas have a two-fold specificity. They are, on the one hand, associated with multiple stakeholders (territorial authorities, managers, businesses, inhabitants), for the most part related to urban priorities and cultural interests. On the other hand, they are subject to a range of pressures and disturbances resulting from the urban development that surrounds them and taking expression in terms of property market pressure, pollution and the degradation of the environment,

exposure to risk, and so on. The dynamics of metropolisation plays a role in the emergence of a new paradigm in matters of the development and the management of these protected areas. This more 'integrative' paradigm implies that city and nature can no longer be thought of within a register of absolute opposition and that nature should rather be fully integrated into the landscape and urban planning processes (Depraz, 2008).

In this context of seeking to go beyond the nature–culture dichotomy (Descola, 2005), a 'conservation geography' (Mathevet & Godet, 2015) trend has focused on the territorial association of urban natural spaces and their relationship with urban spaces. Within this body of work, the metropolitan component is seen as a source of complexification of the protection and management of these urban natural spaces. The analysis of the socio-political tensions and the socio-environmental inequalities resulting from the application of measures of restriction of access and uses generally has tended to dominate this literature (Fourault-Cauët, 2017). Other studies, more rooted in the fields of landscape and urban planning, have sought to analyse the contribution of urban natural spaces to the process of metropolisation. In the context of Western societies marked by the development of leisure time, the resulting convergence of urbanised and natural areas may appear as the vector of a whole range of ecosystem services (Millennium Ecosystem Assessment, 2005). These benefits are notably expressed in terms of cultural services related to stress reduction (Grahn & Stigsdotter, 2003) and opportunities provided for the practice of various forms of physical activity (Sever & Verbič, 2018; Takano et al., 2002). The new-found power of attraction of these urban natural spaces is accompanied furthermore by changes in the dynamics of residential localisation and of the property market related to these areas (Brander & Koetse, 2011; Decoupigny, 2007; Van Herzele & Wiedemann, 2003). Having become *de facto* stakeholders in the territorial offer of the metropolises (Arnould et al., 2011), the urban natural spaces have tended to be subjected to top-down integration in the processes of urban planning (Girault, 2017). In parallel, the attachment generated by long-standing and/or regular use of these urban natural spaces by populations has also generated bottom-up popular community mobilisation in favour of their preservation (Aschan-Leygonie et al., 2015). The integration within the metropolis of an urban natural space may then appear as an advantage with regard to its protection against urban sprawl.

The present article is situated within this second field of research focused on the dynamics of the metropolisation of urban natural spaces. More specifically, the aim is to analyse the perceptions and practices generated by the presence of an urban natural space of the metropolitan mountain type among the local residents and users.

Since the 2015 urban and territorial consultations for the Aix-Marseille Provence Metropolis (France) and the prospective framework of the 'landscape-islands' (*'îles-paysages'*) proposed by the agency LIN (Théry et al., 2016), the general trend among local officials and planners is to attribute the potential of vast public parks to the numerous metropolitan mountains characterising this singular territory (Consalès & Millias, 2020). This provides a perfect case to examine the way that a protected metropolitan mountain area functions in relation to the other existing types of metropolitan green spaces.

While numerous studies have dealt with daily perceptions and practices relative to intra-urban green spaces (Arrif, 2009; Sanesi & Chiarello, 2006; Tremblay & Simard, 2011) and peri-urban forests (Papillon & Dodier, 2011; Tyrväinen et al., 2007; Van Herzele et al., 2005), fewer have focused on other forms of green spaces, such as metropolitan mountains.

There is consensus in the existing literature in this field regarding the existence of perceptions and practices relative to these different types of metropolitan green spaces that are strongly tributary to their distance from the place of residence of the local populations (Arrif, 2009; Boutefeu, 2009; Sanesi & Chiarello, 2006; Tremblay & Simard, 2011). Research has evidenced correlations between residential proximity and the everyday practices associated with intra-urban green spaces. But proximity alone does not determine green space uses (Park, 2017). More generally, the literature shows that the perceptions and practices relative to the different metropolitan green spaces are also dependent on social variables, such as age (Sanesi & Chiarello, 2006), the ability to

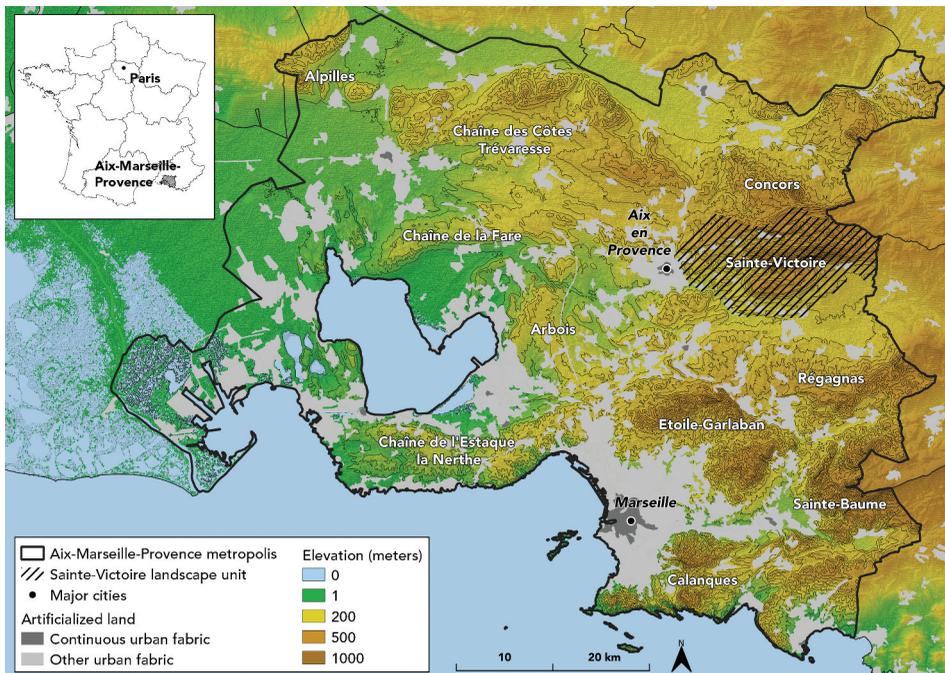


Figure 1. Aix-Marseille-Provence Metropolis and its mountains, including Sainte-Victoire.

access a garden—private or immediately adjacent to an apartment (Grahn & Stigsdotter, 2003)—or the fact of belonging to a particular residential zone (Arrif, 2009; Van Herzele et al., 2005). Taken together and associated with complex and composite territorial realities, these factors contribute to making metropolitan green spaces places of frequentation and multiple practices (Sansot, 2003).

Do these characteristics also apply to other types of metropolitan green spaces, such as metropolitan mountains? In a context of metropolisation as a generator of new forms of overlapping between urbanisation and urban natural spaces, can these metropolitan mountains appear, by extension, as types of vast public parks adapted to the new scales of functioning of territories? To tackle these questions, the present article proposes the hypothesis that the perceptions and practices associated with these metropolitan mountains operate in a spatially and socially differentiated way.

To answer these questions and to test this hypothesis, we shall focus on an emblematic metropolitan mountain of the Aix-Marseille-Provence Metropolis which thus tends to be attributed the potential of becoming a vast public park: Sainte-Victoire (see Figure 1). But what is the basis of this territorial vision in practice? Does the presence of a metropolitan mountain already generate various local practices? Or does it rather attract frequentation of an exceptional kind? In other words, do these metropolitan mountains function as vast public parks that play a role in metropolisation? Or, because of the protection measures that govern them, do they function as spaces that are relatively independent of this process?

## Material and methods

### *Territorial context*

Officially set up in 2016, the Aix-Marseille-Provence Metropolis is a French territorial authority involving 2 million inhabitants over a territory of 3150 km<sup>2</sup>. It is the second biggest metropolis in France in terms of population, after Paris, and is also the most extensive. This exceptional

surface area is matched by a polycentric mode of functioning which further distinguishes it from other French metropolises. These territorial specificities should be seen in relation to the strongly Mediterranean character of this coastal metropolis, characterised by large mountains that play a role in structuring the area in population subcatchment areas. Consisting of typically Mediterranean vegetation rich in biodiversity, these 19 metropolitan mountains constitute the main natural areas of the Aix-Marseille-Provence Metropolis made up of 50% of so-called natural spaces, mostly forests, 27% of artificial spaces and 19% of agricultural spaces (AGAM, 2017).

In addition to their territorial and organisational importance, these large mountains play a key role in relation to the power of attraction of the metropolis and the life of its inhabitants. They generate a high level of recreational and touristic frequentation as sites for leisure activities (Decoupigny, 2007). Their attractiveness is also reflected in terms of land pressure. The fringes of the metropolitan mountains thus appear to be particularly threatened by urban sprawl (AGAM, 2017).

Because of their special status, their exposure to urban dynamics and the numerous ecosystem services they provide, these iconic landscape structures also enjoy a certain degree of legal protection. However, not all these metropolitan mountains enjoy the same protective measures, nor are they taken into account to the same extent in the urban planning documents of the Aix-Marseille-Provence Metropolis. Thus, with their shared status of Natura 2000 areas and listed sites (*site classé*) which place them under the direct control of the French State, the Calanques and Sainte-Victoire are the most strongly protected and emblematic sites in the territory. While the former is also classified as a national park, the management of the latter has been recognised by the designation 'Grand Site de France' in 2004, 2010 and 2019. Owing to its flagship status for its territory and its worldwide recognition, we have chosen to focus on this metropolitan mountain.

Sainte-Victoire is a limestone formation 18 km long and 5 km wide, with an altitude ranging from 195 to 1016 m. In addition to its geomorphological characteristics as a Mediterranean mountain, it was made famous by the many paintings of it by Paul Cézanne. These paintings progressively acquired worldwide renown and contributed to a real transformation of the representations associated with this mountain. During the 20th century, Sainte-Victoire progressed from being a rural area of no particular interest to a 'highly qualified territory, an emblematic space, saturated impregnated with meaning' in the words of the French historian Pierre Vidal-Naquet (1992, p. 13) (see Figure 2).

In addition to its celebration by this guiding light of Impressionist painting, Sainte-Victoire is also indissociable from the group of municipalities associated with the city of Aix-en-Provence (*Pays d'Aix*), among which it takes centre stage, and of which it is the main symbol (Pinson, 2006). The preservation of this iconic 'Cézannesque' landscape has thus become a major priority for the territory. Despite its virtually timeless geological structure, the landscape of Sainte-Victoire remains nonetheless fragile, as evoked by the dramatic fire of 1989. A site prized by local inhabitants and tourists alike, Sainte-Victoire is exposed, in the same way as the massif of the Calanques, to strong anthropic pressure calling for the implementation of control, protection and management measures. An administrative body (*syndicat mixte*) specifically dedicated to its management was set up in the wake of feeling generated by the fire: The *Grand Site Concors Sainte-Victoire* (GSCSV). Integrated since 2017 as a department of the Aix-Marseille Provence Metropolis, the mission of this body consisting of 14 municipalities at the time of the present study (17 today) is to protect and enhance a territory of 48, 904 hectares extending between Sainte-Victoire mountain and the Concors massif further to the north. In relation to the identifying and emblematic character of the landscape, Sainte-Victoire constitutes the focal point of a territory of which in its turn it contributes to shaping the spatial dynamic, as well as its social practices and perceptions.

### **Survey and processing methodology**

A questionnaire-based survey has been employed to understand the practices and perceptions associated with Sainte-Victoire from the point of view of the local inhabitants and users. The questionnaire was designed on the basis of two main filters. The first determines whether or not



Figure 2. The iconic landscape of Sainte-Victoire.

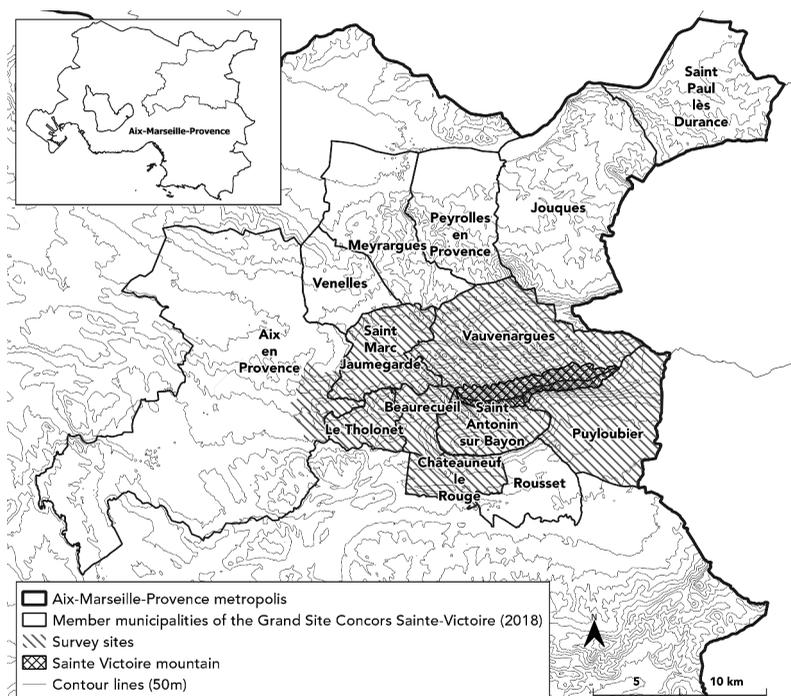
the responder's municipality of residence is part of the GSCSV. The second concerns the frequentation or not of Sainte-Victoire. Four main profiles of responders were thus defined. For each of these groups, a specific set of questions was presented (see [Table 1](#)) focusing on the following topics:

- their residence history relative to Sainte-Victoire,
- their uses and practices relative to Sainte-Victoire,
- their opinion of their place of residence and of Sainte-Victoire,
- their opinion of the municipality where the survey was administered and of Sainte-Victoire,
- their feeling of belonging to a territory,
- the profile of the responders.

Solely constituted of qualitative-type questions, the questionnaire is made up of 33 questions (upper limit) for the residents of a 2018 GSCSV municipality frequenting Sainte-Victoire, and of 15 (lower limit) for non-GSCSV residents not frequenting Sainte-Victoire. This survey was carried out between March and May 2019 by 40 students from the first year Master's course in Urban Planning at Aix-Marseille University. The questionnaire was administered *in situ* to populations encountered at various points in a set of seven municipalities (Aix-en-Provence, Beaurecueil, Châteauneuf le Rouge, Le Tholonet, Puyloubier, Saint Antonin sur Bayon, Saint Marc Jaumegarde and Vauvenargues) representing the main gateways to Sainte-Victoire site and offering an exhaustive view of the municipalities in direct proximity to the mountain (see [Figure 3](#)). This survey was conducted at different times of the day and on different days of the week and of the weekend.

**Table 1.** Topics covered in the questionnaire according to the population group questioned.

Topic	GSCSV resident frequenting Sainte-Victoire	GSCSV resident not frequenting Sainte-Victoire	Non-GSCSV resident frequenting Sainte-Victoire	Non-GSCSV resident not frequenting Sainte-Victoire
Residence history relative to Sainte-Victoire	X	X		
Uses and frequentation of Sainte-Victoire	X		X	
Opinion of the place of residence and of Sainte-Victoire	X	X		
Opinion of the survey municipality and of Sainte-Victoire			X	X
Feeling of belonging to the residence territory	X	X		
Profile of responders	X	X	X	X

**Figure 3.** Surveyed sites within the Grand Site Concors Sainte-Victoire.

The processing of the data collected was performed using various types of statistical analysis, including, in particular, a Multiple Correspondence Analysis (MCA) type factorial analysis carried out using the software R (R Core Team, 2020) and the package FactominerL (Lê et al., 2008). This method of statistical analysis is particularly well suited to the processing of results from questionnaires of this type (Husson et al., 2016). It was focused on a set of data (23 variables) relative to declared perceptions and uses of the mountain. These were compared to other variables relative to the intrinsic characteristics of the individuals (11 variables).

In order to enable a spatialised survey according to the municipality of residence in the GSCSV, a re-segmentation of the territory in four subcatchment areas was proposed (see Figure 4): Aix-en-Provence, Sainte-Victoire north face, Sainte-Victoire south face, Arc valley. This re-segmentation was

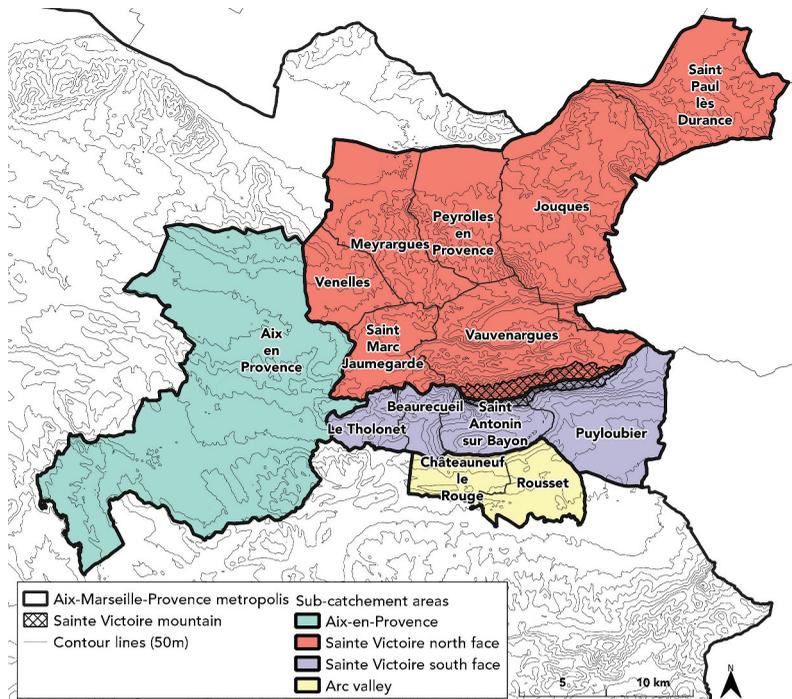


Figure 4. Subcatchment areas within the Grand Site Concors Sainte-Victoire.

done on the basis of a combination of both geographical (position of the municipalities in relation to Sainte-Victoire) and socio-demographic (size of municipalities and pattern of functioning, in particular, relative to home–work commutes) criteria. The full set of data collected was related to the whole of the parent-population to ensure its statistical validity.

## Results

Seven hundred and fourteen people were questioned concerning their practices relative to Sainte-Victoire. The four main profiles of responders initially identified are distributed as follows: (i) residents of the GSCSV frequenting Sainte-Victoire (376), (ii) residents of the GSCSV not frequenting Sainte-Victoire (126), (iii) non-residents of the GSCSV frequenting Sainte-Victoire (160), (iv) non-residents of the GSCSV not frequenting Sainte-Victoire (49). The sample group surveyed is thus constituted mainly of people resident within the municipalities of the GSCSV (505) and people who frequent Sainte-Victoire (536). The sample group of 505 people was thus the one that featured most often in this survey, except for the MCA where only the sample group of 376 individuals were questioned. Relative to the parent-population of the territory under consideration (183, 710 habitants), this sample of 376 individuals is associated with a margin of error of 4% for an interval of confidence of 95%. The results obtained are thus likely to be similar to those that would result from a survey of the parent-population.

The sample group offers a pattern of distribution that is at once balanced in terms of gender (51% men and 49% women) and consistent in terms of distribution by age among an adult population base. Seventy-eight per cent of the sample group were in the 18–65 age range. As is often the case for this type of survey, the least represented category is the less than 18-year-old age range, with 1% of responders. With a frequency of 35%, the age group the most strongly represented is that of the 26–45 age range. The socio-economic profile of the people surveyed shows a pattern of distribution

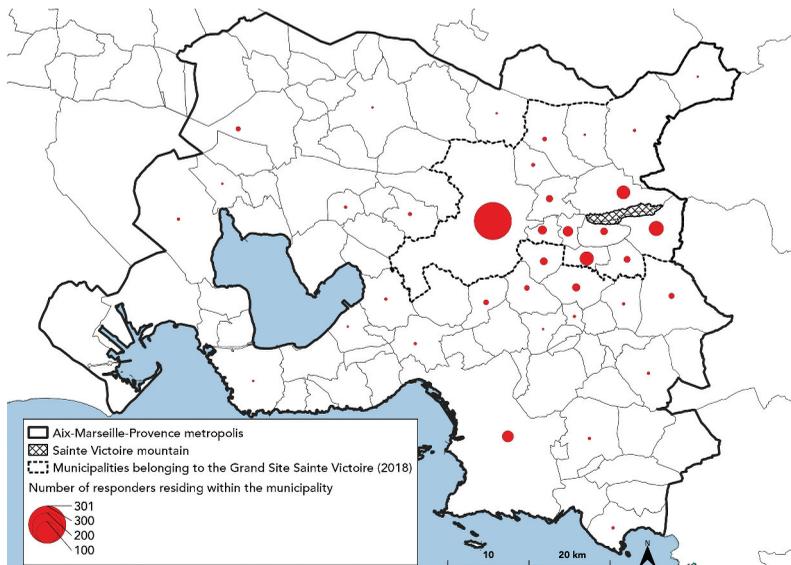
that is consistent with that of the territory surveyed. The survey included a small proportion of farmers (1%) and a fairly large proportion of retired people (25%), employees (21%) and managerial staff (19%). In relation to the strongly university-related character of Aix-en-Provence, we find too within our sample a considerable number of students (11% of responders).

The spatial distribution of the people questioned in terms of subcatchment area is marked by the demographic weight of Aix-en-Provence where almost 80% of the inhabitants of the territory reside. This value is only about 60% in the present survey (301 respondents), where the weight of the perceptions and practices of residents of the outlying municipalities has thus been accentuated (see [Figure 5](#)). It should be noted that this pattern of distribution results in large part from the choice of site for the application of the questionnaire. The populations surveyed in the other subcatchment areas are distributed as follows: 59 respondents for Sainte-Victoire north face, 95 respondents for Sainte-Victoire south face and 50 respondents for the Arc Valley. Concerning Sainte-Victoire north face subset, the results show that 11 respondents only came from the five northernmost communes. Data from this subcatchment area therefore appear to be dominated by the perceptions and practices of populations in direct proximity to the mountains. This relatively low presence of people from the northernmost communes of the GSCSV on Sainte-Victoire site can also be interpreted as revealing a distance decay effect.

Regarding the stated perceptions and practices, the survey revealed four main sets of results: (i) relatively homogeneous perceptions of the territory emphasising the outstanding character of the landscape of Sainte-Victoire, (ii) frequentation of the mountain that is not an everyday practice for most of those questioned, (iii) practices that are differentiated according to the proximity of the territories to Sainte-Victoire, (iv) frequentation practices that are also socially differentiated.

### ***Relatively homogeneous perceptions of the mountain emphasising the outstanding character of the landscape***

Apart from the recognition of its heritage and artistic value as a natural monument, Sainte-Victoire is seen as an outstanding landscape in the eyes of the great majority of people questioned. This very positive opinion is reflected in the words used by residents and non-residents of



**Figure 5.** A surveyed population concentrated within the municipalities (communes) belonging to the Grand Site Concors Sainte-Victoire.

the GSCSV to describe the landscape of Sainte-Victoire. The most frequently used term is '*magnifique*' (magnificent), used by 18% of responders. The people questioned repeatedly described the landscape of Sainte-Victoire using words highlighting its beauty and echoing the aesthetic concept of "the sublime". Thus, Sainte-Victoire appears, in the eyes of observers, as a grandiose manifestation of nature. These results contrast with those obtained for the landscapes of the municipalities in the surroundings of Sainte-Victoire. These are also described as beautiful, but this time without echoing the notion of the sublime and associated with a natural and peaceful character. The results thus also indicate a tangible dichotomy between the extraordinary character of the massif painted by Cézanne and the ordinary beauty, every day and vernacular, of the municipalities in the surroundings of Sainte-Victoire. Despite this distinction between the landscape of the ordinary of the surrounding municipalities and the landscape of the extraordinary of the mountain, the aesthetic and natural value of these municipalities is nonetheless closely linked to the proximity of Sainte-Victoire. Thus, 85% of the residents of municipalities that are members of the GSCSV reply in the affirmative to the question: 'Do you think that the proximity of Sainte-Victoire is important for your municipality of residence?'. Forty-four per cent of these people justified the importance of this proximity between Sainte-Victoire and their municipality by the landscape, natural and environmental quality that it offers them. For this major proportion of the residents of the GSCSV, to have the benefit of such a remarkable natural area in proximity is a positive contribution to their living environment. This landscape value is in addition mirrored by a symbolic and cultural dimension for 27% of those questioned. Although they fall within a more directly material register, the various uses and practices provided by Sainte-Victoire are, by contrast, relatively little emphasised (12% of the people questioned).

This form of 'excellence' associated with the mountain is also apparent in the results obtained for the question 'What are the assets and the drawbacks of the GSCSV?'. Forty-four per cent of responders consider that there are in fact no drawbacks. The problems associated with this site concern firstly its high rate of frequentation (22%). Then, there are the issues related to the difficulty of access to the site (12%), and more marginally the fact of a very high risk of forest fires in the sector, resulting in the total closure of the site in summer (6%). In the end, Sainte-Victoire tends to be nearly systematically referred to as an outstanding natural area offering a substantial added value to the urban entities that surround it. A relatively homogeneous set of perceptions between residents and users thus emerges from this survey.

### ***A pattern of frequentation of the mountain that is not related to everyday practices***

The agreeable environment provided by Sainte-Victoire also makes it a favoured site to visit and explore that 75% of the people questioned claim to frequent. A more in-depth analysis shows, however, that the exceptional landscape quality associated with Sainte-Victoire tends in fact to be matched by the exceptional nature of its frequentation. Only a minority of people (13%) frequent Sainte-Victoire on a weekly or multi-weekly basis. On the other hand, almost half of them (40%) visit on an annual or biannual basis. In fact, while Sainte-Victoire appears as a space that is frequented by most of the people questioned, these visits do not come within the register of everyday practices for most of them. The analysis also shows that 65% of the people frequent Sainte-Victoire rarely (less than once a month), and only 35% visit it more often (more than once a month). When we look closely at the types of uses and practices associated with Sainte-Victoire, the mountain appears first as a site for leisure activities, firstly for relaxation and then for sporting activities. Sixty-three per cent of the people who frequent Sainte-Victoire say they go there to relax, whether it is to go for a walk to observe the landscape or to enjoy a quiet moment in this emblematic setting. Hiking is the main sporting activity with 53% of responders claiming to practice it. One may observe too the presence of a relatively large number of users (21%) who come to Sainte-Victoire to engage in other more demanding forms of sport, such as trail running, mountain biking, climbing or paragliding.

Regarding the form of transport used to go to the site, private cars are the most used, by almost 80% of those questioned.

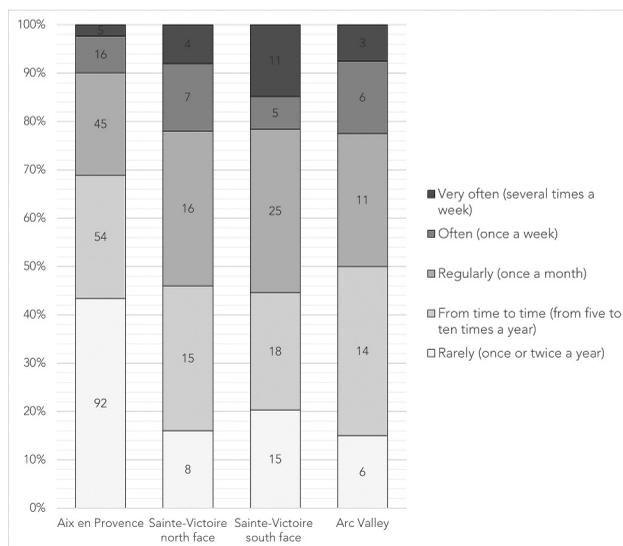
### ***Patterns of frequentation differentiated according to the proximity of territories to Sainte-Victoire***

The analysis of the sample of individuals frequenting Sainte-Victoire shows furthermore that the frequentation is differentiated according to the proximity of the municipality of residence; this applies both to the practices and to the mode of transport used to go there. As regards the frequentation of the massif, Aix-en-Provence quite clearly shows the highest proportion of individuals frequenting Sainte-Victoire rarely (one to two times a year) (see Figure 6).

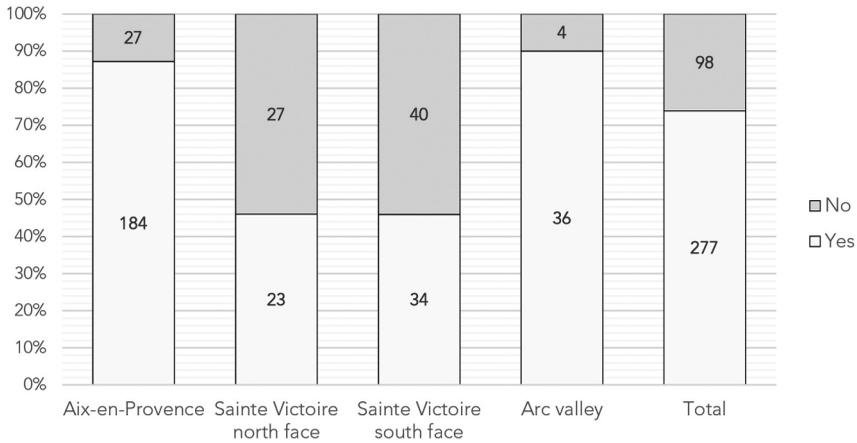
Regarding the mode of transport used to go to the site, two main profiles emerge. On the one hand, the subcatchment areas directly adjacent to the mountain (Sainte-Victoire north face and Sainte-Victoire south face), where the car is used by 50% of those questioned. On the other, the subcatchment area of Aix-en-Provence and the Arc valley where the car, used by almost 90% of responders, shows a virtually hegemonic domination in terms of the modal split (see Figure 7). While there are distinct differences in the mode of frequentation of Sainte-Victoire according to the subcatchment areas considered, the types of activity practiced at Sainte-Victoire appear as mainly homogeneous.

The multiple correspondence analysis showed the existence of a first dimension of which the inertia (9.38%) distinguishes it clearly from the other dimensions (see Figure 8). Thus, owing to its significantly higher influence on the data structure, we shall focus our interpretation on it. The detailed analysis of this first axis shows that the variable 'frequency of frequentation' is the most strongly linked to this first dimension of the MCA ( $R^2 = 4.778E-01$ ;  $p\text{-value} = 7.610E-50$ ). It can then be considered as the one that determines most strongly the practices and perceptions associated with the mountain among the users.

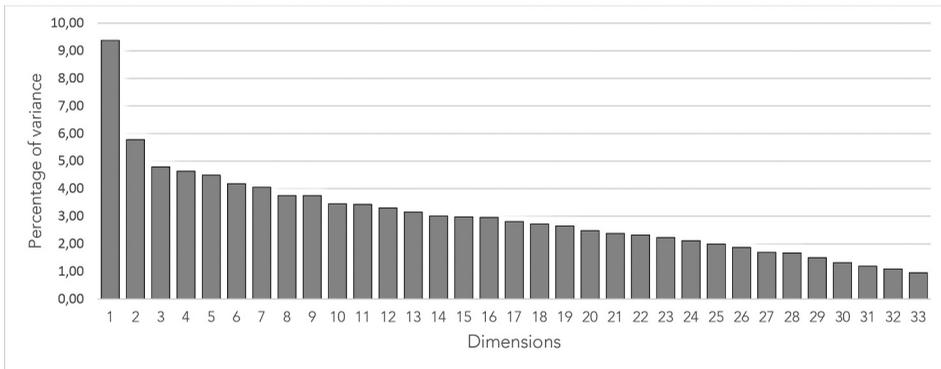
The cloud of individuals thus appears as marked by a gradation on the horizontal axis of the graph (Dim. 1) in the declared intensity of frequentation of Sainte-Victoire mountain (see Figure 9). We find, from left to right, the individuals declaring that they frequent Sainte-Victoire 'rarely' (once or twice



**Figure 6.** Numbers and percentage frequency of responses to the question 'How often do you practice Sainte-Victoire?', in function of subcatchment areas.



**Figure 7.** Numbers and frequency in percent of individuals who answered 'Car' to the question 'What form of transport do you use to go to there?', in function of subcatchment areas.



**Figure 8.** Decomposition of the MCA's inertia.

a year), then those who declare that they frequent it 'from time to time' (from five to ten times a year), those who declare that they frequent it 'regularly' (once a month), 'often' (once a week) and finally 'very often' (several times a week). Further analysis of the MCA results also reveals that an intense frequentation of Sainte-Victoire is positively correlated with the fact of going there on foot, and negatively correlated with the use of a car. Consistently with the previous results, an intense frequentation of the mountain is also positively correlated with the fact of residing in the subcatchment areas the most directly in contact with it (Sainte-Victoire north face, Sainte-Victoire south face and Arc valley). This first axis thus also tends to contrast the residents of the municipalities that are closest to the mountain with those that are further away from it. An intense frequentation of Sainte-Victoire is furthermore correlated with a choice of implantation within the territory in relation to the proximity of this natural area, and with the declared practice of sporting activities *in situ*.

**Patterns of frequentation also socially differentiated**

Finally, the statistical analysis has evidenced strong contrasts in the stated perceptions and practices associated with Sainte-Victoire in relation to the responders' age and socio-professional category. Compared to other groups, students frequent Sainte-Victoire more rarely. The mountain did not play

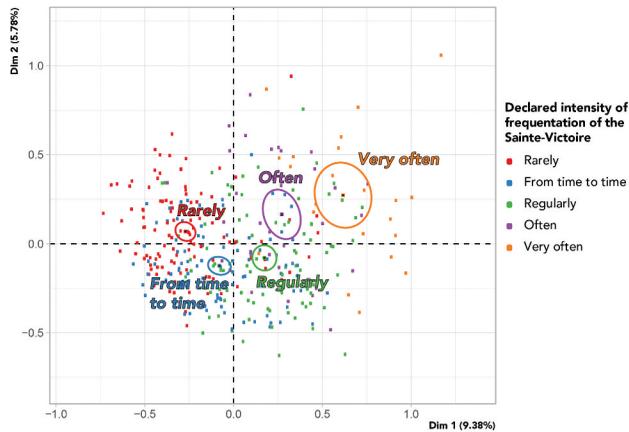


Figure 9. Declared intensity of frequentation of Sainte-Victoire variables and their respective confidence ellipses in the plane defined by dimensions 1 and 2 of MCA.

a role in determining their implantation in their municipality of residence. In contrast, elderly people have very specific experiences of the massif since they frequent it very often, in particular, for the purpose of hunting. This is also the category that shows the strongest tendency to prefer walking or other 'soft' transport to go to Sainte-Victoire. With the managerial class, they appear as the two categories who have for the most part chosen to settle in their municipality of residence for reasons related to the living environment and the landscape of Sainte-Victoire. Seventy-seven per cent of these retired people and managerial staff are homeowners. Sixty-four per cent own detached houses with a garden. Living in the outstanding landscape environment of Sainte-Victoire thus tends to be linked with the means to acquire ownership of a detached house.

## Discussion

The analysis of the data resulting from the survey has highlighted the existence of relatively unusual modes of lifestyle, residence and frequentation associated with Sainte-Victoire. The stated perceptions and the practices that result function in a spatially and socially differentiated manner, according to the distance to the mountain of the place of residence of the individuals surveyed. The survey carried out among the local residents and users of the GSCSV has shown that Sainte-Victoire is only very rarely visited by individuals who do not live in direct proximity to the mountain. Consistent with the initial hypothesis, Sainte-Victoire thus possesses, as a metropolitan mountain, certain characteristics which the literature assigns to the perceptions and practices of metropolitan green spaces with regard to the importance of the distance and the travel time from the home (Arrif, 2009; Grahn & Stigsdotter, 2003; Sanesi & Chiarello, 2006; Tremblay & Simard, 2011). The pertinence of this parallel is nonetheless strongly relativised by the rarity of the frequentation by most individuals. Whereas intra-urban parks remain for the most part associated with practices that are everyday and local, Sainte-Victoire shows a pattern of use that is more exceptional. This can be explained by the episodic nature of its frequentation and the heavy dependence on the car for access. In other words, if Sainte-Victoire does generate local patterns of use for the closest local residents, the distance remains a limiting factor for the emergence of patterns of frequentation within the register of daily life for a broader metropolitan public. These results thus raise some issues that shall be discussed in the light of the literature, but also in terms of landscape and urban planning strategies.

While the present study has shown that Sainte-Victoire is only very rarely visited by individuals who do not live in direct proximity to the mountain, improved accessibility by an adequate public

transport service associated with well-developed access to active modes nonetheless constitute a condition *sine qua non* for their regular frequentation by a broader public. Should this happen, this more intensive frequentation would nevertheless present a risk of a decline in the benefits afforded for the various users (Mieno et al., 2016). *A fortiori* in a context where the high frequentation and tourism pressure associated with this site are already seen as the main drawback from the point of view of the local populations. But the issue of the accessibility of this urban natural space cannot be reduced to a simple question of public transport services. It should also be considered in terms of residential mobility (Van Herzele et al., 2005). It has indeed been demonstrated that populations do not generally compensate for the lack of green spaces in their own zone of residence by more frequent visits to public parks or urban natural spaces (Grahm & Stigsdotter, 2003). In this regard, the analysis showed the existence of a strong statistical link between the expression of a reason for taking up residence in the territory associated with the presence of Sainte-Victoire and the fact of possessing a house with a garden. Echoing the international literature on the urban natural spaces (Brander & Koetse, 2011; Van Herzele & Wiedemann, 2003), also including the case of metropolitan mountains (Kim et al., 2017), the positive impact related to the proximity of an outstanding landscape environment on the residential dynamic and property prices is also perceptible in the case of Sainte-Victoire (Pinson, 2006). The question would then be to know whether this dynamic also generates forms of 'clubisation' (Charmes, 2011) or socio-environmental inequality (Van Herzele et al., 2005), dependent on disposing of the means to acquire property in this territory (Pinson & Thomann, 2002).

Recontextualised on the scale of the Aix-Marseille Provence Metropolis and its emerging vision of a metropolitan territory restructured around the numerous metropolitan mountains that characterise this unusual territorial context, the results obtained raise the issue of the degree of uniqueness of Sainte-Victoire. Sainte-Victoire indeed benefits from a range of protection measures and *ad hoc* management structures that enable the overall control of future patterns of change. In contrast, the protection of many other metropolitan mountains is solely based on the principles of the local urban planning (Consalès et al., 2012). For these other metropolitan mountains around which less strictly controlled urbanisation can develop, the question of the maintenance of access in the face of urban pressure is all the more important. In this respect, the risk of a two-speed scenario of change according to the level of protection of these geomorphological identity-conferring structures of the Aix-Marseille Provence Metropolis against urbanisation appears real.

In parallel to this question of access to these urban natural areas, there is also the question of the preservation of ecological continuity between these reservoirs of biodiversity identified in various local landscape and urban planning documents. The French Green and Blue Network policy (*Trame Verte et Bleue*) developed in 2009 requires greater consideration of ecological continuities in both municipal Local Urban Development Plans (PLU) and in inter-municipal Territorial Coherence Schemes (SCoT). Until recently, the identified continuities were mostly based on elements of nature that are already strongly protected: the mountains, the sea and watercourses. On the other hand, the ecological continuities passing through the urban matrix used to be formulated in a vague manner in these urban planning documents. This situation reflects the well-established difficulties of French urban planners (Clergeau, 2020) in dealing with intra-urban green spaces from a landscape ecology perspective. In this respect, the transition to governance by the Metropolis seems to mark a significant turning point for this territory. By upgrading governance to this new administrative level, the richness and diversity of spaces of a natural character seem to have had a much greater influence on the thinking behind the design of new planning schemes, such as the metropolitan SCoT and the Inter-municipal Urban Development Plan (PLU-I). These different schemes, which are still in the process of being developed, tend to use the landscape as the main entry point. The issue is therefore to examine the ways that the various structuring metropolitan green and urban natural spaces can be better coordinated in future planning and development operations (Consalès & Millias, 2020).

## Conclusion

The questionnaire-based survey carried out among 714 local residents and users of Sainte-Victoire has highlighted the existence of declared perceptions and practices that are spatially and socially differentiated. These are clearly organised in function of the distance of the place of residence from the mountain. In this respect, Sainte-Victoire possesses certain characteristics that the literature attributes to the perceptions and practices of intra-urban parks and gardens and to peri-urban forests. It differs from them, however, because of patterns of frequentation that fall within the register of the exceptional, in relation to its episodic frequentation, its specific uses and access that is strongly dependent on the car. While the potential to become vast public parks is increasingly attributed to metropolitan mountains of the Aix-Marseille-Provence Metropolis, the analysis tends to contrast a certain number of key issues with the emerging vision of a metropolitan territory restructured around its major mountains. In the case of Sainte-Victoire, these points arise in terms of accessibility by public transport services and active modes of transport. The distance from the place of residence is a decisive factor for their everyday frequentation by a broader public. A further landscape and urban planning issue concerns the questions of the maintenance of access for the populations and ecological continuity in the face of urban pressure, in particular, in the case of metropolitan mountains that have little protection under the planning measures.

In the light of these results and taking into account the various issues, the present article calls for the better coordination and enhanced complementarity of emblematic urban natural spaces, such as Sainte-Victoire, with all the other more ordinary intra-urban green spaces, such as public parks, squares and gardens that constitute the metropolitan territories to be considered. The integration of the diversity of ecosystem services provided by each of them is undoubtedly a question of prime importance for landscape and urban planning.

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## Notes on contributors

**Benoît Romeyer** is Associate Professor in urban planning at the Institute of Urban and Regional Planning and the LIEU UR 889 of Aix-Marseille Université. He received his PhD in urban planning in 2016. His research addresses landscape and urban planning projects at different spatial scales, with a particular interest in public space design and landscape planning. Currently, his research seeks to link these two topics by examining the capacity of the street network to support both urbanistic and ecological functions.

**Ruth Mpozagara** graduated with a master's degree in urban planning at the Aix-Marseille Université in 2020, and two years before with a bachelor's degree in applied economics at the Paris-Saclay University. Her academic career built her strong skills in data collecting, data processing using specialised software and writing studies. Currently, she is working as an economics study officer at the Essonne Chamber of Commerce and Industry.

**Jean Noël Consales** holds a doctorate in Geography and Regional Planning and was recruited in 2005 as an assistant professor at Aix-Marseille Université. Since 2012, he has been a teacher-researcher at the Institute of Urban and Regional Planning. Since 1999, he is attached to the UMR 7303 Telemme (AMU-CNRS) where he is in charge of the "Landscapes, public policies and development projects" group. He conducts research on the mobilisation of nature in land use, urban

planning and landscape projects, at different spatial scales. His work tends to fall within the emerging field of more-than-human geography, which he questions in its most applied dimension, thanks to three strongly interrelated conceptual and operational fields: landscape sciences; landscape and ecological planning; urban agriculture.

## ORCID

Benoit Romeyer  <http://orcid.org/0000-0002-6959-2740>

Jean Noël Consales  <http://orcid.org/0000-0003-2401-854X>

## References

- AGAM. (2017). *Aix-Marseille-Provence, un capital nature et littoral à partager*. Agence d'urbanisme de l'Agglomération Marseillaise.
- Arnould, P., Le Lay, Y.-F., Dodane, C., & Méliani, I. (2011). La nature en ville : L'improbable biodiversité. *Géographie, économie, société*, 13(1), 45-68. <https://doi.org/10.3166/ges.13.45-68>
- Arrif, T. (2009). Les représentations sociales liées au lieu de résidence au sein du parc de Bercy. *Métropoles*, 5. <https://doi.org/10.4000/metropoles.3876>
- Aschan-Leygonie, C., Bonnaud, A., & Girault, C. (2015). Quand la situation urbaine favorise la protection des espaces naturels: Le cas de Göteborg (Suède). *Cybergeo : European Journal of Geography*. <https://doi.org/10.4000/cybergeo.27258>
- Ascher, F. (1995). *Métapolis ou L'avenir des villes*. Odile Jacob.
- Boutefeu, E. (2009). La demande sociale de nature en ville. Enquête auprès des habitants de l'agglomération lyonnaise. *Urbia*, 8(8), 21-38. [https://www.unil.ch/files/live/sites/ouvdd/files/shared/URBIA/urbia\\_08/urbia\\_08\\_p021\\_038.pdf](https://www.unil.ch/files/live/sites/ouvdd/files/shared/URBIA/urbia_08/urbia_08_p021_038.pdf)
- Brander, L. M., & Koetse, M. J. (2011). The value of urban open space : Meta-analyses of contingent valuation and hedonic pricing results. *Journal of Environmental Management*, 92(10), 2763-2773. <https://doi.org/10.1016/j.jenvman.2011.06.019>
- Charmes, E. (2011). *La ville émietée : Essai sur la clubbisation de la vie urbaine*. Presses universitaires de France.
- Clergeau, P. (Ed.). (2020). *Urbanisme et biodiversité. Vers un paysage vivant structurant le projet urbain*. Éditions Apogée.
- Consalès, J. N., Goiffon, M., & Barthélémy, C. (2012). Entre aménagement du paysage et ménagement de la nature à Marseille : La trame verte à l'épreuve du local. *Développement durable et territoires*, 3(2), 2. <https://doi.org/10.4000/developpementdurable.9268>
- Consalès, J. N., & Millias, A. (2020). *Aix-Marseille Provence : Une Métropole-Jardin*. Urbanités.
- Decoupigny, F. (2007). Métropolisation des espaces naturels et indicateurs de localisation résidentielle en région Provence-Alpes-Côte-d'Azur. *Revue d'Economie Régionale et Urbaine*, 2007(4), 589-607. <https://doi.org/10.3917/reru.074.0589>
- Dematteis, G. (2018). The alpine metropolitan-mountain faced with global challenges. Reflections on the case of turin. *Journal of Alpine Research | Revue de Géographie Alpine*, 106(2). <https://doi.org/10.4000/rga.4402>
- Depraz, S. (2008). *Géographie des espaces naturels protégés*. Armand Colin.
- Descola, P. (2005). *Par-delà nature et culture*. Gallimard.
- Fourault-Cauët, V. (2017). Introduction. Urban natures. *Articulo - Journal of Urban Research*, 16. <https://doi.org/10.4000/articulo.3302>
- Fourny, M.-C. (2018). Métropoles alpines. Vers une nouvelle alliance entre villes et montagnes? *Journal of Alpine Research | Revue De Géographie Alpine*, 106(2). <https://doi.org/10.4000/rga.4216>
- Girault, C. (2017). Between naturalness and urbanity, how are protected areas integrated into cities? The case of Helsinki (Finland). *Articulo - Journal of Urban Research*, 16. <https://doi.org/10.4000/articulo.3270>
- Grahn, P., & Stigsdotter, U. A. (2003). Landscape planning and stress. *Urban Forestry & Urban Greening*, 2(1), 1-18. <https://doi.org/10.1078/1618-8667-00019>
- Husson, F., Lê, S., & Pagès, J. (2016). *Analyse de données avec R (PUR)*.
- Jarvis, I., Gergel, S., Koehoorn, M., & Van Den Bosch, M. (2020). Greenspace access does not correspond to nature exposure: Measures of urban natural space with implications for health research. *Landscape and Urban Planning*, 194. <https://doi.org/10.1016/j.landurbplan.2019.103686>
- Kim, J., Park, J., Yoon, D. K., & Cho, G.-H. (2017). Amenity or hazard? The effects of landslide hazard on property value in Woomyeon nature park area, Korea. *Landscape and Urban Planning*, 157, 523-531. <https://doi.org/10.1016/j.landurbplan.2016.07.012>
- Lê, S., Josse, J., & Husson, F. (2008). FactoMineR : An R package for multivariate analysis. *Journal of Statistical Software*, 25(1), 1-18. <https://doi.org/10.18637/jss.v025.i01>
- Mathevet, R., & Godet, L. (Éds.). (2015). *Pour une géographie de la conservation : Biodiversités, natures et sociétés*. L'Harmattan.

- McDonald, R. I., Forman, R. T. T., Kareiva, P., Neugarten, R., Salzer, D., & Fisher, J. (2009). Urban effects, distance, and protected areas in an urbanizing world. *Landscape and Urban Planning*, 93(1), 63-75. <https://doi.org/10.1016/j.landurbplan.2009.06.002>
- Mieno, T., Shoji, Y., Aikoh, T., Arnberger, A., & Eder, R. (2016). Heterogeneous preferences for social trail use in the urban forest: A latent class model. *Urban Forestry & Urban Greening*, 19, 20-28. <https://doi.org/10.1016/j.ufug.2016.06.016>
- Millennium Ecosystem Assessment. (2005). *Ecosystems and human well-being*. Island Press.
- Papillon, P., & Dodier, R. (2011). Les forêts périurbaines : Des usages récréatifs à l'espace prophylactique. *Journal of Alpine Research | Revue De Géographie Alpine*, 106(2). <https://doi.org/10.4000/rga.1562>
- Park, K. (2017). Psychological park accessibility: A systematic literature review of perceptual components affecting park use. *Landscape Research*, 42(5), 508-520. <https://doi.org/10.1080/01426397.2016.1267127>
- Perlik, M. (2019). *The spatial and economic transformation of mountain regions. Landscapes as commodities*. Routledge.
- Pinson, D. (2006). La Faute à Cézanne? A propos de la perception du pays d'Aix par ses nouveaux habitants de villas. In A. Berque, P. Bonnin, & C. Ghorra-Gobin (Eds.), *La ville insoutenable* (pp. 56-66). Belin.
- Pinson, D., & Thomann, S. (2002). *La Maison en ses territoires*. L'Harmattan.
- R Core Team. (2020). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Sanesi, G., & Chiarello, F. (2006). Residents and urban green spaces: The case of Bari. *Urban Forestry & Urban Greening*, 4(3), 125-134. <https://doi.org/10.1016/j.ufug.2005.12.001>
- Sansot, P. (2003). *Jardins publics*. Payot & Rivages.
- Sever, I., & Verbič, M. (2018). Providing information to respondents in complex choice studies: A survey on recreational trail preferences in an urban nature park. *Landscape and Urban Planning*, 169, 160-177. <https://doi.org/10.1016/j.landurbplan.2017.09.003>
- Takano, T., Nakamura, K., & Watanabe, M. (2002). Urban residential environments and senior citizens' longevity in megacity areas: The importance of walkable green spaces. *Journal of Epidemiology and Community Health*, 56(12), 913-918. <https://doi.org/10.1136/jech.56.12.913>
- Théry, L., Baduel, M., Béhar, D., & Espinas, J.-D. (2016). *La Métropole par le projet : Aix - Marseille - Provence*. Parenthèses.
- Tremblay, M.-H., & Simard, M. (2011). Les effets de proximité dans l'appropriation collective d'un grand parc paysager à saguenay. [VertigO] *La revue électronique en sciences de l'environnement*, 11(2), 2. <https://doi.org/10.4000/vertigo.11098>
- Tryzna, T. (2014). *Urban Protected Areas—Profiles and best practice guidelines*. IUCN.
- Tyrväinen, L., Mäkinen, K., & Schipperijn, J. (2007). Tools for mapping social values of urban woodlands and other green areas. *Landscape and Urban Planning*, 79(1), 5-19. <https://doi.org/10.1016/j.landurbplan.2006.03.003>
- Van Herzele, A., De Clercq, E. M., & Wiedemann, T. (2005). Strategic planning for new woodlands in the urban periphery: Through the lens of social inclusiveness. *Urban Forestry & Urban Greening*, 3(3), 177-188. <https://doi.org/10.1016/j.ufug.2005.01.002>
- Van Herzele, A., & Wiedemann, T. (2003). A monitoring tool for the provision of accessible and attractive urban green spaces. *Landscape and Urban Planning*, 63(2), 109-126. [https://doi.org/10.1016/S0169-2046\(02\)00192-5](https://doi.org/10.1016/S0169-2046(02)00192-5)
- Vidal-Naquet, P. (1992). Genèse d'un haut lieu. *Méditerranée*, 75(1), 7-16. <https://doi.org/10.3406/medit.1992.2749>
- Watson, J. E. M., Dudley, N., Segan, D. B., & Hockings, M. (2014). The performance and potential of protected areas. *Nature*, 515(7525), 67-73. <https://doi.org/10.1038/nature13947>