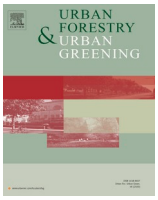
Urban Forestry & Urban Greening 73 (2022) 127598

Contents lists available at ScienceDirect

Urban Forestry & Urban Greening

journal homepage: www.elsevier.com/locate/ufug



Similar spaces, different usage : A comparative study on how residents in the capitals of Finland and Denmark use cemeteries as recreational landscapes

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ARTICLE INFO

Handling Editor: Wendy Chen

Keywords:
Green space popularity
Nature experience
Physical activity
Social interactions
Spirituality
Supply and demand

ABSTRACT

Several studies from the Nordic countries show that cemeteries not only fulfil an important societal function as places for the disposal of bodily remains; they are also recreational landscapes that people visit to reflect, experience nature or perhaps go for a walk with the dog. In this comparative study, based on PPGIS data collected between 2018 and 2020 from residents in Copenhagen (Denmark) and Helsinki (Finland), we explored the extent to which residents use urban cemeteries as everyday recreational landscapes. We also assessed users' characteristics and the values they attached to the cemeteries. The results show that several of Copenhagen's cemeteries were actively used for recreation, while those in Helsinki were used much less frequently for this purpose. Of the total 7276 mapped visiting points in Copenhagen, 16.5% were located within cemeteries, compared with 1.9% of the 4298 mapped visiting points in Helsinki, hence conclusions from Helsinki should be drawn with caution. Physical activity and experiencing nature were the most common values attached to cemeteries in Copenhagen, whereas social interaction, spirituality and tranquillity were most common for Helsinki cemeteries. The results also revealed that younger Danes were particularly inclined to use cemeteries for social interactions, physical activity and spirituality and tranquillity. In the discussion, we elaborate on spatial differences between the cases, such as the availability of other green spaces, the size of cemeteries or people living in proximity to a cemetery, as well as on differences in policies and practices, including how Copenhagen stands out in actively promoting municipal cemeteries as recreational landscapes.

1. Introduction

In the last decade, the recreational use of cemeteries is an issue that has attracted increasing interest with respect to research, policy and practice in the Nordic countries (see for example Grabalov and Nordh, 2020). On a local level, there are examples of cemeteries that aim to attract neighbouring residents through different measures, including integrating park features such as a sensory garden, bike routes and lawns for sunbathing between graves of historical significance, as in Assistens cemetery in Copenhagen (Copenhagen Municipality, 2019a, 2019b), or the air movie event at Malmi cemetery in Helsinki (Helsinki Parish Union, 2019). However, the recreational use of cemeteries can be problematic as it may violate the peaceful atmosphere found in these unique green spaces. Every now and then, posts appear in social media or newspapers from people upset about what they consider inappropriate behaviour at cemeteries. For example, in Copenhagen, during April or early May, hundreds of thousands of visitors come to Bispebjerg cemetery to experience and take photos of the alley of Japanese cherry blossom trees (Bachmann, 2018), something that causes tensions with mourners, many of whom desire a peaceful experience when visiting a grave. Likewise, in Helsinki, problems are caused by the high number of tourists that wish to visit the graves of particular celebrities (Östman, 2014). Similar examples can also be found in other Scandinavian countries, such as children sledding on the snow in the famous Skogskyrkogården, The Woodland Cemetery, in Stockholm Sweden (Scheutz, 2021), or youths sunbathing or playing badminton at a Norwegian cemetery (NTB, 2008). Whether the recreational uses of cemeteries are perceived as inappropriate and provocative depends on the type of

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https://doi.org/10.1016/j.ufug.2022.127598
Received 3 January 2022; Received in revised form 5 April 2022; Accepted 2 May 2022
Available online 6 May 2022

activity but also on the type of cemetery and, not least, its location (Evensen et al., 2017; Nordh et al., forthcoming). It is also plausible that individual characteristics such as cultural traditions, religious affiliation and experience with loss might have an impact on how people perceive and use cemeteries (Nordh et al., forthcoming). To the best of our knowledge, there are no existing studies exploring the identity of cemetery users and the purposes for which they visit cemeteries.

Even though tensions can arise around how cemeteries are or should be developed (Nielsen and Groes, 2014), it is evident that their recreational use is a topic on the funerary practice agenda in the Nordic countries. For example, some cities, such as Copenhagen and Oslo, have published policy documents detailing strategies for how to develop cemeteries into recreational landscapes (Copenhagen Municipality, 2015; Oslo Municipality, 2017). The reason these policy documents exist is partly explained by the recreational activities that are already taking place at some urban cemeteries (Grabalov and Nordh, 2020). The recreational use of cemeteries has also been a recurring topic in several of the seminars organised by the *Nordic Network for Cemeteries and Crematoria* the last few years. There are several researchers interested in how people perceive or use cemeteries, or similar burial sites, both internationally (Deering, 2010; Goh and Ching, 2020; Huang, 2007, Quinton et al., 2019, 2020; Woodthorpe, 2011) and in the Nordic countries (Nordh et al., 2017; Skår et al., 2018; Swensen et al., 2015; Evensen et al., 2017; Grabalov, 2018; Rae, 2021). However, to the best of our knowledge, there is a lack of studies from Denmark and, particularly, Finland. Most of the studies referred to above build on qualitative case studies with a limited number of informants; hence, there is a need for a broader sample of data collected from the general public.

In this paper, we explore the extent to which and how residents in Copenhagen and Helsinki use urban cemeteries as part of their everyday outdoor environment. Furthermore, we investigate the relationships between the use of cemeteries and demographics such as age, gender and households with children. The aim is to expand existing knowledge about how people use cemeteries for recreation, the identity of the users, and the particular values that people associate with cemeteries. This information could inform cemetery policy and management practice. Furthermore, the comparison is aimed at broadening the current Nordic literature on cemetery research by providing new insights from Denmark and Finland.

2. Method

This study was conducted as a comparative case study, following Yin (2003). This type of case study is according to Yin (2003) especially applicable, when questions such as *how* or *why* are addressed, in complex social phenomena. We chose this approach to cover the contextual conditions of how people use cemeteries for recreation in both Helsinki and Copenhagen, as well as which place values people associate with cemeteries. In the following method chapter, we will present the two cases, describe data collection and the comparative PPGIS analyses conducted.

2.1. Presenting the cases

Denmark and Finland are two Nordic countries with populations that are similar in size (around 5.5 million). Both are secular or post-secular countries shaped by Evangelical Lutheran traditions (Høeg and Pajari, 2013). However, in both countries, the churches are losing ground (Evangelical Lutheran Church of Finland 2021; Folkekirkens Uddannelses og Videnssenter, 2021) as a result of secularisation and, potentially, also immigration (Kääriäinen, 2011). In Denmark, 73.8% of the population belongs to the Church in Denmark (Church in Denmark, 2021). In Finland, 67.6% are members of the Evangelical Lutheran Church of Finland (ELCF) (Evangelical Lutheran Church of Finland, 2021). These similarities lay the foundation for interesting comparisons across the two capitals.

2.2. The national and local context – Denmark/Copenhagen

Almost all cemeteries in Denmark belong to the Evangelical Lutheran Church (the Church in Denmark). As prescribed by Danish legislation, municipalities and other religious communities are allowed to establish their own cemeteries, but there are few of these. Hence, both members and non-members of the Church in Denmark are buried in the same cemeteries (Ministry of the Church, 2021), most of which are managed by the Church in Denmark (Kjøller, 2012). However, the Church has delegated its management to certain municipalities (Ministry of the Church, 2021), such as in Copenhagen where the municipality is the responsible unit for five out of eight cemeteries (Grabalov and Nordh, 2020). Denmark has the highest cremation ratio in Scandinavia. In 2019, 85.5% of Danes chose cremation (Burial and cremation services in Sweden, 2020), and the statistic for Copenhagen exceeds 90% (Grabalov and Nordh, 2020). As a consequence of these high ratios and the reuse of grave spaces, some cemeteries in Copenhagen have a surplus of the latter. On their web page, Copenhagen Municipality presents a description of cemeteries as 'beautiful green areas that accommodate cultural and recreational experiences' (Copenhagen Municipality, 2021), accompanied by an image of a couple relaxing on the lawn in a cemetery. They also literary invite people to visit their cemeteries for recreational purposes. Elsewhere, in the municipal plan, cemeteries are presented as green resources in the city (Copenhagen Municipality, 2019a, 2019b). In 2015, Copenhagen Municipality published a policy document on the development of cemeteries with a time frame extending to 2065 (Copenhagen Municipality, 2015). Just by looking at the images in the policy document, the connection between cemeteries and recreation becomes clear: there are several images of people in cemeteries sunbathing, biking and walking with prams.

The six Danish cemeteries explored in this study are located in, or nearby, the central part of the city (Fig. 1) and in the same city districts as where the survey were distributed (see the section PPGIS data from Copenhagen). They are highly vegetated, walled garden- or park-like spaces with numerous trees, bushes and perennials (Figs. 2–4); the gates are open from 7 a.m. to 10 p.m. (opening hours are shorter in winter). Burial and provision for cremated remains are available at all cemeteries; some also offer columbaria (Bispebjerg and Sundby). Furthermore, some of the cemeteries have particular sections for certain denominations, such as the Muslim and Orthodox communities (In Table 1 we give a brief description of the cemeteries explored in the study).

2.3. The national and local context – Finland/Helsinki

In Finland, almost all cemeteries are owned and managed by the ELCF; however, other religious communities and associations, as well as municipalities, are allowed to run cemeteries (Kääriäinen, 2011). According to the Burial Act (Hautaustoimilaki Finnish, 2003), cemeteries managed by the ELCF are public and must offer graves to all denominations. Furthermore, neither cemeteries nor crematoria should be for-profit. Cremation statistics shows that about 57% of Finns choose cremation (Burial and cremation services in Sweden, 2020); however, the percentage varies across the country, with higher levels of cremation in larger cities and less in the countryside (Westergård, 2020), which is a pattern observed all over Scandinavia (Burial and cremation services in Sweden, 2020. In Finland, as well as in the other Nordic countries, graves are reused if left unattended for several years or if relatives do not prolong the grave rights; this means that most cemeteries (with a few exceptions) are never filled.

There are five active cemeteries in Helsinki: two main ones (Malmi and Hietaniemi), two small cemeteries where services are restricted to only the residents of that neighbourhood, and one cemetery which is solely a columbarium. All of these cemeteries belong to the ELCF. At Hietaniemi cemetery, separate sections are provided for the Islamic, Jewish and Orthodox communities, and in particular, the St. Nicholas

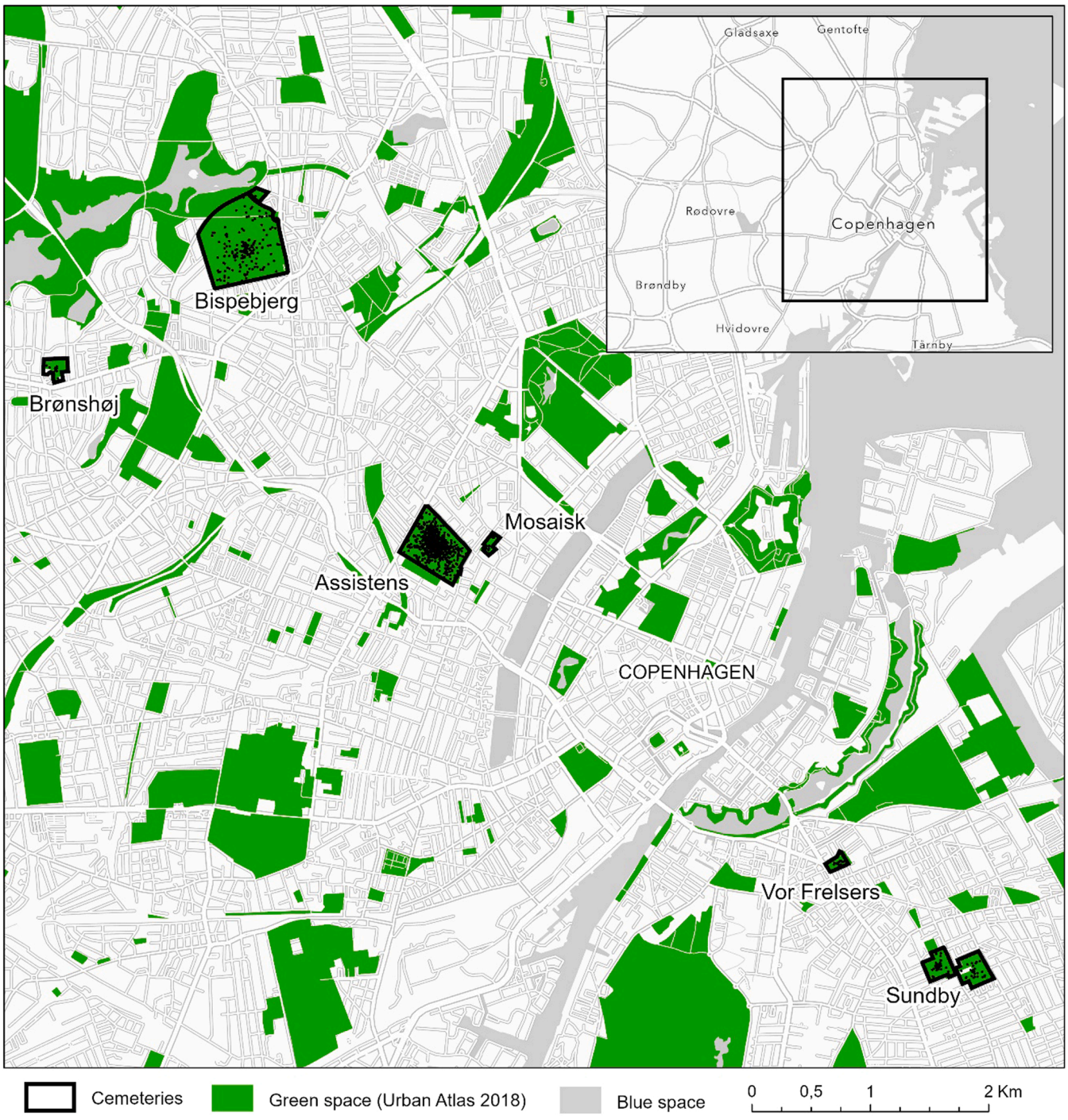

Fig. 1. The distribution of the six examined cemeteries in Copenhagen, and the green and blue spaces included in the supply and demand analysis. The black dots represent the 1201 visiting points that were mapped in the cemeteries in the Copenhagen survey.

Orthodox Parish.

In this paper, we focus on the two large active cemeteries in Helsinki, Hietaniemi, near the city centre, and Malmi, a bit further away from the city centre, as well as Vanha kirkkopuisto, a former cemetery that currently serves as a park (Figs. 5–7 and Table 1). Hietaniemi and Malmi are both highly vegetated spaces with different sections lined with large trees and organised with bushes, flowers and perennials. Unlike most cemeteries in Finland, there are several mausoleums in Hietaniemi cemetery. Both cemeteries also have a chapel for funeral services. Malmi cemetery additionally has two cafeterias and several rooms available for memorial events. Both cemeteries are walled, and the gates are open from 7 a.m. to 10 p.m. all year round.

While active cemeteries in Helsinki are not explicitly designated for recreational purposes, the ELCF organises walking tours and cultural events in the cemeteries, and Hietaniemi cemetery serves as a tourist attraction due to the number of important public figures buried there. Independent tours for tourists are held on the premises, and 'Artists' Hill', where many prominent 20th century artists are buried, is an especially popular visitor attraction.

Vanha kirkkopuisto (*Old Church Park*), also known as Ruttopuisto (*Plague Park*), served as a cemetery between 1790 and 1829. From that period, 48 graves remain in the cemetery. The cemetery was abandoned

Fig. 2. People relaxing on a lawn in Sundby cemetery (photo: Anton S. Olafsson).

Fig. 3. Walking at Brønshøj cemetery (photo: Søren Præstholm).

Fig. 4. Opening up Bispebjerg cemetery to locals is in accordance with current strategy. Here the wall has been made permeable, a new entrance created, and a small pocket park atmosphere designed in order to draw people into the cemetery (photo: Søren Præstholm).

after it closed, but once the city expanded to the west, it was designated as a park (City of Helsinki Urban Environment, 2020). Two new graves for soldiers were added during the Finnish Civil War in April 1918. The park was renovated into its current appearance in 1998, and the gravestones were restored in 2021 (Antila, 2021). Today, Vanha kirkkopuisto is an important public green space in the centre of the city and is used for diverse small-scale events, such as flea markets, art events or student gatherings (City of Helsinki, 2021). Most activities are unorganized and informal, but during the Helsinki night of arts organized events or small performances may take place in the cemetery (Fig. 8).

2.4. Collecting participatory GIS data

The study builds on public participation GIS (PPGIS) methodology (Brown et al., 2020). PPGIS refers to a group of participatory mapping methods developed for capturing citizen-produced spatial information. PPGIS tools operate typically on digital platforms thus enabling the collection, analysis, and storage of non-expert spatial knowledge directly in a geographic information system. The present study uses data from two PPGIS surveys collected in Copenhagen and Helsinki in the period 2018–2020. Two separate PPGIS studies were designed with distinct aims and objectives; however, both studies collected data about how residents use their everyday outdoor environments and the spaces that are important to them. Consequently, the data collection did not focus on cemeteries per se; instead, the results are grounded in people's actual use of cemeteries as one of many types of outdoor spaces in their everyday lives. Information about visitors' place values and activities attached to visiting points located in cemeteries was retrieved from the data pertaining to both Copenhagen and Helsinki (for more on the methods applied in each case, see the following sections). We were also interested in exploring whether the use of respective cemeteries as outdoor spaces was related to the spatial context of each cemetery. In the next section, we examine how this spatial context is included in the study.

2.5. Analysis of potential supply and demand

The use of cemeteries as recreational spaces is rooted in various individual needs and traditions (Nordh et al., forthcoming); however, it may also be related to the distribution of alternative recreational spaces. Hence, recreational use can be conceptualised as an outcome of the supply of recreational opportunities and the demand for recreation (Jenkins and Pigram, 2006). Many possible supply and demand variables have been used in studies of spatially explicit recreational use of green spaces (Hegetschweiler et al., 2017). Here, we are inspired by studies of urban ecosystem services (e.g. Cortinovis and Geneletti, 2020) in conceiving potential supply as the share of alternative recreational spaces around the cemeteries. We therefore calculated percentages of all green and blue spaces (spaces that are typically used for recreational purposes) in two different distance zones from the cemeteries, 0–300 m (the distance between home and green space recommended by WHO, 2017) and 301–600 m, to capture the wider spatial context around the cemeteries. We used an aggregation of the *Urban Atlas 2018* blue and green land-use classes (above code 13,300) to determine green and blue spaces. The potential demand was calculated for the same distance zones as a simple population number (number of residents) for each zone. For Copenhagen, we used spatial population data at a 100 m grid resolution made available by Statistics Denmark (2019). In Helsinki, the potential demand was calculated using building-level population data (HSY, 2018). Potential supply and potential demand were related to the density of mapped visiting points (visiting points per hectares) within cemeteries by nonparametric correlation measures (Spearman's rho).

2.6. Comparative analysis of PPGIS data

First, we counted and compared the total number of visiting points in

Table 1
An overview of the selected cemeteries in the two case cities.

Name	Management	Active burial ground (yes/no)	Opening hours (winter / summer)	Size (ha)	Walled (yes/no)
Copenhagen					
Brønshøj	Municipality	Yes	07:00–22:00 (07:00–19:00 in winter)	3.0	Yes
Bispebjerg	Municipality	Yes	07:00–22:00 (07:00–19:00 in winter)	42.9	Yes
Assistens	Municipality	Partly (only ⅕ of the cemetery)	07:00–22:00 (07:00–19:00 in winter)	20.4	Yes
Nørre Mosaisk	The Jewish Community in Denmark	No	08:00–20:00 (07:00–19:00 in winter)	1.3	Yes
Vor Frelsers	Church of Denmark	Yes	07:00–20:00 (08:00–16:00 during winter)	1.6	Yes
Sundby	Municipality	Partly (old part is being converted to park)	07:00–22:00 (07:00–19:00 in winter)	10.6	Yes
Helsinki					
Hietaniemi	Evangelical Lutheran Church of Helsinki	Yes	07:00–22:00	31.3	Yes
Malmi	Evangelical Lutheran Church of Helsinki	Yes	07:00–22:00	50.2	Yes
Vanha kirkkopuisto	Municipality	No	n/a	2.0	No

each cemetery in relation to all visiting points mapped by participants as a measure of popularity of cemeteries as recreational spaces. Since, both data sets included demographics of the participants: their age, gender and households with children (Table 3), we assessed the differences between the demographics of the cemetery users with focus on types of place values mapped by Chi-square tests. Four overarching categories of place values were used for this comparative analysis:

1. places for social interactions,
2. places for nature experiences
3. places for physical activity, and
4. places for spirituality and tranquillity.

The selection of overarching categories were based on available items in the individual PPGIS studies (Table 2, Appendices 1 and 2). This selection was supported by literature on qualities assigned to Nordic cemeteries in which it has been shown that cemeteries were used for restorative purposes, including reflection and contemplation (Nordh et al., 2017), social interaction, experiences of nature and different kinds of physical activities (Evensen et al., 2017, Skår et al., 2018). Furthermore, the categorisation was inspired by frameworks explaining associations between green space usage and people's health (Lachowycz and Jones, 2013; Hartig et al., 2014). In these frameworks social interaction, physical activity, mental restoration were key mechanisms explaining the link between nature and people's health and well-being. The grouping into four categories provided the possibility of comparing the purposes for which people use cemeteries and how they may differ across the two cities.

2.7. PPGIS data from Copenhagen

The PPGIS data used for the Copenhagen case study were collected between May and July 2020. The original purpose was to document outdoor recreation during the Covid-19 pandemic (Præstholm et al., 2021), however the majority (75%) of the mapped visiting points were categorised as 'normal visited places' by participants, hence although the data is influenced by changed outdoor behaviours due to the pandemic, the data mainly reflects everyday outdoor use behaviours. Members of citizen panels in five local districts in Copenhagen Municipality were invited via email to participate in the survey. The panels consisted of adults who voluntarily signed up for the panel. The panel sizes were between 1.0% and 2.8% of the local population across the five districts, and the response rates between 19.8% and 32.3%. All six cemeteries shown in Fig. 1 are located in one of the five local districts where the survey was distributed.

The participants were asked to map as a point feature places where they normally spent time outside. We do not know if respondents mapped the exact location of the activity, or put the marker randomly within the cemetery. However, for the purpose of this paper the exact location within the cemetery is of less importance, instead the focus is on what type of activities people do at cemeteries. For each mapped visiting point a pop-up question was included with a list of 19 place activities and place experiences associated with the visiting points. From this list the participants could choose one or several activities and values (Appendix 1). For the purpose of this comparative study, the values were grouped according to the four main themes (see the *Comparative analysis* section). If someone chose several uses for the same visiting point e.g. Biodiversity and Close to nature, both recoded to Places for nature experiences, then it was counted as one instance. The respondents mapped two places they had visited on average; altogether, 4992 respondents replied to the survey.

2.8. PPGIS data from Helsinki

The PPGIS data used in the Helsinki case study were collected in a research project focusing on the health-promotive characteristics of urban environments. The data collection took place between August and September 2018 in the Helsinki Metropolitan Area, Finland. This area consists of the municipalities of Helsinki, Espoo, Vantaa and Kauniainen and has a population of 1.2 million inhabitants; it forms the largest urban area in Finland (Official Statistics of Finland, 2019). A random sample of 10,000 adult inhabitants (ages 18–65) living permanently in the study area was obtained from the Finnish Population Register Centre. The sample members received a letter of invitation to participate in the online PPGIS survey.

The respondents were instructed to think of places that they frequently visited for leisure-time and recreational use at least once a month at the time of the year of the data collection and to mark them as point features on the basemap in the survey's mapping view. In a follow-up question, they indicated the activity taking place there, using seven pre-defined categories (Appendix 2). For the purpose of the present study, the categories were reclassified (see the *Comparative analysis* section) to comply with the study objectives and the Copenhagen data. Similar to the Copenhagen survey we do not know if respondents mapped the exact location of the activity, or put the marker randomly within the cemetery. In addition, the respondents were requested to map and report several socioeconomic and demographic background characteristics, including age, gender and household structure. Altogether, 1583 respondents participated in the survey, yielding a response rate of 16%.

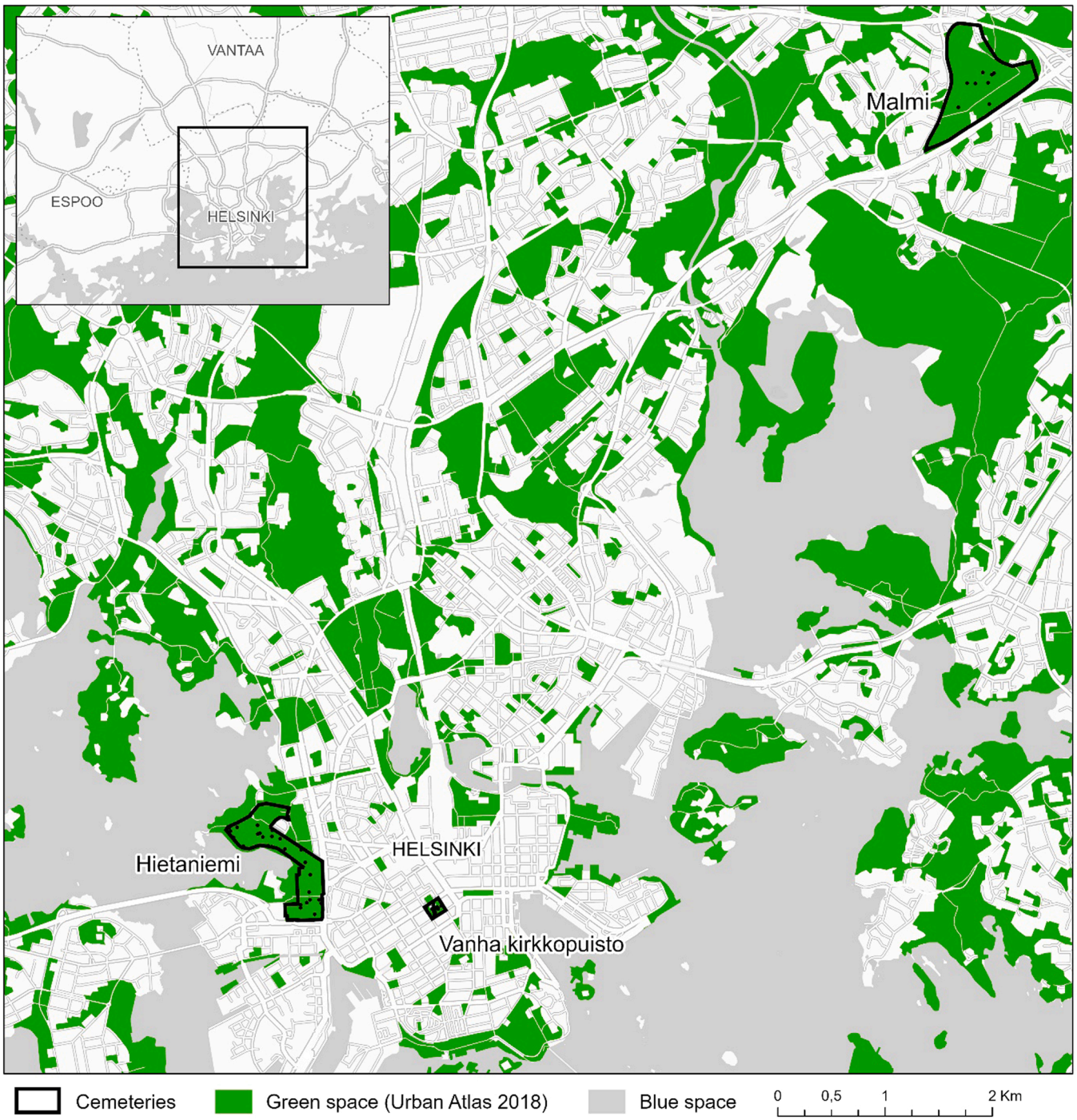

Fig. 5. This map shows the distribution of the three examined cemeteries in Copenhagen. Furthermore, it shows the green and blue spaces included in the supply and demand analysis. The black dots represent the 82 visiting points that were mapped in the cemeteries in the Finish survey.

3. Results

3.1. Popularity of cemeteries as outdoor recreational spaces

In the Copenhagen survey, a total of 7276 visiting points were mapped by respondents. Of these, 1201 visiting points (16.5%) were mapped in the six cemetery case sites across the city. This overall result contrasts significantly with that of Helsinki, where a total of 4298 visiting points were mapped, but only 1.9% fell within the three cemetery study sites in that city. When exploring the visiting points within cemeteries, we noticed that two Danish cemeteries stood out from the rest. Assistens cemetery was the cemetery with the most visiting points (N = 899), followed by Bispebjerg cemetery (N = 188) (Table 3). These two cemeteries are also the largest in area size, resulting in a significant positive correlation between mapping frequency and size of cemeteries in Copenhagen (Spearman's rho =0.886, $p = 0.0199$ *). However, this is not the case in Helsinki, where the largest cemetery, Malmi, is many times larger than the two other Helsinki cemeteries but was mapped the least by respondents.

3.2. Potential supply and potential demand

The calculated percentages of green and blue spaces within 300 m from the cemeteries (potential supply) show that one of the Danish

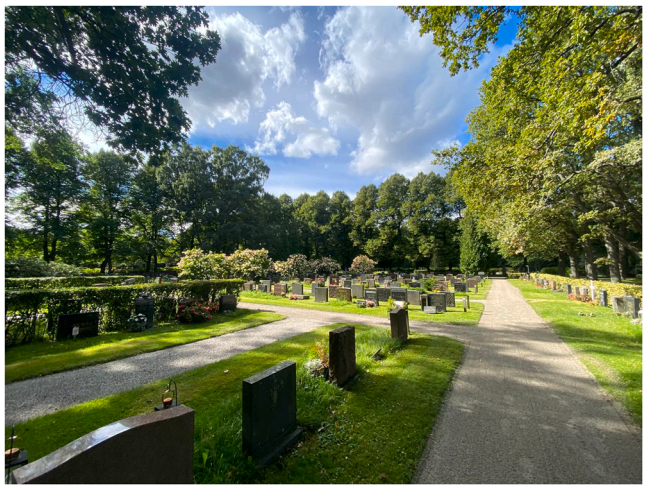

Fig. 6. Routes in Malmi cemetery (photo: Saana Rossi).

Fig. 7. The new section of Hietaniemi cemetery (photo: Saana Rossi).

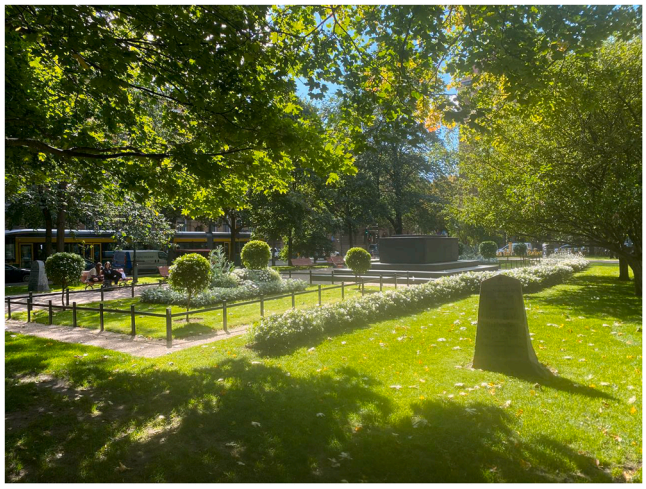

Fig. 8. Gravestones, memorials and vegetation in Vanha kirkkopuisto park (photo: Saana Rossi).

cemeteries (Bispebjerg) and two of the three Finnish cemeteries (Hietaniemi and Malmi) are surrounded by a high proportion of other green and blue spaces as compared to the other cemeteries (Table 3). The same

Table 2
An overview of how original place values were grouped into for main groups.

Place values (main group). Places for:	Place values in Helsinki	Place values in Copenhagen
Social interactions	Enjoy urban life	Being with Family
	Spend time with family or friends	Friends
		Picnic
	Meet good people	Play with Children
Nature experiences	Enjoy nature	Biodiversity
		Close to nature
		Aesthetic view
		Nature sounds
		Observe nature
		Nice smells
		Closeness to Water
Physical activity	Leisure-time physical activity	Walk/stroll
		Exercise/Sport
		Dog Walking
Spirituality and tranquility	Escape stress	Relax recharge
	Relax	Feelings/Inspiration/ Surprise
		Spiritual

pattern appears even when we analyse the supply of blue and green spaces a bit further away from the cemeteries (301–600 m). Hence, from a visitor perspective, these cemeteries all have alternative green spaces close by, in contrast to the most popular cemetery, Assistens cemetery in Copenhagen, with a potential supply of only 10% alternative green and blue spaces in both distance zones. This indicates a potential negative relationship between the popularity of cemeteries and the supply of alternative green spaces. This relationship was confirmed by nonparametric correlations comparing the percentages of potential supply with the density of visiting points per hectare in both cities. Within 300 m of cemeteries, we found a negative, but not significant, correlation of 0.4333 (Spearman's rho), and from 301 to 600 m, a negative and significant correlation (rho =−0.7333, $p = 0.025$ *) between the density of visiting points and potential supply.

When assessing potential demand (the number of residents within 300 m of the cemetery), we notice that the Danish cemeteries (except for Brønshøj) are located in more densely populated areas than are the Finnish cemeteries. Assistens cemetery is by far the cemetery with the highest potential demand. However, the picture changes slightly when we assess the demand within 301–600 m of the cemetery. For example, we noticed that Hietaniemi and, to some extent, Vanha kirkkopuisto cemeteries had rather high potential demand. The density of visiting points was positively correlated with the potential demand for cemeteries in both cities in the 301–600-meter zone but only significant for the cemeteries in Copenhagen within the 300-meter zone (rho =.886, $p = 0.019$ *).

3.3. Use and meaning of cemeteries in people's everyday life

Spirituality and tranquillity were equally important in both cities, with 65% of all visiting points in Copenhagen and 70% of all visiting points in Helsinki (Fig. 9). But there were also significant differences in shares of place values between the two cases. In Copenhagen, physical activity ($X^2 = 126.457$, $p = 0.001$ ***), and nature experiences ($X^2 = 77.905$, $p = 0.001$ ***), were the most common values assigned to cemeteries (both around 85%). Interestingly the spider map (Fig. 9) looked quite different in Helsinki. Here spirituality and tranquillity were the most common values, and social interactions (65%) significantly higher than in Copenhagen (46%) ($X^2 = 11.998$, $p = 0.001$ ***).

3.4. Who are the users?

The survey participants represent a somewhat skewed sample when it comes to gender, with a preponderance of women responding to the survey (Table 4). Most of the respondents were in the 30–64 age group

Table 3
Descriptive statistics of number of respondents, visiting points, density of visiting points and potential supply/demand per cemetery.

City	Study site	Respondents with visiting points within cemetery	Number of visiting points within the cemetery	Area size	Density of visiting points	Potential supply (% green and blue spaces)		Potential demand (population number)	
		Respondents	Visiting points	Ha	Visiting points/ ha	0–300 m	301–600 m	0–300 m	301–600 m
Copenhagen									
	Assistens	860	899	20.4	44.1	10.9	8.3	21662	24727
	Bispebjerg	182	188	42.7	4.4	29.7	21.5	11592	12108
	Sundby	67	77	10.5	7.3	2.2	5.5	13825	17740
	Vor Frelsers	17	17	1.6	10.6	3.0	19.7	13202	11125
	Brønshøj	12	12	3.0	4.0	2.1	19.1	3736	6958
	Mosaisk	8	8	1.3	6.2	11.5	31.5	9944	9868
Helsinki									
	Hietaniemi	39	50	31.3	1.6	51.2	43.2	9392	17399
	Vanha kirkkopuisto	19	22	2.0	11.0	2.7	6.9	4455	10549
	Malmi	8	10	50.2	0.2	26.4	42.3	5815	6469

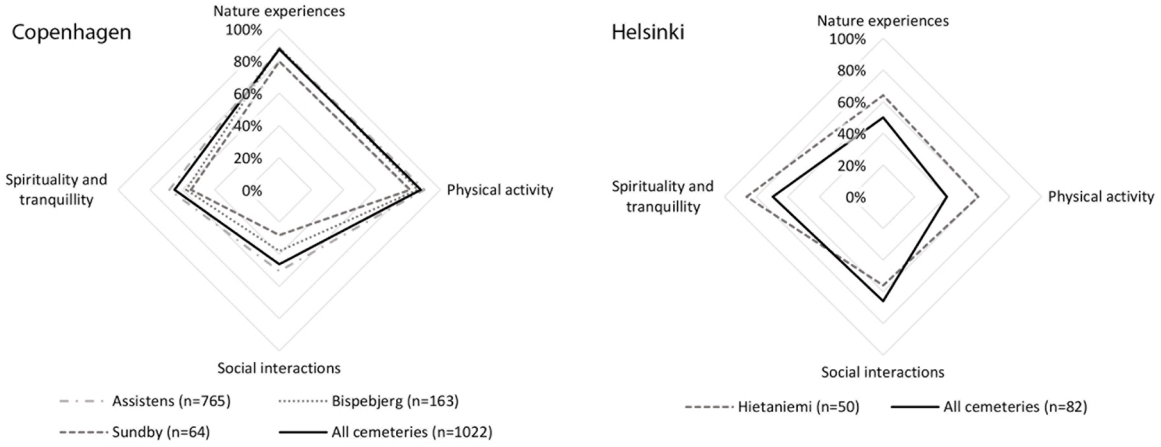

Fig. 9. Spider maps (radar charts) of the share of place values (experience qualities) across all cemeteries in the two study sites. Individual cemeteries with a minimum of 50 values are also plotted.

Table 4
An overview of the cemetery users.

	Helsinki Total sample (n = 1476)	Total cemeteries (n = 66)	Copenhagen Total sample (n = 4992)	Total cemeteries (n = 1146)
Gender (%)				
Male	42.4	36.9	31.9	31.4
Female	57.6	63.1	68.1	68.6
Age group (%)				
Young (15–29)	22.4	23.4	14.5	14
Middle-aged (30–64)	74.7	75.0	77.6	77.8
Older adults and elderly (65 +)	2.9	1.6	8.0	8.2
Children in household (%)				
Yes	30.2	28.6	30.1	30.7
No	69.8	71.4	69.9	69.3

(almost 78% in Copenhagen and 75% in Helsinki). About 30% of the respondents in both case cities had children in the household.

When we assessed the variation in usage within each of the demographic variables, we found in the Copenhagen sample that younger people were more inclined to use cemeteries for social interactions ($X^2 = 25.99$, $p = 0.001$ ***) and physical activity ($X^2 = 9.94$, $p = 0.001$ ***), but also spirituality and tranquillity ($X^2 = 9.99$, $p = 0.007$ **). In addition, households with children were more inclined to use cemeteries for social interactions ($X^2 = 57.93$, $p = 0.001$ ***) and for spirituality and tranquillity ($X^2 = 5.64$, $p = 0.021$ *). Due to small sample size, we did not assess variation in usage in the Helsinki sample.

4. Discussion

This comparative study on residents' use of urban cemeteries in Copenhagen and Helsinki nuanced the image of Nordic urban cemeteries as recreational landscapes. The interest in using cemeteries as recreational landscapes that we have seen in other Nordic studies (Grabalov, 2018; Evensen et al., 2017) and as promoted in policy documents from some Nordic capitals (Copenhagen Municipality, 2015; Oslo Municipality, 2017) was confirmed for Copenhagen but not for Helsinki. In Copenhagen, cemeteries are frequently used for recreational purposes, particularly the two cemeteries, Assistens and Bispebjerg. Furthermore, cemeteries were mapped particularly as places for physical activity and experiencing nature. The results from Helsinki tell another story. First of all, few of the Finnish respondents in this PPGIS study marked visiting points within cemeteries as places that they visit for leisure-time and recreational use. Of those who reported visiting cemeteries for recreational purposes, finding spirituality and tranquillity and social interaction were the main reasons, however, numbers from Helsinki are very low and results have to be interpreted carefully.

We have conducted a supply and demand analysis wherein part of the explanation is found. In Helsinki, the proportion of other green spaces in proximity to cemeteries is higher than in Copenhagen. This

means that there are alternative green spaces that could be used for recreational purposes. Furthermore, the number of people living nearby cemeteries is lower than in Copenhagen; therefore, there is less demand for using cemeteries in Helsinki than in Copenhagen. Our findings from Copenhagen may be a result of the densification process that have taken place in Copenhagen (Chen et al., 2020) the last decade and therewith forcing people to find alternative green spaces for recreation. In other studies (Evensen et al., 2017; Grabalov and Nordh, 2020; Quinton and Duinker, 2019), the use of cemeteries as recreational spaces is particularly emphasised in urban areas where the pressure on green space is striking. Our potential demand analysis is based on residents in the area around the cemeteries. The actual demand may be even higher in those cemeteries located in the city centre (such as Vanha kirkkopuisto in Helsinki and Assistens in Copenhagen), where many people work, run errands and socialise. Another aspect that could affect the demand is the quality of available green spaces in the neighbourhood and if there are other spaces that supply the same qualities as found in cemeteries. However, such an analysis is outside the scope of this paper. Even if the supply and demand analysis showed interesting results, cemetery use is not a simple correlation to population distribution, but in reality is determined by many perceivable accessibility factors (Wang et al., 2015). For example, railways and highways might act as structural accessibility barriers to use, and hence as evident from the location of the principal Helsinki sites where factors such as main transport corridors might have contributed to low visitation of some of the cemeteries (see location of Malmi cemetery in Fig. 5).

One could question if there are variations in the design of the cemeteries that could further explain the differences across Copenhagen and Helsinki. However, an overall analysis of spatial layout and facilities did not pinpoint any such differences. As can be seen in the photos of some of the cemeteries in the cities, both cities have cemeteries that are park-like (green) environments with trees, lawns, bushes, hedges, etc. They are walled (except for Vanha kirkkopuisto) and open during the daytime to visitors. However, we did not conduct any systematic mapping of the design of the cemeteries or the available facilities, such as benches, lighting or paths, which are likely to affect how they are used. Nor did we explore or compare the proportion or size of available recreational space (non-grave space) within the cemeteries. In a Danish study from 2012, it was emphasised that 'only one quarter of the cemetery ground is used for graves in both rural and urban cemeteries' (Kjøller, 2012, p. 342). In Copenhagen, there has been a surplus of grave space due to people returning grave rights, making it possible to re-use the grave after a certain number of years (Grabalov and Nordh, 2020). Since most graves are located in lawns, returned grave spaces signal open/unused lawns, which are spaces with the potential for recreation.

Another parameter which partly seems to impact use is the size of the cemetery. The most used cemeteries in Copenhagen (Assistens and Bispeberg) are also the largest of the Danish cemeteries included in this study (20 ha and 43 ha, respectively); however, the largest cemetery in the study is Malmi in Helsinki (50 ha), which, interestingly, is the least used cemetery. Size may also explain why Vanha kirkkopuisto, the smallest of the Helsinki cemeteries, is not used as a place for physical activities. In observations, we have seen that people walk through this area (as a shortcut); however, this was not one of the value categories mapped in the Helsinki study and, thus, cannot be statistically confirmed.

In Copenhagen, the cemeteries that are managed by the municipality are promoted as recreational spaces. The municipality invites people to come to cemeteries for a walk, a bike tour or for socialising. However, in Helsinki, there are, to the best of our knowledge, no such strategies, except in the case of Vanha kirkkopuisto (City of Helsinki, 2021) which is a non-active cemetery designated as a park. Hence, how the cemeteries are advertised or how information about them is communicated to the general public varies across the two investigated capitals. We also find variation within Copenhagen in this regard. The cemeteries that are managed by private church organisations (Vor Frelsers and Mosaisk) are not advertised as recreational spaces in the same way as those managed by the municipality. Most likely private church organisations do not have the same interest as the municipality in promoting cemeteries as recreational spaces because it would entail higher maintenance costs. The urban municipality on the other hand view cemeteries as public spaces (Grabalov and Nordh, 2021). For future studies, it would be relevant to explore whether cemeteries managed by municipalities in other Nordic cases exhibit greater acceptance of being used for recreational purposes or are actively promoted for such purposes.

In this discussion, we have focused on spatial and policy differences. Individual differences might also play a role, as might local or national traditions grounded in history and religion, which are outside the scope of this paper. In Helsinki, we noted a clear difference between active (Hietaniemi, Malmi) and non-active (Vanha kirkkopuisto) cemeteries. However, in Copenhagen none of the cemeteries are completely non-active, even if they have non-active cemetery sections. This makes it difficult to make any comparison with regards to attitudes towards what is suitable behaviour in an active cemetery.

The study offered the possibility to explore the identity of users of cemeteries and the purposes for which they use them. The analysis yielded various interesting insights. For example, in Copenhagen, younger people and households with children were more inclined to use cemeteries for social interactions. To the best of our knowledge, this is the first study to explore such links. That households with children use cemeteries for social interaction may have to do with a need for using a green space close to home. When we have visited cemeteries in Copenhagen we have observed mothers with trollies walking around at cemeteries. We have seen nurseries visiting cemeteries and children running around on the lawns. At some cemeteries, particularly Assistens cemetery, we have also observed young people walking around with friends or even bringing something to eat and relaxing on the lawn in between historic graves. For future studies it would be interesting to interview people using cemeteries for recreational purposes to understand reasons for it and further explore potential differences between groups. The data in Copenhagen was collected during the Covid-19 pandemic which could have impacted the results in the way that people may be more inclined to use outdoor spaces, including cemeteries. There are other studies confirming an increased use of urban outdoor green spaces in the Nordic region during the pandemic (Korpilo et al., 2021; Venter, Barton, Gundersen, Figari, and Nowell, 2020).

We end the discussion with some methodological considerations and thoughts about future studies. To begin with, the study is limited to PPGIS data in which people had to choose the kinds of activities they engage in at a cemetery (or any other green space) from among predefined categories. This means that people themselves could not type the kind of activities they do at cemeteries. Furthermore, for comparative purposes, the values people could choose from were, in the analysis, grouped into four overarching themes (*Places for social interactions*, *Places for nature experiences*, *Places for physical activity*; and *Places for spirituality and tranquillity*). The grouping of data resulted in a reduction in detailed information, particularly in the Danish study, such as the type of physical activity or nature experiences (Appendix 1). There were also additional categories, such as 'Cultural history' and 'A passage', which did not fit into the overall categories and were excluded from the comparison. Further analysis of the Danish data would be interesting in another paper and might contribute valuable knowledge to inform policy and practice.

A strength, as well as limitation, is that the data were generated from two independent PPGIS studies with, in total, more than 6400 respondents. The focus was on outdoor spaces in general. Hence, respondents did not rate the cemeteries per se. Instead, the focus was on their actual use of cemeteries as one of many types of outdoor spaces in their everyday lives. If they had been asked questions about particular experiences regarding cemeteries, the results might have been different. The recruitment process differed between the two cases. In Copenhagen, emails were sent to members of existing panels residing in five local

districts, while in Helsinki we recruited participants via letter to residents living in the study area. The recruitment process may have impacted the type of participants that chose to respond to our survey. However, using internet and existing online platforms as a way to recruit participants is nowadays common (Litman et al., 2017).

We would like to stress that the intention of this paper is not to increase the number of recreational activities at cemeteries, bearing in mind that active use of cemeteries, such as jogging and biking, can cause tensions between users (Rae, 2021). Instead, we aim to explore and describe how cemeteries are used today and to show that variation exists in usage across the Nordic countries. Such knowledge is important for policy and practice and can inform local discussions on which values and functions cemeteries should facilitate in the future and, furthermore, their role as public spaces in the urban context. Previous research on cemeteries has focused on qualitative studies of visitors' experiences (Nordh et al., 2018; Swensen et al., 2015) and what may or may not be appropriate behaviour at cemeteries (Nordh et al., 2017; Deering, 2010) For the future, we welcome studies that combine a quantitative approach with questions on use and experiences (i.e., by surveying urban residents on how they use urban cemeteries). Finally, the Covid-19 pandemic might have had an influence on our findings, as the Danish data collection was conducted during the pandemic, when people, in general, were more inclined to use outdoor spaces for social interactions and physical activity. However, Copenhagen Municipality had a strategy in place to increase the recreational use of cemeteries long before the pandemic struck (Nordh and Evensen, 2017; Grabalov and Nordh, 2020). The Helsinki data were collected prior to the pandemic. It would, of course, have been interesting to compare whether the usage changed during the pandemic; unfortunately, this is not possible with the current dataset.

5. Conclusions

The primary conclusion that we draw from this comparative PPGIS study of Copenhagen and Helsinki is that the way Nordic cemeteries are used varies between countries and cities. When we explored and compared how residents in Copenhagen and Helsinki used their everyday outdoor environments and which spaces were important to them, we found that Danes marked cemeteries as spaces for recreation much more frequently than Finns did. In Copenhagen, nature experiences and physical activity were most common values assigned to cemeteries, while in Helsinki, cemeteries were mainly used for social interactions, and spirituality and tranquillity, however, the Helsinki data is based on very low number of participants, hence the results should be interpreted carefully. A couple of cemeteries in Copenhagen, Assistens and Bispebjerg, stood out from the rest as places with many visiting points. Several factors might explain why these cemeteries were used more than others: the *size* of the cemetery (larger cemeteries were in most occasions used more), its *location* and *proximity to other green spaces* (when there were a lack of other green spaces, the pressure on cemeteries seemed to be higher), the *number of people* residing around the cemetery (densely populated areas were equated with higher pressure on cemeteries) and, how the cemetery is *advertised* and *managed*.

CRediT authorship contribution statement

Helena Nordh: Conceptualization, Methodology, Writing – original draft. **Anton Stahl Olafsson**: Formal analysis, Investigation, Methodology, Writing - review & editing, Visualization. **Anna Kajosaari:** Formal analysis, Investigation, Methodology, Writing – review & editing, Visualization. **Søren Præstholm:** Formal analysis, Investigation, Writing – review & editing, Visualization. **Yu Liu:** Formal analysis, Investigation, Writing – review & editing. **Saana Rossi:** Writing – review & editing. **Sandra Gentin:** Investigation, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The five local districts Brønshøj-Husum; Bispebjerg; Nørrebro; Amager Øst; and Amager Vest in the Municipality of Copenhagen are kindly acknowledged for distributing the survey to the district citizen panels. The study was partly funded by Academy of Finland [PlanHealth, project number 13297753] and Nordforsk [NORDGREEN - Smart Planning for Healthy and Green Nordic Cities, project number 95322].

Appendix 1. An overview of the original values and recorded main categories in Copenhagen

Original value (Copenhagen)	Recoded category
Biodiversity	Places for nature experiences
Close to nature	Places for nature experiences
Walk/Stroll	Places for physical activity
Being Outdoors	*Not included; does not fit into the four overall comparative categories.*
Aesthetic View	Places for nature experiences
Nature Sounds/Silence	Places for nature experiences
Observe Nature	Places for nature experiences
Relax Recharge	Places for spirituality and tranquillity
Nice Smells	Places for nature experiences
Being with Family Friends	Places for social interactions
Exercise/Sport	Places for physical activity
Cultural Heritage	*Not included; does not fit into the four overall comparative categories.*
Feelings/Inspiration/Surprise	Places for spirituality and tranquillity
Spiritual	Places for spirituality and tranquillity
Picnic	Places for social interactions
Play with Children	Places for social interactions
Dog Walking	Places for physical activity
Shortcut	*Not included; does not fit into the four overall comparative categories.*
Closeness to Water	Places for nature experiences

Appendix 2. An overview of the original values and recorded main categories in Helsinki

Original value (Helsinki)	Recoded category
Places where I enjoy nature or being outdoors	Places for nature experiences
Places for leisure-time physical activity	Places for physical activity
Places that help me escape stress	Places for spirituality and tranquillity
Places that help me relax	Places for spirituality and tranquillity
Places where I enjoy urban life	Places for social interactions
Places where I spend time with family or friends	Places for social interactions
Places where I can run into good people	Places for social interactions

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