The Power of Place:
A Study of the Seven Districts of Amsterdam

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Abstract

Introduction: In the light of the COVID-19 pandemic and the subsequent challenges for social cohesion, researchers and policymakers have stressed the importance of social infrastructure in the neighbourhood. The city of Amsterdam was used as a case study to examine whether residents' satisfaction with social infrastructure is associated with neighbourhood social cohesion. Additionally, this study tested whether the strength of this relationship varied between privileged and deprived districts in Amsterdam.

Theory: The two-by-two framework and five dimensions of social cohesion were used to conceptualise neighbourhood social cohesion. Place attachment theory and social disorganisation theory were discussed to shed light on possible mechanisms between the satisfaction with social infrastructure and neighbourhood social cohesion.

Data and methods: Data was extracted from the Basisbestand Gebieden Amsterdam (BBGA) (N = 18). Factor analysis distinguished two key dimensions of social spaces – socio-economic and recreational spaces – which were treated as separate independent variables to measure neighbourhood social cohesion (N = 884). District SES was added as a moderation variable.

Results and conclusions: Findings suggest that social infrastructure plays a significant role in promoting social cohesion, and that the type of social infrastructure that is most effective may vary depending on the socio-economic context of a district. These findings carry important implications for future research and policymakers as they could be used to design more inclusive and accessible social infrastructure to promote neighbourhood social cohesion. This study recommends policymakers to enhance bonding and bridging capital of residents in Amsterdam, which can be achieved through the novel policy instrument 'participatory budgeting'.

Keywords: neighbourhood social cohesion, social infrastructure, place attachment, social disorganisation, factor analysis, linear regression analysis, bonding and bridging social capital, participatory budgeting

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Introduction

Social life revolves around the fundamental concept of 'co-presence', particularly because people exist as beings who are both physical and social in nature. Social scientists have defined co-presence as the shared physical location of individuals (Beaulieu, 2010; Marcus & Legeby, 2010). This definition acknowledges that co-presence is necessary, but it is not a sufficient condition for social interaction. From a sociological perspective, it is important to recognise that co-presence extends beyond mere physical proximity. It involves the formation of social bonds and the cultivation of a shared sense of cohesion among individuals who inhabit the same physical space (Giddens, 1984; Goffman & Manning, 2010). This perspective has addressed a relevant distinction from the physical infrastructure (e.g., streets, buildings, and sewage) by revealing underlying social infrastructure that facilitates social interaction and sustains social cohesion (Horgan et al., 2022). Building upon these valuable insights, this study aims to investigate the impact of social infrastructure on social cohesion in the Netherlands, and more specifically Amsterdam, as this relationship is complex and has remained understudied in this context (van Bergeijk et al., 2008; van de Kamp & Welschen, 2019).

Public spaces exemplify the social infrastructure (Latham & Layton, 2019). Parks, libraries, sports facilities, community centres, and playgrounds are obvious examples of spaces. Seemingly mundane and incidental spaces, such as bus stops, grocery stores, and doctor's offices, also serve as essential elements of social infrastructure (Jones et al., 2015; Latham & Layton, 2019; Mikhailovna, 2020). Although some of these spaces may technically be privately owned or 'semi-private', they are available to the public to a certain extent and facilitate opportunities for social interaction among community members (Horgan et al., 2022). Existing research has shown the importance of public spaces for fostering social cohesion. These spaces provide a physical environment that enables individuals to establish and maintain social relationships (Latham & Layton, 2022). When public spaces provide appealing experiences and well-designed amenities, they enhance the overall quality of social interactions, thereby deepening relationships between community members (Wan et al.,

2021). In turn, public spaces can foster community involvement and civic engagement, as well as the development of a sense of belonging and community resilience (Wickes et al., 2019; Witten & Ivory, 2018). Moreover, sociologist Eric Klinenberg (2018) has emphasised the importance of social infrastructure in fostering vibrant urban communities, as it has addressed and prevented pressing social issues, such as social isolation, discrimination, and inequality. By providing spaces that bring individuals of different ages, races, genders, and income levels together, the social infrastructure can contribute to more cohesive, inclusive, and equitable communities (Horgan et al., 2022).

COVID-19 in the Netherlands

From a societal perspective, the COVID-19 pandemic has afforded a unique opportunity to examine the relationship between social infrastructure and social cohesion. Firstly, the pandemic forced many Dutch people to work from home and interact with others virtually (Bosmans et al., 2022). This has increased the use of digital technologies in everyday social life, which has revolutionised how individuals socialise and relate to one another, particularly as these technologies have allowed people to have social contact regardless of physical location (Groeneweg, 2019; Vine, 2023). However, the immediate physical location remains crucially important for more meaningful social interaction, because research has shown that digital communication technologies are imperfect substitutes for physical co-presence (Koester, 2022; Simola et al., 2022).

Secondly, Dutch people were heavily restrained in their ability to engage in physical interactions due to restrictions that prohibited large gatherings (Bosmans et al., 2022). Consequently, access to certain public spaces, such as community centres, outdoor spaces (e.g., parks and playgrounds), and essential stores (e.g., supermarkets and pharmacies), became limited (The National Institute of Social Research [SCP], 2020). Further opportunities for social interaction were reduced, as sports facilities (e.g., gyms, sports clubs, and stadiums), hospitality venues (e.g., restaurants, bars, and clubs), and cultural spaces (e.g., libraries, museums, galleries, cinemas, and theatres) were temporary closed to the public (SCP, 2020). Although stricter restrictions were gradually lifted, local authorities and

entrepreneurs were obligated to modify the designs of public spaces to comply with safety guidelines. This lasted for more than two years, and as a result, the likelihood of meaningful interaction between Dutch individuals was heavily reduced for an extended period of time (Engbersen et al., 2020; Bosmans et al., 2022).

On one hand, the pandemic may have strengthened the sense of cohesion among Dutch individuals. The SCP (2020) has argued that adherence to COVID-rules has demonstrated a powerful expression of collective solidarity, which could imply a strong sense of cohesion. On the other hand, the SCP has warned that the pandemic may pose long-term implications for social cohesion, as it forced numerous organisations to make significant budget cuts, which may have negatively impacted the quality of public spaces. The study also raised the vital question of whether individuals who typically rely on these spaces for social support have re-engaged with and reintegrated into social groups and organisations following the prolonged period of limited access or complete absence of these spaces (Engbersen et al., 2020; SCP, 2020). Hence, the SCP (2020) has argued that the impact of the pandemic on social cohesion remains inconclusive. This highlights the need for further research to assess the current strength of social cohesion in the Netherlands.

In areas that lack social cohesion, unwanted behaviours can emerge, such as nuisance, pollution, and criminality (van Bergeijk et al., 2008). As a result, people can experience increased feelings of unsafety and may choose to refrain from social interaction altogether, leading to social isolation and social fragmentation (Durkheim, 2014). As people become increasingly dissatisfied, the chance of residential turnover grows (Kearns & Parkes, 2003). In turn, cohesively-weak areas spiral in their decline, further exacerbating the erosion of social cohesion (van Bergeijk et al., 2008). However, social infrastructure could mitigate potential negative consequences on social cohesion (van Bergeijk et al., 2008; Horgan et al., 2022; van de Kamp & Welschen, 2019). Therefore, this study aims to shed light on social cohesion by examining the potential impact when certain areas face a lack of access to public spaces, as temporarily highlighted during the COVID-19 pandemic (Bosmans et al., 2022).

Amsterdam: A Neighbourhood Perspective on Social Cohesion

Scientists have regarded social cohesion as a phenomenon that operates on multiple levels within society, including the country, city, and neighbourhood. Social cohesion will be examined on the neighbourhood level for three reasons. First, the neighbourhood serves as an important setting where various social processes unfold, which ultimately shape the social identity of a community (Forrest & Kearns, 2001). Second, travel restrictions during the pandemic have highlighted the importance of the neighbourhood as a key support network, as people were severely restrained in their mobility (de Haas et al., 2020). Third, research suggests that the most empirically effective studies on social cohesion are those that have examined it on lower levels in society, as these provided insights into the 'lived experiences' of residents in everyday social infrastructure (Aelbrecht et al., 2023).

Amsterdam is a compelling case due to its structurally lower scores on social cohesion compared to the national average. Figure 1 illustrates that half of Amsterdam's residents have perceived "weak" social cohesion in their neighbourhoods. Although residents perceived knowing each other well and having pleasant interactions, challenges were prevalent, such as lacking a sense of belonging, a limited sense of community, and sporadic contact with neighbours.

Figure 1

Residents' Perceived Differences in Social Cohesion (Total and Six Dimensions) Between the Netherlands and Amsterdam (2016, 2017, and 2019)
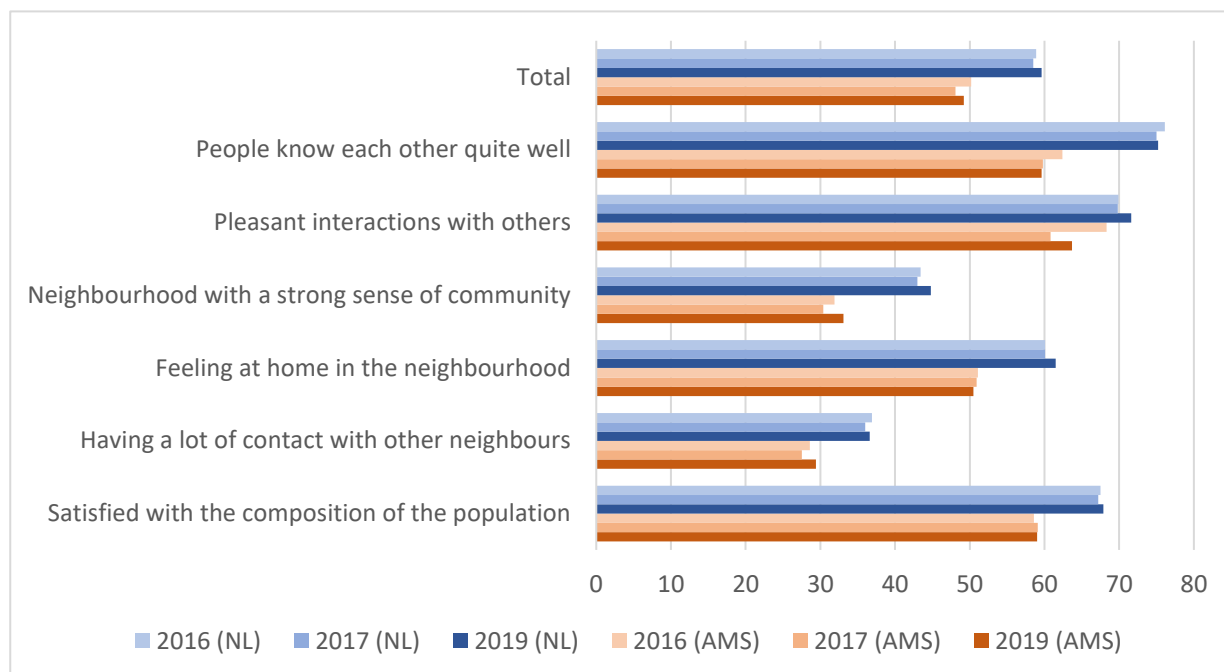
Note. Numbers represent percentages (x-axis). 2018 was excluded, measurements of social cohesion occurred bi-yearly after 2017

However, the social infrastructure in Amsterdam has the potential to play a pivotal role in addressing these challenges and promoting social cohesion within neighbourhoods (van Bergeijk et al., 2008; Horgan et al., 2022; van de Kamp & Welschen, 2019). By understanding how residents have evaluated social infrastructure in their neighbourhoods throughout the years, this study aims to gain valuable insights into its potential effectiveness and identify specific areas for improvement. Therefore, the descriptive research question is as follows: *How have residents of Amsterdam evaluated the social infrastructure in their neighbourhoods throughout the years?*

Furthermore, these lower scores on social cohesion highlight the need to explore how social infrastructure can effectively address the challenges faced by residents. By doing so, valuable insights can be gained into the mechanisms through which residents' satisfaction with the social infrastructure may contribute to neighbourhood social cohesion. Examining a

possible moderation effect of socio-economic status (SES) at the district level will help in understanding how different contexts could potentially shape the relationship between residents' satisfaction with social infrastructure and neighbourhood social cohesion (Municipality of Amsterdam, 2022). Therefore, the following explorative research question is formulated: *To what extent is residents' satisfaction with social infrastructure associated with neighbourhood social cohesion in Amsterdam? And to what extent does the socio-economic status of the district moderate this relationship?*

Vulnerable individuals make up a large portion of the population in Amsterdam (Municipality of Amsterdam, 2022). These groups often consist of individuals who have relatively poorer health, who are unemployed, have a low educational level, and have a low income (Municipality of Amsterdam, 2022; Bosmans et al., 2022). These vulnerable groups are facing challenges in accessing public spaces due to constrained mobility or limited financial resources to travel to spaces that are located in more affluent areas (Bosmans et al., 2022; SCP, 2020). As a result, vulnerable groups have less access to social support and assistance from their surroundings, which can make it more difficult for them to build social relationships and participate meaningfully in society (Municipality of Amsterdam, 2022; Bosmans et al., 2022). However, studies in different contexts has suggested that enhancing the accessibility and inclusivity of social infrastructure can facilitate meaningful participation among vulnerable groups (van Bergeijk et al., 2008; Horgan et al., 2022; Klinenberg, 2018). Therefore, the policy question that this study aims to answer is: *What measures can be implemented to enhance the accessibility of social infrastructure in Amsterdam, specifically targeting the promotion of meaningful participation among the most vulnerable residents?*

Theoretical Framework

In academic and policy circles, the term "social cohesion" has gained popularity in recent years (Schieffer & van der Noll, 2017). However, it lacks a precise and comprehensive definition, which has often led to ambiguity surrounding its conceptualisation and operationalisation (Bollen & Hoyle, 1990; Jenson, 2010). This study will conceptualise social cohesion using the frameworks of Chan et al. (2006) and Forrest and Kearns (2001), because they provide a useful starting point for understanding the concept and have been used in a variety of studies (Bailey et al., 2012; van der Meer & Tolsma, 2014; Schieffer & van der Noll, 2017). Moreover, these frameworks could provide insight into potential mechanisms that could constitute the relationship between satisfaction with social infrastructure and neighbourhood social cohesion. Given the limited research on the quantitative relationship between social infrastructure and social cohesion (van Bergeijk et al., 2008), this study aims to fill gaps in knowledge by addressing this potential association. In the following sections, this study will provide justifications for the selections of these frameworks.

Two-by-Two Framework of Social Cohesion

In an extensive literature review, Chan et al. (2006) have proposed a more rigorous and unambiguous definition of social cohesion. The authors have explained that social cohesion should be understood as "a state of affairs concerning how well people in a society 'cohere' or 'stick' to each other" (p. 289). They have argued that the degree to which people stick together (i.e. cohesiveness) reflects individuals' state of mind, which can ultimately cultivate shared attitudes and behaviours. Hence, Chan et al. have defined social cohesion as a range of attitudes and norms that represent trust, a sense of belonging, active participation, along with the observable behaviours that reflect these attitudes and norms. Additionally, the authors have proposed a two-by-two framework to conceptualise social cohesion (Appendix II).

This framework has distinguished (objective) behaviours from (subjective) attitudes. These have been further divided into dimensions, representing relationships among individuals within society (horizontal) and state-citizen relationships (vertical). Recent

studies on neighbourhood social cohesion have suggested that it can best be analysed through the perceptions and experiences of social interactions between local residents (Aelbrecht et al., 2023; Erdem et al., 2015; Tolsma et al., 2009). Therefore, this study will analyse neighbourhood social cohesion on the subjective horizontal level (i.e. between residents of a neighbourhood and based on their attitudes towards each other).

Fived Dimensions of Social Cohesion

Forrest and Kearns (2001) have characterised social cohesion as a bottom-up process, meaning that it is created by the interactions of individuals and communities, rather than a top-down process, that is imposed by a government. Moreover, they have argued that social cohesion at the societal level may be derived from social interactions between individuals on the local level (Kearns & Forrest, 2000). This shows that studying social cohesion on the neighbourhood level is important, because it could shed light on how social cohesion is created and maintained at a societal level. Additionally, Forrest and Kearns (2001) have proposed a framework in which five dimensions of social cohesion have been distinguished. For this study, two of these dimensions – 'place attachment and identity' and 'social order and social control' - will be discussed in detail to examine the possible relationship between residents' satisfaction with social infrastructure and neighbourhood social cohesion (Appendix III).

The place attachment theory will be used to examine the 'place attachment and identity' dimension, and how place attachment may serve as a potential mechanism between satisfaction with social infrastructure and social cohesion. Among scholars, place attachment is a well-established theory in the social sciences, including sociology, psychology, and geography (Windsong, 2010). The theory has been used to examine the relationship between individuals and places, and how it can affect social cohesion (Bailey et al., 2012; Forrest & Kearns, 2001). There have been several definitions of "place" across these disciplines, but the largest discrepancy lies between the geographical and sociological sciences. Geographers view place as a bounded entity with a fixed identity, while sociologists consider it a meeting place for interactive potential and shaping community identity (Kearns & Forrest, 2000; Lewicka,

2011). For this study, the sociological definition will be used, as it aligns with Forrest and Kearns' (2001) finding that the neighbourhood has remained an important source of a neighbourhood's social identity, especially in contemporary times. Nowadays, the neighbourhood has become increasingly important as an arena for leisure and recreation, which has made it "an extension of the home for social purposes" and a key source of shared community identity (p. 2130). For these reasons, place attachment theory is relevant to discuss with regard to social infrastructure and neighbourhood social cohesion.

Additionally, the 'social order and social control' dimension will be discussed in light of the social disorganisation theory. The social disorganisation theory suggests that neighbourhoods with high levels of disorder are more likely to experience unwanted behaviours, such as pollution, crime, and violence, which can reduce social cohesion (van Bergeijk et al., 2008). Therefore, this theory could shed light on why certain neighbourhoods in Amsterdam could experience different levels of satisfaction with social infrastructure in relation to social cohesion. Understanding the underlying mechanisms that constitute these relationships can help to formulate relevant hypotheses.

Place Attachment Theory

Several studies have shown that social infrastructure of a neighbourhood can create a sense of "place attachment" among residents of a community (van Bergeijk et al. 2008; Clarke et al., 2023; Forrest & Kearns, 2001). Place attachment can foster and cultivate a sense of belonging and community cohesion among residents (Bailey et al., 2012). There are a number of reasons why social infrastructure might contribute to place attachment, and why this can ultimately enhance social cohesion within a neighbourhood.

Firstly, social infrastructure can foster 'place identity'. This refers to an individual's emotional connection to a particular place in the neighbourhood (Hammitt, 2006; Shumaker & Taylor, 1983). When individuals have positive experiences and memories after visiting certain public spaces, they may develop strong identification and attachment to those places (Forrest & Kearns, 2001). Subsequently, when people feel strongly attached to and identify with a place, it can make them feel at home in their neighbourhood, which can strengthen
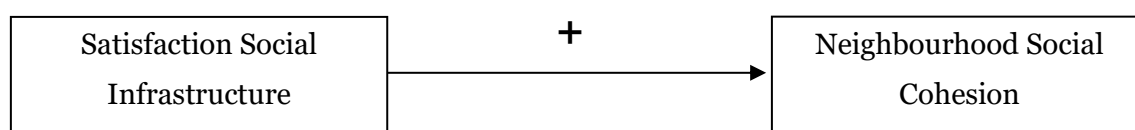
their sense of belonging and lowers the threshold to make contact with others. These activities contribute to improved social ties and social support, as community gardens provide a space for people to gather, socialise, and connect with neighbours, which can ultimately benefit social cohesion (Veen et al., 2016). For instance, residents who strongly identified with community gardens can build friendships over shared interest in gardening, share their produce, spend more time gardening with their families, and meet their neighbours (Hale et al., 2011; Mangadu et al., 2017; Noone & Jenkins, 2017).

Secondly, social infrastructure can cultivate a 'public belongingness'. This refers to the sense of being a part of something larger than oneself (Forrest & Kearns, 2001; Mesch & Manor, 1998). When people feel that they belong in their neighbourhood, they are more likely to invest in its social infrastructure (Forrest & Kearns, 2001). This investment can take many forms, including spending time in public spaces, participating in shared activities with neighbours, and maintaining the space itself. Residents who invest in social infrastructure are more likely to feel a sense of attachment, responsibility, and 'ownership' for their neighbourhood. Ownership refers to the degree to which residents feel that their neighbourhood belongs to them or have 'membership' to the environment (Kuo et al., 2021; Mesch & Manor, 1998). For instance, Teig et al. (2009) has found that community gardens can cultivate a sense of ownership among residents. By operating and maintaining the garden, residents felt as if they were contributing to something larger than themselves and that they had a say in how the space is used. The study also found that residents had improved their social capital, as they participated in shared activities and decision-making, such as planting, harvesting, and maintaining the garden. Social capital is a valuable resource that can help people access support, opportunities, and information, which has shown to positively contribute to social cohesion (Feinberg et al., 2023; Kearns & Forrest, 2000; Teig et al., 2009). Overall, when people feel like they have a stake in their neighbourhood, they are more likely to take action to improve it and build relationships with their neighbours, which can lead to a more cohesive neighbourhood (Forrest & Kearns, 2001).

Few studies have highlighted the potential negative effects of strong place attachment. For instance, Lewicka (2011) has shown that strong place attachment might cause people to miss out on new experiences and opportunities outside their local environment. However, the majority of studies have shown that stronger place attachment is not typically regarded as something negative and that it has positive effects on the sense of belonging and community cohesion (Bailey et al., 2012; Forrest & Kearns, 2001; Peters, 2010). Therefore, the first hypothesis is formulated: *Residents who are more satisfied with the social spaces in their local environment experience a stronger sense of neighbourhood social cohesion than less satisfied residents in Amsterdam* (H1) (Figure 2).

Figure 2

Path-model for Hypothesis One

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┌─────────────────────┐         +          ┌─────────────────────┐
│  Satisfaction Social│ ─────────────────► │ Neighbourhood Social│
│    Infrastructure   │                    │       Cohesion      │
└─────────────────────┘                    └─────────────────────┘
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Social Disorganisation Theory

The social disorganisation theory suggests that neighbourhood characteristics, such as poverty, crime, pollution, and residential instability, can contribute to a breakdown in social bonds and community cohesion (Markowitz et al., 2001; Shaw & McKay, 1942). According to the Netherlands Scientific Council for Government Policy (WRR) (Visser et al., 2022), visible signs of neglect in a neighbourhood, such as graffiti and litter in public spaces, may contribute to social disorder and crime. When disorderly aspects remain unaddressed by local authorities and municipalities, it might signal to residents that there is a lack of social control in a neighbourhood (Clarke et al., 2023; Forrest & Kearns, 2001; Holtan et al., 2015). Consequently, residents may be under the impression that minor infractions of the law are more likely to go unpunished and, over time, a climate of uncertainty and fear might develop (Durkheim, 2014; Kearns & Forrest, 2000). Social infrastructure can be less effective in

connecting people in deprived neighbourhoods, as green spaces in these neighbourhoods may be seen as uninviting or dangerous, which can discourage people from using them. As a result, the green space would not serve as an arena that provides opportunities for informal interactions, which could negatively impact the degree of cohesion between residents (Holtan et al., 2015).

However, social infrastructure also has the potential to mitigate these negative effects by building 'public familiarity'. Public familiarity can be understood as the degree of recognition, acquaintance, and comfort that residents have with each other in their neighbourhood, even if they do not have strong relationships with one another (Blokland, 2009; Horgan et al., 2022). Short and sporadic interactions give residents sufficient information to recognise and categorise one another (van Bergeijk et al., 2008). Research has found that green spaces can be useful places to build public familiarity among residents. Green spaces allow residents to interact with each other in a casual and relaxed setting (Blokland, 2009). Studies have shown that residents who live near green spaces are more likely to use those spaces (Peters, 2010), and that these spaces tend to be more diverse than other public spaces (Coley et al., 1997). This means that residents are more likely to meet people from different backgrounds in green spaces, which can help to break down barriers and build familiarity (Peters et al., 2010). Additionally, when residents are familiar with each other's presence through the use of public spaces, it can strengthen interpersonal trust between them and enhance their sense of safety in the neighbourhood (van Bergeijk et al., 2008; Holtan et al., 2015). Overall, public familiarity can make people feel more recognised and willing to engage with one another, which can contribute positively to neighbourhood social cohesion (Blokland, 2009; Horgan et al., 2022).

Furthermore, Engbersen et al. (2017) have argued that public spaces are essential for other forms of capital to flourish. The relationships that are built in public spaces can be leveraged to access other resources, such as social support and employment opportunities. However, residents of deprived neighbourhoods may face greater barriers in accessing and using social infrastructure due to challenges, including limited access to resources, higher

crime rates, and weaker social support networks (Bailey et al., 2012; van Bergeijk et al., 2008). These factors can hinder the development of strong social ties and cohesion within the community.

On one hand, social disorganisation theory suggests that the relationship between satisfaction with social infrastructure and social cohesion may be weaker in deprived neighbourhoods, as they face other social issues that can weaken the connective power of public spaces. One the other hand, the theory suggests that public spaces can foster public familiarity, which may mitigate these negative consequences. Therefore, the following hypothesis recognises that the impact of satisfaction with social infrastructure on neighbourhood social cohesion may vary depending on the socio-economic context of the area: *Residents of deprived districts in Amsterdam experience a weaker positive relationship between the satisfaction with social infrastructure in their local environment and neighbourhood social cohesion compared to residents of privileged districts* (H2) (Figure 3).

Figure 3

Path-model for the Predicted Moderation Effect
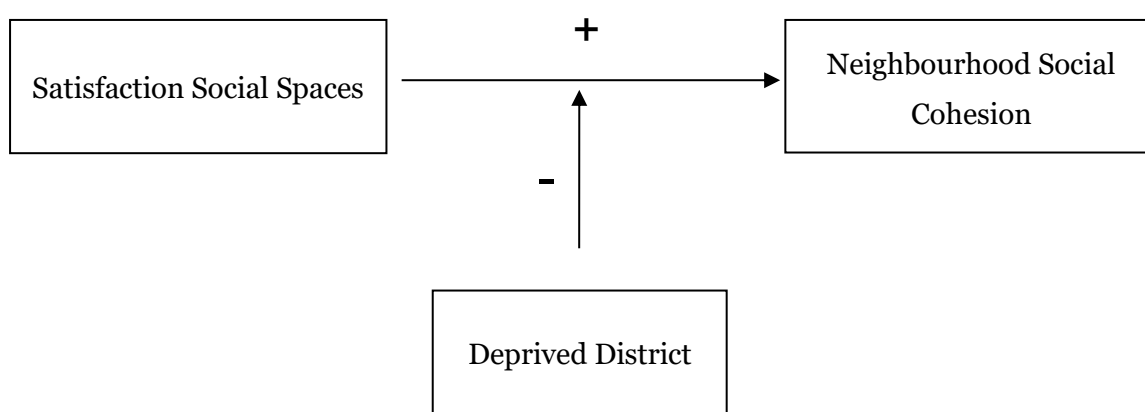
Data and Measurements

Cases and Research Methods

This study is a quantitative, cross-sectional analysis of the relationship between residents' satisfaction with social infrastructure and neighbourhood social cohesion, and the potential moderation effect of district SES. The study used the "Basisbestand Gebieden Amsterdam" (BBGA) dataset, which was published by the Municipality of Amsterdam in 2022. The BBGA is aggregated at the meso-level, making it a valuable source for researchers and policymakers who aim to investigate socio-economic disparities and social trends over time between different groups and areas of Amsterdam.

At the time of measurement (January 1st 2022), the base population of Amsterdam was 881,933 (Municipality of Amsterdam, n.d.). The BBGA-dataset consist of self-reported information from residents on various aspects of their neighbourhood, including their satisfaction with social infrastructure and attitudes towards other residents. In total, the BBGA consists of 18,275 cases and each case represents a district ("stadsdeel"), a neighbourhood ("wijk"), or a community ("buurt") in Amsterdam. Moreover, Amsterdam has 7 districts – "Centrum", "Noord", "Oost", "Zuid", "West", "Zuid-Oost", and "Nieuw-West" (Appendix IV) –, 110 neighbourhoods (see Appendix V), and 518 recognised communities (Appendix VI).

Regarding ethical considerations, the BBGA is publicly-available through the website and the Open Data portal of the Municipality of Amsterdam. In addition, the BBGA contains no individual-level and personally identifiable information due to the aggregated nature of the data. Therefore, the potential risk of privacy infringement is non-existent, which ensures the ethical integrity of this study.

Selection and Exclusion Criteria

Forecast Data

Prior to the analysis, one filter was applied to remove forecast data (i.e., predictions from 2023 until 2050) from the dataset. However, this did not change the total number of cases (N = 18275).

Removed Cases

Cases from "Weesp" were removed from the dataset (N = 137). The town of Weesp was officially annexed by Amsterdam in 2019. However, at the moment of writing, Weesp is not officially recognised as a district due to the recency of its annexation (Municipality of Amsterdam, n.d.).

In contrast to Weesp, Westpoort has been officially recognised as a district. However, the area is often characterised as the harbour or industrial zone of Amsterdam, which does not reflect the residential nature of the other districts (Municipality of Amsterdam, 2022). Therefore, cases from Westpoort were also removed from the dataset (N = 187).

Missing Cases

Furthermore, multiple cases did not contain location information, which is necessary to measure differences between specific areas in the city. Thus, missing cases were removed from the dataset as well (N = 2965). In total, 3,289 cases were removed, which results in a total number of 14,986 cases for the analysis.

Variables

Dependent Variable: Neighbourhood Social Cohesion

Neighbourhood social cohesion was measured using six items, derived from the operationalisations of the Municipality of Amsterdam (2022) and Statistics Netherlands (CBS, 2022). Each item was measured on a 10-point Likert-scale: 'contact with fellow residents', 'residents help each other', 'involvement neighbours', 'interaction between groups', 'feeling at home', and 'satisfaction with neighbourhood' (α = .94). A full list of questions for each item can be found in the Appendix (VII).

Independent Variable: Satisfaction with Social Infrastructure

Satisfaction with social infrastructure was measured using eleven items from the BBGA. Each item represents a particular type of public space and the following items were combined, because previous studies have suggested that they have the potential to improve neighbourhood social cohesion: 'cultural spaces' (e.g., Bína & IJdens, 2008), 'hospitality venues' (e.g., Simons et al., 2016), 'community centres' (e.g., Horgan et al., 2022), 'shopping

facilities' (e.g., Coen et al., 2008; Xi et al., 2021), 'healthcare facilities' (e.g., Alizadeh, 2022),

'public transport facilities' (e.g., Latham-Mintus & Miller, 2019), 'parking facilities' (e.g.,

Jaffar et al., 2020), 'school facilities' (e.g., Wilkinson et al., 2020), 'green spaces' (e.g., Clarke

et al., 2023; Jennings & Bamkole, 2019; Peters et al., 2010), 'playgrounds' (e.g., Maller et al.,

2019), and 'sports facilities' (e.g., Testa et al., 2023).

Each item was measured on a 10-point Likert-scale and represents residents' average

satisfaction with a particular public space. Residents of Amsterdam were asked: what is your

opinion on the availability of [type of space] in your neighbourhood?', with each possible

answers ranging from 'very inadequate' (1) to 'very adequate' (10). A more comprehensive list

of example spaces can be found in the Appendix (VIII).

Due to the high number of chosen items, a reliability analyses was performed to check

the internal consistency of the construct. The analysis has suggested that the deletion of one

item, 'parking facilities', would marginally increase the reliability of the construct (from α =

.79 to α = .81). An additional factor analysis was conducted to explore the potential impact of

deleting this item from the factorial structure. Factor analyses can give insight into possible

underlying patterns within the chosen set of items, which improves the construct's

measurement and overall validity (Werner et al., 2014). Two statistical measures were used

to evaluate the adequacy of the data. Firstly, the Kaiser-Meyer-Olkin Measure of Sampling

Adequacy (KMO) was used to assess the proportion of variance in the observed variables that

can be explained by underlying factors. Secondly, Bartlett's test of sphericity was used to

analyse the extent to which the observed variables are related to each other.

All eleven items were subjected to an exploratory factor analysis with oblique rotation

(Oblimin). The KMO, with a value of .77, has confirmed the sampling adequacy for the

analysis. Bartlett's Test of Sphericity has demonstrated that the correlation structure between

the items is adequate, showing a significant value of $\chi2$ (55) = 5797.010, p < .001. Therefore,

both results have suggested that the data is suitable for factor analysis. The results of the

second factor analysis are presented in Table 1.

Table 1

Factor Loadings and Eigenvalues of the 11 Items of the Satisfaction with Social

Infrastructure

Items	Factor Loading		Dimension
	1	2	
Cultural spaces	**.90**	-.24	Satisfaction with
Hospitality venues	**.89**	-.21	Socio-economic
Community centres	**.84**	.10	Spaces
Shopping facilities	**.80**	.05	
Healthcare facilities	**.73**	.37	
Public transport facilities	**.49**	-.07	
School spaces	**.53**	**.44**	
Green spaces	-.15	**.86**	Satisfaction with
Playgrounds	.15	**.84**	Recreational
Sports facilities	.11	**.79**	Spaces
Parking facilities	-.17	**.63**	
Eigenvalue	4.244	2.759	
% of Variance	38.584	25.079	
Cumulative %	38.584	63.664	

Note. N = . Extraction method: Principal Component Analysis; Rotation method: Oblimin

with Kaiser normalization. Loadings larger than .40 are in bold.

The Principal Component analysis with a cut-off point of .40 and the Kaiser's criterion eigenvalues greater than 1 (Field, 2012), has yielded a two-factor solution as the best fit for the data, cumulatively accounting for 63.7% of the variance. The first factor has an eigenvalue of 4.24, accounting for 38.6% of the variance. This factor comprises of six items: 'cultural spaces' (.90), 'hospitality venues' (.89), 'community centres' (.84), 'shopping facilities' (.80),

'healthcare facilities' (.73) and 'public transport facilities' (.49). The last item 'public transport facilities' has a relatively low factor loading. Therefore, a separate reliability analysis was conducted with these six items. The results have suggested that the overall reliability is relatively high (α = .86) and deleting this item is only slightly beneficial (α = .87). Moreover, research has shown that the availability of public transportation services in the neighbourhood increase the likelihood of participating in social activities and employment opportunities, which can improve one's socio-economic status (Latham-Mintus & Miller, 2019). On the basis of the adequate factor loading, high internal consistency, and theoretical justification, 'public transport facilities' will not be removed from the analysis.

The second factor has an eigenvalue of 2.76, accounting for 25.1% of the variance. This factor comprises of: 'green spaces' (.86), 'playgrounds' (.84), 'sports facilities' (.79) and 'parking facilities' (.63). Similar to the first factor, the last item 'parking 'facilities' has a relatively low factor loading. Hence, an additional reliability analysis was conducted. Results show a high internal consistency between these four items (α = .80), but deleting 'parking facilities' from the items would further improve the overall reliability (α = .85). In practice, parking facilities are not typically considered or promoted in a similar fashion as green spaces, playgrounds, and sport facilities. Additionally, parking facilities provide access to all public spaces, which makes it difficult to regard them as purely recreational. Due to this practical reason, the relatively low factor loading, and improvement in consistency after deletion, 'parking facilities' will be removed from the factorial structure.

Therefore, the original independent variable 'satisfaction with social infrastructure' is split into two separate variables based on this two-factor solution: 'satisfaction with socio-economic spaces' (α = .86) and 'satisfaction with recreational spaces' (α = .85). The correlation between these indicators is weak (.09), which suggests that they are relatively distinct from each other. As a result, both dimensions will be used as two separate variables in the regression analysis. Lastly, the item 'school facilities' proved to be problematic as both factor solutions showed double loadings (loadings of .53 and .44 respectively). This makes it difficult to determine to which factor this item should belong to. However, schools can be

considered as both socio-economic and recreational spaces in practice. Schools are important institutions that contribute to the socio-economic development of a community, as well as providing recreational opportunities for students to engage in extracurricular activities (Lawanson & Gede, 2011). Therefore, 'satisfaction with school facilities' will be included in the analysis as a separate independent variable.

Moderator: District SES

Each neighbourhood and community in the BBGA has been categorised into its respective district to create the moderator district SES. This categorisation improves the clarity and replicability of this research, because it enables the analysis of social cohesion at a larger district-level, which provides a broader perspective and allows policymakers to create targeted policy measures.

Districts were compared in terms of average socio-economic status. In line with other studies, the degree to which residents receive social assistance (e.g., social welfare, specialised care, and housing) was taken into account to determine the level of deprivation and socio-economic status of a district (van Bergeijk et al., 2008; Brown & Sondaal, 2018).

Appendix IX illustrates that Centrum, Zuid, Oost, and West have relatively higher median incomes, lower unemployment rates, less low-educated residents, and lower rates of social assistance recipients compared to Noord, Zuid-Oost, and Nieuw-West. This difference in socio-economic status could highlight that residents of the former districts may have better access and higher quality social infrastructure, which could create discrepancies in terms of social opportunities and resources, and could foster unwanted behaviours that negatively affect social cohesion (van Bergeijk et al., 2008).

Hence, a moderator variable was created with two categories, whereby the four districts - Centrum, Zuid, Oost, and West- comprise the 'privileged' group (0), whereas the remaining three districts - Noord, Nieuw-West, and Zuid-Oost - were combined to create the 'deprived' group (1).

Control Variables

Previous research on the effects of the social infrastructure on social cohesion have proposed that cultural composition, as well as the perception of criminality within a neighbourhood can impact the degree of social cohesion between residents (van Bergeijk et al., 2008; Clarke et al., 2023; Schieffer & Van der Noll, 2016). Therefore, this study has included 'cultural composition' and 'perceived criminality' as control variables to examine potential changes in the effects on neighbourhood social cohesion.

Cultural Composition. This variable measures the degree of cultural diversity in a neighbourhood. The original variable only provides the percentage of people in a neighbourhood who are born outside of the Netherlands or who have at least one parent that is born in a foreign country. Countries include Morocco, Turkey, Surinam, the former Dutch Antilles, and remaining countries of continents in Africa, South-America, and Asia, with the exception of Indonesia and Japan.

A new variable was created and was coded with 'heterogeneous' (1) if the percentage of people in a neighbourhood who are born outside of the Netherlands is greater than or equal to a threshold of 25%, and coded as 'homogeneous' (0) otherwise. A homogeneous neighbourhood is one were most residents share the same cultural background, whereas a heterogeneous neighbourhood is one in which residents come from a variety of cultural backgrounds. Therefore, this variable is used as a proxy for cultural diversity, as it is assumed that people who are born outside of the country or have at least one parent from a foreign country are more likely to come from different cultural backgrounds.

Perceived Criminality. This variable measures the degree to which residents of Amsterdam experience inconvenience or nuisance by criminal activity. Previous studies have shown that high crime perception can negatively influence social cohesion (Clarke et al., 2023). Perceived criminality was measured on a 10-point Likert-scale, with answers ranging from "a lot of inconvenience" (1) to "little or no inconvenience" (10). For the purpose of this research, the variable was recoded so that a higher score represents higher perceived criminality among residents.

Table 2

Descriptive Statistics of (Number of Cases, Mean, Minimum, Maximum, and Standard Deviation)

	N	Mean	Min.	Max.	SD
Neighbourhood social cohesion	978	41.5	32.0	50.8	2.827
Satisfaction with socio-economic spaces	904	48.9	32.1	58.2	4.339
Satisfaction with recreational spaces	937	20.1	13.2	24.3	1.642
Satisfaction with school facilities	3752	7.1	3.6	8.8	.575
District SES [a]	14986	.4	0	1	.481
Cultural composition [b]	10843	.5	0	1	.500
Perceived criminality	4023	5.7	3.9	8.5	.674

Note.

[a] Reference category: District SES (0 = privileged and 1 = deprived)

[b] Reference category: Cultural Composition (0 = homogeneous and 1 = heterogeneous)

Descriptive results

Table 2 shows descriptive statistics for each variable. It is important to note that these results can vary between neighbourhoods. The mean score of neighbourhood social cohesion is 41.5 (min = 32.0; max = 50.8), which indicates that residents in Amsterdam generally have a moderate level of neighbourhood social cohesion. However, the standard deviation is quite large (SD = 2.827), which suggests that residents experience different levels of social cohesion in their neighbourhoods. The mean score of satisfaction with socio-economic spaces is 48.9 (min = 32.1; max = 58.2), which indicates that residents in Amsterdam generally have a high level of satisfaction with the socio-economic resources in their neighbourhoods. Again, the standard deviation is quite large (SD = 4.339), which suggests that residents largely differ in their satisfaction with socio-economic spaces. The mean score of satisfaction with recreational spaces is 20.1 (min = 13.2; max = 24.3; SD = 1.642), which indicates that residents in Amsterdam generally have a moderate to high level of satisfaction with the

recreational resources in their neighbourhoods. The mean score of satisfaction with school

facilities is 7.1 (min = 3.6; max = 8.8; SD = .575), which indicates that residents in

Amsterdam generally have a high level of satisfaction with the school facilities in their

neighbourhoods. The mean score of district SES is 0.4 (min = 0; max = 1; SD = .481), which

indicates that about 40% of residents live in deprived districts. The mean score of cultural

composition is .5 (min = 0; max = 1; SD = .500), which indicates that around 50% of

neighbourhoods in Amsterdam are heterogeneous or culturally-diverse. The mean score of

perceived criminality is 5.7 (min = 3.9; max = 8.5; SD = .449), which shows that residents of

Amsterdam perceive an tolerable degree of criminality in their neighbourhoods.

     Prior to the analysis, every continuous variable was standardised to a z-score (based

on the mean) to strengthen the degree of consistency, the reliability of the indicators, and the

statistical results in general (Field, 2012).

Results

The descriptive question has been answered prior to conducting the regression analysis, which posed the question on how residents of Amsterdam have evaluated social infrastructure in their neighbourhoods over the years. The descriptive results show the average satisfaction levels with socio-economic spaces (Figure 4), recreational spaces (Figure 5), and school facilities (Figure 6) in seven districts of Amsterdam over a period of 16 years (2005-2021). The satisfaction levels are measured from a scale of 1 to 10, with 1 being 'very dissatisfied' and 10 being 'very satisfied'. Missing scores were replaced with the most recent score for each mean score on socio-economic spaces. While this method may introduce some bias (Field, 2012), it provides reasonable estimates given the available data. This allows for valuable insights into which elements of the social infrastructure need the most attention from policymakers, if they were to impact neighbourhood social cohesion in Amsterdam.

Figure 4

Satisfaction of Socio-Economic Spaces from 2005 until 2021, Overall Average and Averages for Each District (1 = Very Dissatisfied, 10 = Very Satisfied) (N = 14986)
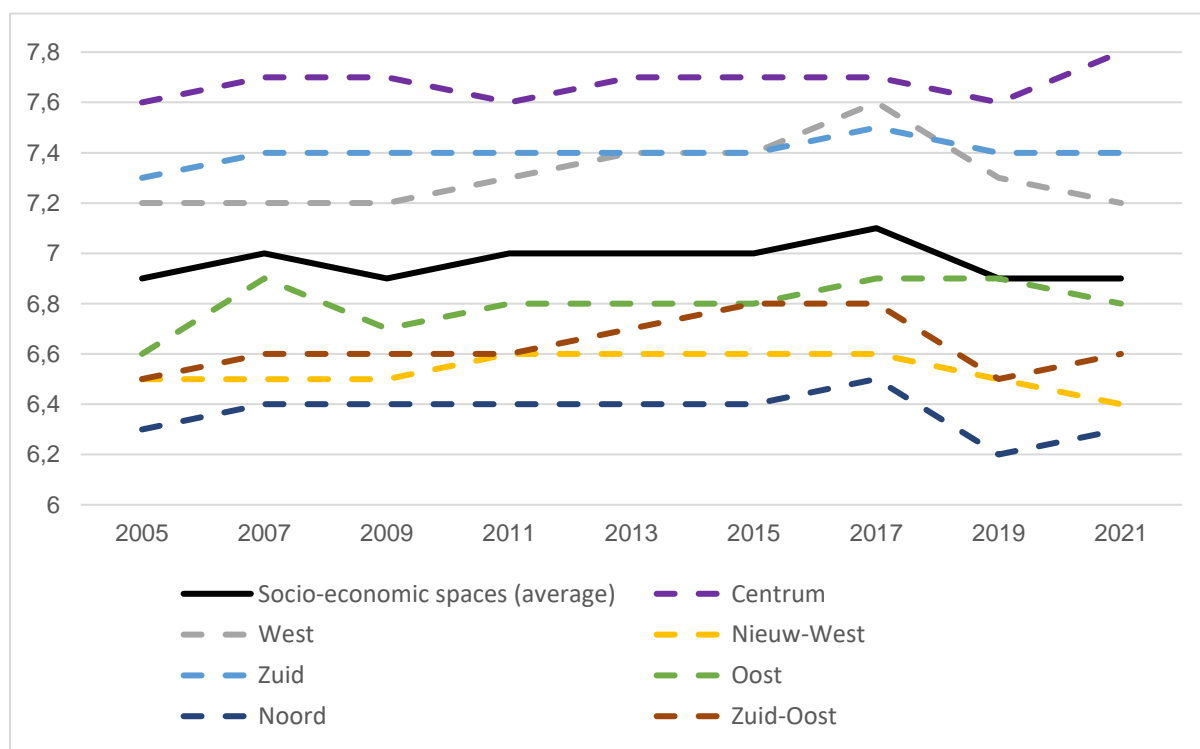
The average satisfaction with socio-economic spaces in Amsterdam has remained relatively stable over time, with an average of 6.9 in 2005 and in 2021. Satisfaction with socio-economic spaces has been highest in Centrum (average 7.7) and lowest in Noord (average 6.3). This stability could suggest that residents of Amsterdam have been generally satisfied with the quality of socio-economic spaces. However, deprived districts have scored structurally below average, which could suggest perceived differences in availability and quality of socio-economic spaces between different districts. It is important to note that these satisfaction levels may fluctuate between specific areas and thus might not represent all areas within a district.

Figure 5

Satisfaction of Recreational Spaces from 2005 until 2021, Overall Average and Averages for Each District (1 = Very Dissatisfied, 10 = Very Satisfied) (N = 14986)
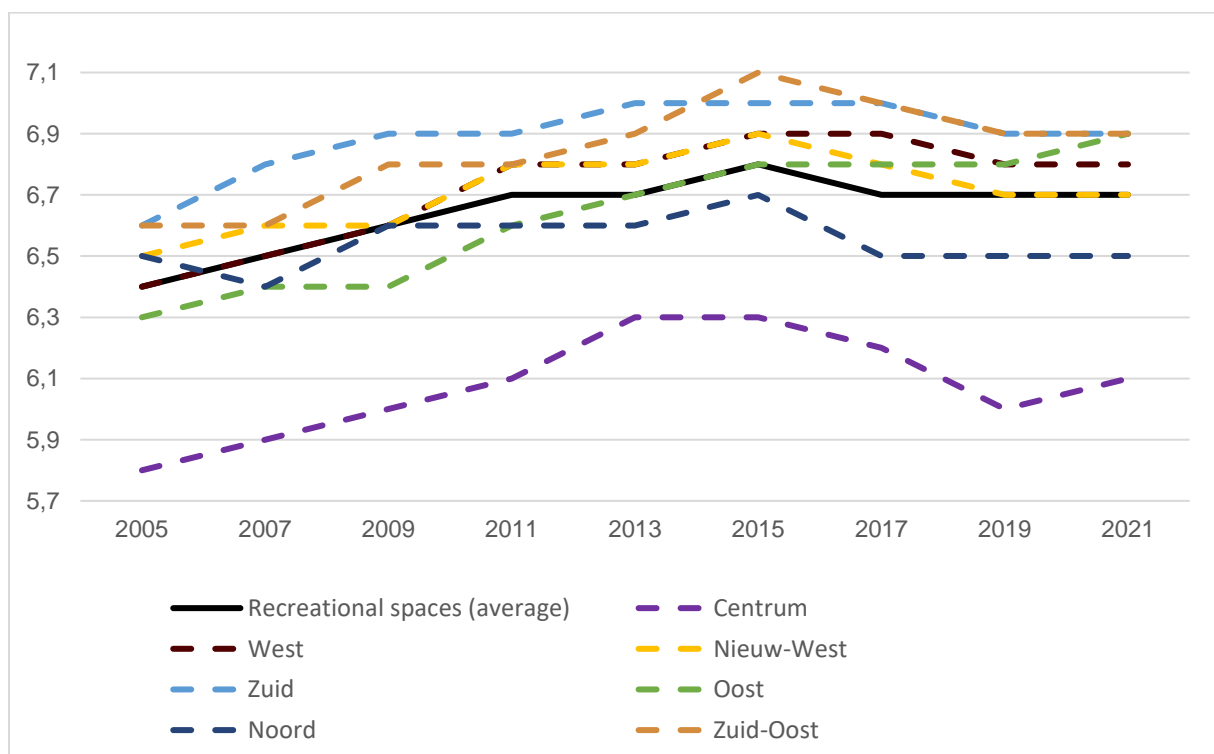

Satisfaction with recreational spaces in Amsterdam has increased from 6.4 in 2005 to 6.7 in 2021. This increase has been evident in all districts, but the magnitude of the increase

varies across districts. Oost has experienced the largest increase, with satisfaction levels increasing by 0.6 points. Noord has seen the least change, with satisfaction levels remaining at 6.5 in both 2005 and 2021. Centrum has scored relatively low compared to the other districts, but this could be explained by the high density of traffic and noise in this district. Overall, the increase in satisfaction levels suggests that residents of Amsterdam have been generally satisfied with the quality of recreational spaces.

Figure 6

Satisfaction of School Facilities from 2005 until 2021, Overall Average and Averages for Each District (1 = Very Dissatisfied, 10 = Very Satisfied) (N = 14986)
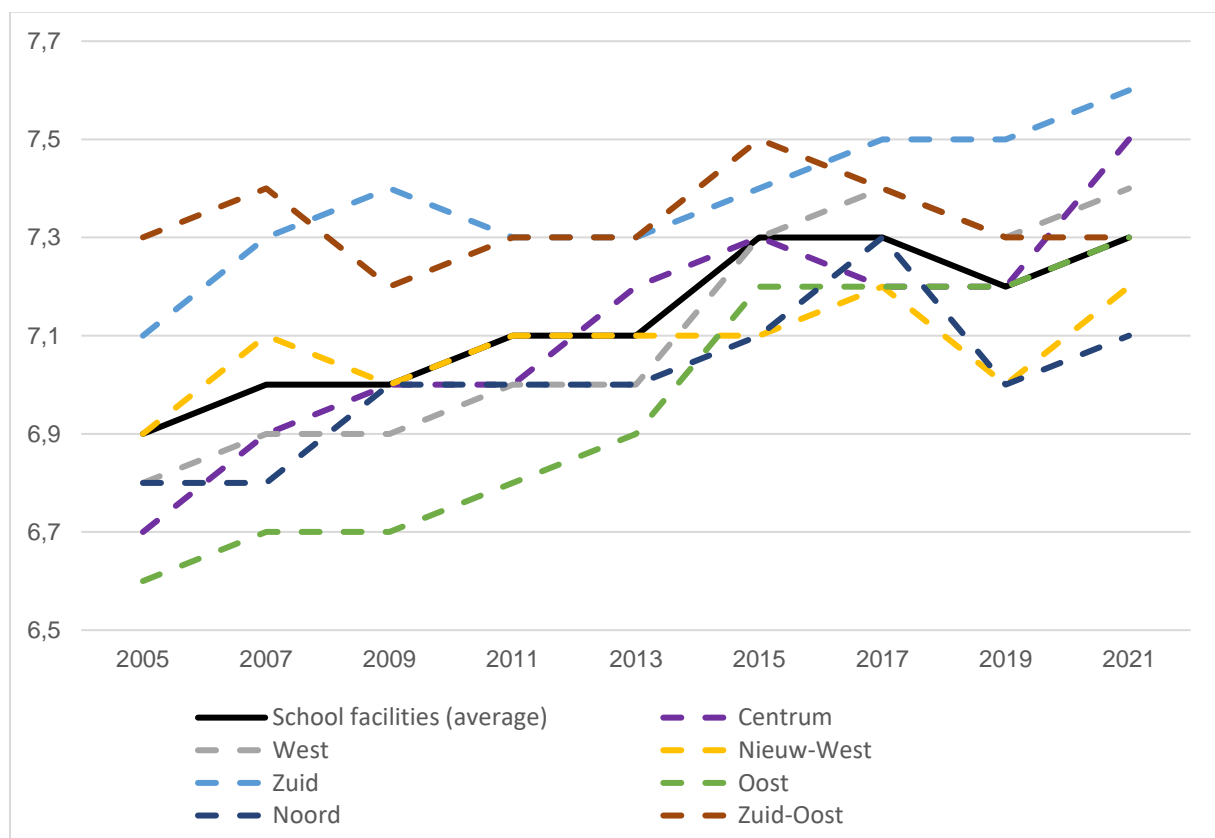
Satisfaction with school facilities in Amsterdam has increased from 6.9 in 2005 to 7.3 in 2021. This increase has been evident in six districts, but the degree of change varied between districts. Centrum, Oost, and Zuid have seen the largest increases, with satisfaction levels increasing by 0.8, 0.7, and 0.5 points, respectively. Zuid-Oost has seen the least change, with satisfaction levels remaining at 7.3 in both 2005 and 2021.

Overall, the increase in satisfaction levels suggests that residents of Amsterdam have been generally satisfied with the quality of school facilities. However, the fact that satisfaction levels with socio-economic spaces have stayed relatively stable throughout the years could suggest that these spaces may need more attention from policymakers.

Linear Regression Results

A linear regression analysis is performed to analyse the impact of the satisfaction with social infrastructure (IV) on neighbourhood social cohesion (DV), moderated by the districts' socio-economic status (privileged versus deprived), as well as controlling for cultural composition (homogeneous versus heterogeneous) and perceived criminality. Data was analysed using the statistical analysis software-programme SPSS (Version 28) (IBM, n.d.). Table 3 illustrates the results of two regression models measuring the effects on neighbourhood social cohesion.

Table 3

Linear Regression Results for Neighbourhood Social Cohesion

	Model 1		Model 2	
	B	SE	B	SE
Constant	.021	.029	.019	.028
Satisfaction socio-economic spaces	-.144***	.029	-.095**	.033
	(-.148)		(-.097)	
Satisfaction recreational spaces	.110***	.025	.056**	.027
	(.106)		(.054)	
Satisfaction school facilities	.230***	.029	.221***	.032
	(.221)		(.212)	
District SES [a]	-.026	.058	-.236***	.070
	(-.013)		(-.115)	

Cultural composition [b]	-.254***	.026	-.240***	.025
	(-.257)		(-.115)	
Perceived criminality	-.522***	.027	-.500***	.027
	(-.555)		(-.532)	
District SES * socio-economic spaces			-.293***	.068
			(-.155)	
District SES * recreational spaces			.400***	.062
			(.178)	
District SES * school facilities			-.072	.071
			(-.030)	
Adjusted R²	.616		.638	
F	237.424***		173.947***	

Note. N = 884. Unstandardised beta-coefficients and standard errors; standardised beta-coefficients in parentheses; * p < .05, ** p < .01, *** p < .001;

[a] Reference category: District SES (0 = privileged and 1 = deprived);

[b] Reference category: Cultural Composition (0 = homogeneous and 1 = heterogeneous).

Model 1 illustrates the main effects of the independent variables on neighbourhood social cohesion, as well as controlling for cultural composition and perceived criminality. The overall regression model was significant and explains 61.6% of the variances in scores of the dependent variable (R^2 = .616, $F_{(6, 877)}$ = 237.424, p < .001). The results show that satisfaction with socio-economic spaces is negatively related to neighbourhood social cohesion (B = -.144, p < .001). In contrast, the satisfaction with recreational spaces is positively associated with neighbourhood social cohesion (B = .110, p < .001). This suggests that the first hypothesis is partially confirmed, as higher satisfaction with recreational spaces is associated with stronger neighbourhood social cohesion (compared to lower satisfaction), but higher satisfaction with socio-economic spaces is associated with weaker neighbourhood

social cohesion (compared to lower satisfaction). Interestingly, higher satisfaction with school facilities is also associated with higher neighbourhood social cohesion (B = .230, p <. 001).

Additionally, model 1 shows the negative main effects of cultural composition (B = -.254, p <.001) and perceived criminality (B = -.522, p < .001) on neighbourhood social cohesion. These results suggest that residents of culturally-heterogenous neighbourhoods experience significantly weaker neighbourhood social cohesion than residents of culturally-homogeneous neighbourhoods. Furthermore, residents who perceive a high degree of crime in their local environment experience significantly lower neighbourhood social cohesion.

Model 2 adds three interaction terms, which test whether the impacts of the independent variables on neighbourhood social cohesion are moderated by district SES. Model 2 is significant and explains 64.2% of variance in scores on the dependent variable, which makes it a slightly better representation than model 1 (R^2 = .642, F (9, 874) = 173.947, p < .001). The results show that satisfaction with socio-economic spaces has a stronger negative influence on neighbourhood social cohesion for residents of deprived districts compared to residents of privileged districts (B = -.293, p < .001). However, the association between satisfaction with recreational spaces and neighbourhood social cohesion is positively stronger for residents in deprived districts compared to residents of privileged districts (B = .400, p < .001). These results suggest that residents of deprived districts experience a stronger negative relationship between the satisfaction with socio-economic spaces and neighbourhood social cohesion, as well as a stronger positive relationship between the satisfaction with recreational facilities and neighbourhood social cohesion compared to residents of privileged districts. Therefore, the second hypothesis is rejected, because predictions were that these effects would be weaker in deprived districts.

Conclusion and Discussion

This research aimed to investigate the extent to which residents' satisfaction with social infrastructure is associated with neighbourhood social cohesion in Amsterdam, and whether the strength of this association varied between socio-economically privileged and deprived districts. Based on the place attachment theory, the first prediction was that a higher satisfaction with social infrastructure, regardless of the type, would positively influence neighbourhood social cohesion. Based on the social disorganisation theory, the second expectation was that this association would be weaker in deprived districts compared to privileged districts due to indirect factors (e.g., crime and littering). Linear regression analysis was used to test these predictions, using data of the BBGA.

Conclusions

As expected, higher satisfaction with recreational spaces is positively associated with neighbourhood social cohesion. This finding supports the place attachment theory, which argues that residents who have a positive connection with their neighbourhood are more likely to engage in social interactions and shared activities within the social infrastructure. Ultimately, these spaces develop a sense of cohesion among neighbours (Forrest & Kearns, 2001). These are similar to the findings of Hemani et al. (2018) and Palliwoda and Priess (2021). Both studies have found that higher access to recreational spaces contributes positively to social cohesion. However, other studies have found the opposite. For example, Bennett et al. (2012) have found that playgrounds can negatively impact neighbourhood social cohesion, as playgrounds often facilitate social interaction between parents rather than parentless neighbours, which can foster exclusivity and harm social cohesion. Therefore, the findings of this study should be interpreted with precaution.

Contrary to the expectation, higher satisfaction with socio-economic spaces is negatively associated with neighbourhood social cohesion, residents who are satisfied with socio-economic spaces experience lower levels of neighbourhood social cohesion. A possible explanation could be that socio-economic spaces in certain neighbourhoods in Amsterdam are exclusive and impenetrable to certain social groups, possibly due to the semi-private

nature of these spaces (Horgan et al., 2022). Additionally, if residents are satisfied with socio-economic spaces in their neighbourhood, they are less likely to visit other neighbourhoods, where they might have the opportunity to meet people from different backgrounds (Simons et al., 2016). These findings are similar to the those of van Bergeijk et al. (2008), who found that visiting a neighbourhood cafe or restaurant once a month can positively affect neighbourhood social cohesion. However, this could suggest that only those who can afford to visit these places benefit, while those who cannot afford to visit them may miss out on certain opportunities to socially interact with neighbours, despite them being satisfied with the availability and quality of these spaces.

Contrary to the second prediction, the association between satisfaction with social infrastructure and social cohesion was stronger for residents of deprived districts than residents of privileged districts. Findings suggest that satisfaction with recreational spaces is more influential in promoting social cohesion in deprived districts compared to privileged districts. These spaces provide opportunities for people to interact with each other in a casual and relaxed setting, which can foster familiarity, trust, safety, and ultimately social cohesion among residents of deprived districts (Blokland, 2009). In deprived districts, socio-economic spaces have a stronger negative association with social cohesion in deprived districts compared to privileged districts. An explanation could be derived from the social disorganisation theory, as residents of deprived neighbourhoods often face more social and economic challenges compared to privileged residents (van Bergeijk et al., 2008). As a result, these challenges could hinder the use of social infrastructure among deprived residents, which can hamper the development of social cohesion within the community (Bailey et al., 2012).

Regarding the research question of this study, the findings suggest that social infrastructure can play a significant role in promoting social cohesion, and that the type of social infrastructure that is most effective may vary depending on the socio-economic context of a district. These findings carry important implications for future research and

policymakers as they could be used to design more inclusive and accessible social infrastructure to promote neighbourhood social cohesion.

Limitations and Strengths

This study has several limitations and findings should be interpreted with caution. First, the used BBGA-data measured up to 2021, which makes it difficult to determine the long-term impact of the COVID-19 pandemic on social cohesion in Amsterdam. Additionally, the data only includes information on the city of Amsterdam, which limits the generalisability of the findings. Furthermore, this study was cross-sectional in nature, which means that causality cannot be established between the satisfaction levels with of social infrastructure and neighbourhood social cohesion. Future research can address these limitations by examining the dynamics of this relationship over time and in various contexts to identify other possible mechanisms.

Another limitation pertains to the operationalisation of satisfaction with social infrastructure, particularly the distinction between socio-economic and recreational spaces. Even though factor analysis suggested that these categories should be made, there are still differences between the types of public spaces within these groups, particularly among socio-economic spaces. For example, community centres and healthcare facilities have different purposes compared to hospitality venues and cultural spaces (i.e. health versus entertainment purposes). Additionally, Wan et al. (2022) have found that the effect of green spaces on social cohesion can vary depending on the type of green space (e.g., community garden or allotment gardens). To address this limitation, future research should strive to develop more refined methods to distinguish between various types of public spaces, as this enhances the accuracy of the results. Moreover, future research can focus on taking the density and size of the community into account, as previous research has shown that high density and large community size could negatively impact place attachment and neighbourhood social cohesion (Lewicka, 2011).

A strength of this research relates to the moderator, as the distinction between privileged and deprived districts improves the clarity and replicability for future research. It

also provides a deeper understanding of the findings by identifying specific contextual factors that may be contributing to the stronger association in deprived districts. However, it is important to note that there could be more pronounced differences within districts. Therefore, future research should examine this relationship on local levels. Additionally, a recommendation for future research is to focus on deprived districts, particularly regarding the relatively low satisfaction levels with socio-economic spaces,. This may indicate a lack of access or weakened connective power of these spaces among certain residents of deprived districts (Figure 4).

Another strong aspect of this study is the inclusion of cultural composition and perceived criminality as control variables. This improved the reliability and made the findings more representative of the real world, because it controlled for other factors that could potentially influence the results. All future research should take these factors into account as it has been shown that cultural composition and perceived criminality can influence the connective power of social infrastructure and neighbourhood social cohesion (Bailey et al., 2012; van Bergeijk et al., 2008; Clarke et al., 2023).

Policy recommendations

Despite numerous limitations and partial confirmation or rejection of hypotheses, several findings can be translated into recommendations for policymakers in Amsterdam by answering the policy question of this study: *What measures can be implemented to enhance the accessibility of social infrastructure in Amsterdam, specifically targeting the promotion of meaningful participation among the most vulnerable residents?*

Based on the findings, the main policy recommendation is to enhance the accessibility and inclusivity of social infrastructure, particularly spaces that require some form of paid access, as these may currently exclude vulnerable groups. The following section outlines two policy strategies to potentially achieve this goal: enhancing bonding and bridging social capital, and the expansion of participatory budgeting. Additionally, these recommendations offer ideas for policymakers to foster meaningful participation among vulnerable residents in Amsterdam.

Enhancing Bonding and Bridging Social Capital

Bonding social capital is created when individuals with similar characteristics and backgrounds form strong social bonds (Putnam, 2000). These bonds are often based on shared interests, identities, or experiences. Bridging social capital is created when individuals from diverse backgrounds or social groups establish connections. These connections have the potential to bring different individuals together and break down social barriers, which can promote social cohesion and inclusivity within neighbourhoods (van de Kamp & Welschen, 2019; Kullberg, 2019; Veldboer et al., 2007).

Previous studies have highlighted the limited interaction between different social groups in Amsterdam, primarily among native and non-native residents, as well as those from different socio-economic backgrounds (Tonkens & de Wilde, 2013; Veldboer & Duyvendak, 2001). Hence, the Municipality of Amsterdam, as outlined in their policy research report "Traject Verbonden Stad", has set a goal to actively encourage social interaction between diverse social groups to enhance residents' bridging social capital

(Uitermark, 2021). Forrest and Kearns (2001) have suggested that local initiatives have the potential to enhance both types of social capital among residents of a neighbourhood.

However, local initiatives that focus on enhancing contact between different social groups (i.e. bridging social capital) have often been subsidised by the municipality, while residents that organise activities within their own circles (i.e. bonding social capital) have received little to no subsidy (van de Kamp & Welschen, 2019; Municipality of Amsterdam, 2021). Previous research has argued that vulnerable groups in Noord benefited more from bonding social capital, because their strong relationships often provided social and emotional support that help them cope with the demands of daily life (van de Kamp & Welschen, 2019). However, excessive reliance on bonding capital can lead to various forms of exclusion, as high expectations and support within the group may constrain individual freedom (Dominquez & Arford, 2010).

Therefore, policymakers are advised to invest in the combination of bonding and bridging social initiatives. This approach would enable residents of Amsterdam to reinforce their close connections within their own circles, while also developing a certain level of public familiarity with those who are more distant from them (Horgan et al., 2022). As a result, the risk of social isolation and exclusion could decrease, which is particularly useful to the vulnerable groups in Amsterdam. The potential benefit of participatory budgeting will be discussed in the following section to substantiate this recommendation.

Expansion of Participatory Budgeting

Several studies have argued that participatory budgeting (PB) ("buurtbudget" or "buurtbegroten") has the potential to conceive social initiatives, improve social infrastructure, cultivate social cohesion, and promote meaningful participation of vulnerable individuals (Hartog & Bakker, 2018; Lehtonen, 2021; Röcke, 2014). Every year, PB allows residents to submit plans to improve social infrastructure in their respective neighbourhoods. Since 2019, the Municipality of Amsterdam has been experimenting with PB and its first iteration was introduced in a diverse and relatively deprived neighbourhood (Cipolla et al., 2015). Due to its success, PB has been implemented in every other district and over 1,000

projects have been proposed since its launch (Municipality of Amsterdam, 2022). Overall, PB has been praised for its ability to engage residents in decision-making processes (Hartog & Bakker, 2018; Lehtonen, 2021).

Furthermore, PB has the potential to enhance both bonding and bridging social capital among residents, because the policy instrument enables residents to organise local events, community workshops, or other neighbourhood projects that actively encourage interaction between and within social groups (Municipality of Amsterdam, n.d.). This year, the New-West district has introduced a PB-related policy, whereby a minimum of 30% of the budget for neighbourhood projects must be reserved for 'social projects' (Fisser, 2023). This means that local authorities have to actively incentivise residents to submit plans that the entire neighbourhood could benefit from. This measure has the potential to enhance the bonding and bridging capital among residents within their respective neighbourhoods, which is particularly useful for vulnerable groups within the city. Therefore, it is recommended that policymakers expand this measure to include other districts, with a particular focus on deprived areas where residents with relatively low SES reside, such as Noord and Zuid-Oost districts (Table 2).

Nonetheless, PB has several cost implications, as the Municipality of Amsterdam spends an estimated 14,3 million euros per year on this policy instrument (Muncipality of Amsterdam, 2022). This study will propose ideas for policymakers to minimise the costs of PB. Firstly, residents should be heavily involved in the planning and implementation of projects, as this can increase the likelihood of satisfaction with the results. In turn, this may reduce the number of complaints and appeals, which saves time and opportunity costs (Lehtonen, 2021).

Secondly, local authorities should proactively establish a community network through PB for participating residents. This community network would serve as a valuable platform for residents to share ideas, needs, concerns, and priorities, which is especially important for groups that often feel excluded from decision-making processes (Lehtonen, 2021). In theory, this could be a win-win scenario for residents and authorities. On one hand, authorities can

tap into the expertise and resources of the community, which saves costs in the long-term as resources can be exchanged more efficiently (Hartog & Bakker, 2018). On the other hand, residents can enhance their social capital through a community network, as it provides them with more feasible opportunities to improve their socio-economic position. It is also important to note that this network should preferably consist of both socio-economically weak and strong residents, as this will otherwise an exclusive platform that reinforces existing inequalities (Lethonen, 2021). Further research needs to examine whether PB has the potential to cultivate social capital and positively influence residents' socio-economic position. As a result, policymakers can not only strengthen the engagement and participation with respect to PB, but also ensure that neighbourhood social infrastructure can become more vibrant and inclusive for every Amsterdam resident.

References

Aelbrecht, P., & Stevens, Q. (2023). Geographies of encounter, public space, and social cohesion: Reviewing knowledge at the intersection of social sciences and built environment disciplines. *Urban Planning*, *8*(4), 1-16. https://doi.org/10.17645/up.v8i4.6540

Alizadeh, H., & Sharifi, A. (2022). Social resilience promotion factors during the COVID-19 pandemic: Insights from Urmia, Iran. *Urban Science*, *6*(1), 14. https://doi.org/10.3390/urbansci6010014

Bailey, N., Kearns, A., & Livingston, M. (2012). Place attachment in deprived neighbourhoods: The impacts of population turnover and social mix. *Housing Studies*, *27*(2), 208-231. https://doi.org/10.1080/02673037.2012.632620

Beaulieu, A. (2010). From co-location to co-presence: Shifts in the use of ethnography for the study of knowledge. *Social Studies of Science*, 40(3), 453-470. https://doi.org/10.1177/0306312709359219

van Bergeijk, E., Bolt, G., & van Kempen, R. (2008). Social cohesion in deprived neighbourhoods in the Netherlands: The effect of the use of neighbourhood facilities. *Housing Studies Association Conference,* 2-4.

Bína, V., & IJdens, T. (2008). *Social participation and cultural policy: A position paper*. Ministerie van Onderwijs, Cultuur en Wetenschap.

Blokland, T. V. (2009). Het belang van publieke familiariteit in de openbare ruimte. *B en M: Tijdschrift voor Beleid, Politiek en Maatschappij*, *3*(36), 183-191.

Brown, L., & Sondaal, A. (2016). *Health survey for England 2016: Social care for older adults*. Health and Social Care Information Centre. https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/health-survey-for-england-2016

Bollen, K. A., & Hoyle, R. H. (1990). Perceived cohesion: A conceptual and empirical examination. *Social Forces, 69*(2), 479–504. http://doi.org/10.1093/sf/69.2.479.

Bosmans, M., de Vetten-McMahon, M., Alblas, E., van Duinkerken, L., van Leersum-Bekebrede, L., Heshusius, J., de Kort, E., Rahmon, I., Wentink, B., Willems, P., Stekelenburg, R., Moleman, Y., Marra, E., & Dückers, M. (2022). *De gevolgen van de coronapandemie voor de gezondheid en het welzijn: Deel 2. Een literatuurstudie.* Rijksinstituut voor Volksgezondheid en Milieu (RIVM). http://dx.doi.org/10.21945/Nivel-RIVM-2022-0124

Chan, J., To, H. P., & Chan, E. (2006). Reconsidering social cohesion: Developing a definition and analytical framework for empirical research. *Social Indicators Research*, *75*(2), 273-302. http://dx.doi.org/10.1007/s11205-005-2118-1

Clarke, M., Wallace, C., Cadaval, S., Anderson, E., Egerer, M., Dinkins, L., & Platero, R. (2023). Factors that enhance or hinder social cohesion in urban greenspaces: A literature review. *Urban Forestry & Urban Greening*, *84*, 1-13. https://doi.org/10.1016/j.ufug.2023.127936

Coen, S. E., Ross, N. A., & Turner, S. (2008). "Without tiendas it'sa dead neighbourhood": The socio-economic importance of small trade stores in Cochabamba, Bolivia. *Cities*, *25*(6), 327-339. https://doi.org/10.1016/j.cities.2008.06.003

Coley, R. L., Sullivan, W. C., & Kuo, F. E. (1997). Where does community grow? The social context created by nature in urban public housing. *Environment and Behavior*, *29*(4), 468-494.

Durkheim, E. (2014). The division of labor in society. In A. Giddens (Ed.), *Theoretical traditions in the social sciences* (pp. 1-412). The Macmillan Press.

Domínguez, S., & Arford, T. (2010). It is all about who you know: Social capital and health in low-income communities. *Health Sociology Review, 19*(1): 114-129.

Engbersen, G., van Bochhove, M., de Boom, J., Burgers, J., Custers, G., Erdem , Ö., Krouwel, A., van Lindert , J., Snel, E., van Toorn, M., van Wensveen, P., & Wentink, T. (2020). *De bedreigde stad: De maatschappelijke impact van COVID-19 op Rotterdam.* Kenniswerkplaats Leefbare Wijken. https://www.eur.nl/essb/media/2020-04-rapportdebedreigde-stad

Engbersen, G., Snel, E., & Kremer, M. (2017). *De val van de middenklasse?: Het stabiele en kwetsbare midden*. Wetenschappelijke Raad voor het Regeringsbeleid (WRR). https://repub.eur.nl/pub/113902/

Erdem, Ö., Prins, R. G., Voorham, T. A., Van Lenthe, F. J., & Burdorf, A. (2015). Structural neighbourhood conditions, social cohesion and psychological distress in the Netherlands. *European Journal of Public Health*, *25*(6), 995-1001.

Feinberg, A., Ghorbani, A., & Herder, P. M. (2023) Commoning toward urban resilience: The role of trust, social cohesion, and involvement in a simulated urban commons setting. *Journal of Urban Affairs*, *45*(2), 142-167. https://doi.org/10.1080/07352166.2020.1851139

Field, A. (2012). *Discovering statistics using SPSS*. IBM.

Fisser, C. (2023, April 18). *Minimaal 30 procent van het buurtbudget Nieuw-West 2023 voor sociale plannen*. https://westersite.nl/uitgelicht/minimaal-30-van-het-buurtbudget-nieuw-west-2023-voor-sociale-plannen

Forrest, R., & Kearns, A. (2001). Social cohesion, social capital and the neighbourhood. *Urban Studies*, *38*(12), 2125-2143.

Giddens, A. (1984). *Elements of the theory of structuration*. Routledge.

Goffman, E., & Manning, P. (2010). *The territories of the self*. Routledge.

Groeneweg, N. (2019, February 25). *Hulp aan digibeten schiet te kort*. Digitale Overheid. https://www.digitaleoverheid.nl/nieuws/hulp-aan-de-digibeten-schiet-te-kort/

de Haas, M., Faber, R., & Hamersma, M. (2020). How COVID-19 and the Dutch 'intelligent lockdown' change activities, work and travel behaviour: Evidence from longitudinal data in the Netherlands. *Transportation Research Interdisciplinary Perspectives*, *6*, 1-14. https://doi.org/10.1016/j.trip.2020.100150

Hartog, M., & Bakker, K. (2018). Participatory budgeting in public administrations: Barriers and opportunities for a transparent government. *Proceedings of the European Conference on e-Government*.

Hemani, S., Das, A. K., & Chowdhury, A. (2017). Influence of urban forms on social sustainability: A case of Guwahati, Assam. *Urban Design International*, *22*, 168-194.

Hoekstra, M. S., & Dahlvik, J. (2018). Neighbourhood participation in super-diverse contexts: Comparing Amsterdam and Vienna. *Urban Research & Practice, 11*(4), 441-459.

Holtan, M. T., Dieterlen, S. L., & Sullivan, W. C. (2015). Social life under cover: Tree canopy and social capital in Baltimore, Maryland. *Environment and Behavior, 47*(5), 502-525.

Horgan, M., Liinamaa, S., MacLeod, K. K., McIlwraith, T., Hunter, D., Wilson, E., & Xu, M. (2022). Spaces of sociability: Enhancing co-presence and communal life in Canada. *Social Sciences and Humanities Research Council of Canada,* 1-70.

Jaffar, N., Harun, N. Z., & Abdullah, A. (2020). Enlivening the mosque as a public space for social sustainability of traditional Malay settlements. *Planning Malaysia*, *18*(12), 1-13. https://doi.org/10.21837/pm.v18i12.750

Jennings, V., & Bamkole, O. (2019). The relationship between social cohesion and urban green space: An avenue for health promotion. *International Journal of Environmental Research and Public Health*, *16*(3), 452.

Jenson, J. (2010). *Defining and measuring social cohesion*. Commonwealth Secretariat and United Nations Research Institute for Social Development.

Jones, H., Neal, S., Mohan, G., Connell, K., Cochrane, A., & Bennett, K. (2015). Urban multiculture and everyday encounters in semi-public, franchised cafe spaces. *Sociological Review*, *63*(3), 644–661. https://doi.org/10.1111/1467-954X.12311

Hale, J., Knapp, C., Bardwell, L., Buchenau, M., Marshall, J., Sancar, F., & Litt, J. S. (2011). Connecting food environments and health through the relational nature of aesthetics: Gaining insight through the community gardening experience. *Social Science & Medicine, 72*(11), 1853-1863. https://doi.org/10.1016%2Fj.socscimed.2011.03.044

Hammitt, W. E., Backlund, E. A., & Bixler, R. D. (2006). Place bonding for recreation places: Conceptual and empirical development. *Leisure Studies*, *25*(1), 17-41. https://doi.org/10.1080/02614360500098100

Holtan, M. T., Dieterlen, S. L., & Sullivan, W. C. (2015). Social Life Under Cover: Tree Canopy and Social Capital in Baltimore, Maryland. *Environment and Behavior*, *47*(5), 502–525. https://doi.org/10.1177/0013916513518064

van de Kamp, L., & Welschen, S. (2019). Sociale cohesie in gentrificerende arbeiderswijken van Amsterdam-Noord. *Beleid en Maatschappij*, *46*(3), 366–389. https://doi.org/10.5553/benm/138900692019046003004

Kearns, A., & Forrest, R. (2000). Social cohesion and multilevel urban governance. *Urban Studies*, *37*(5-6), 995-1017. http://dx.doi.org/10.1080/00420980050011208

Kearns, A., & Parkes, A. (2003). Living in and leaving poor neighbourhood conditions in England. *Housing Studies*, *18*(6), 827-851. http://dx.doi.org/10.1080/0267303032000135456

Klinenberg, E. (2018). *Palaces for the people: How to build a more equal and united society*. Penguin Random House.

Koester, A. (2022). Why face-to-face communication matters: A comparison of face-to-face and computer-mediated communication. In F. Rossette-Crake & E. Buckwalter (Eds.), *COVID-19, communication and culture*: *Beyond the global workplace* (pp. 115–133). Routledge. https://doi.org/10.4324/9781003276517

Kullberg, J. (2009). *Interventies in de wijk. waarom? Waar? En waarom daar*. Van Gorcum.

Kuo, H. M., Su, J. Y., Wang, C. H., Kiatsakared, P., Chen, K. Y. (2021). Place attachment and environmentally responsible behavior: The mediating role of destination psychological ownership. *Sustainability*, *13*(12), 1-16. https://doi.org/10.3390/su13126809

Latham, A., & Layton, J. (2019). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. *Geography Compass*, *13*(7), 1-15. https://doi.org/10.1111/gec3.12444

Latham, A., & Layton, J. (2022). Social infrastructure: why it matters and how urban geographers might study it. *Urban Geography*, *43*(5), 659-668. https://doi.org/10.1080/02723638.2021.2003609

Latham-Mintus, K., & Miller, K. (2019). Social cohesion, transportation, and participation in social activities among older adults. *Innovation in Aging*, *3*(1), 215. https://doi.org/10.1093/geroni/igz038.788

Lawanson, O. A., & Gede, N. T. (2011). Provision and management of school facilities for the implementation of UBE programme. *Journal of Educational and Social Research*, *1*(4), 47-55.

Lehtonen, O. (2021). Primary school closures and population development–is school vitality an investment in the attractiveness of the (rural) communities or not? *Journal of Rural studies*, *82*, 138-147.

Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, *31*(3), 207–230. https://doi.org/10.1016/j.jenvp.2010.10.001

Maller, C., Mumaw, L., & Cooke, B. (2019). Health and social benefits of living with 'wild' nature. In N. Pettorelli, S. Durant, & J. Du Toit (Eds.), *Rewilding* (pp. 165-181). Cambridge University Press. https://doi.org/10.1017/9781108560962.009

Mangadu, T., Kelly, M., Orezzoli, M. C. E., Gallegos, R., & Matharasi, P. (2016). Best practices for community gardening in a US–Mexico border community. *Health Promotion International*, *32*(6), 1001-1014. https://doi.org/10.1093/heapro/daw025

Marcus, L., & Legeby, A. (2012, January 17). *The need for co-presence in urban complexity: Measuring social capital using space syntax*. Paper presented at the Eigth International Space Syntax Symposium, Norway. diva2:470211

Markowitz, F. E., Bellair, P. E., Liska, A. E., & Liu, J. (2001). Extending social disorganization theory: Modeling the relationships between cohesion, disorder, and fear. *Criminology*, *39*(2), 293-319. https://doi.org/10.1111/j.1745-9125.2001.tb00924.x

van der Meer, T., & Tolsma, J. (2014). Ethnic diversity and its effects on social cohesion. *Annual Review of Sociology*, *40*(1), 459-478. https://dx.doi.org/10.1146/annurev-soc-071913-043309

Mesch, G. S., & Manor, O. (1998). Social ties, environmental perception, and local attachment. *Environment and Behavior*, *30*(4), 504-519. https://doi.org/10.1177/001391659803000405

Mikhailovna, T. Y. (2020). Basic aspects of rural social infrastructure development. *International Review*, (3-4), 98-104. https://doi.org/10.5937/INTREV2003098Y

Municipality of Amsterdam. (2021). *Staat van de stad*. Gemeente Amsterdam. https://onderzoek.amsterdam.nl/dossier/staat-van-de-stad

Municipality of Amsterdam. (n.d.). *Gebied in beeld*. https://gebiedinbeeld.amsterdam.nl/

National Institute of Social Research (2020, May 18). *Zicht op de samenleving in coronatijd: Eerste analyse van de mogelijke maatschappelijke gevolgen en implicaties voor beleid*. https://www.scp.nl/publicaties/publicaties/2020/05/18/zicht-op-de-samenleving-in-coronatijd

de Visser, M., Boot, A. W. A., Werner, G. D. A., van Riel, A., & Gijsberts, M. I. L. (2022). *Kiezen voor houdbare zorg*. Wetenschappelijke Raad voor het Regeringsbeleid (WRR).   https://www.wrr.nl/publicaties/rapporten/2021/09/15/kiezen-voor-houdbare-zorg

Noone, S., & Jenkins, N. (2017). Digging for dementia: Exploring the experience of community gardening from the perspectives of people with dementia. *Aging & Mental Health, 22*(7), 881-888. http://dx.doi.org/10.1080/13607863.2017.1393793

Peters, K. (2010). Being together in urban parks: Connecting public space, leisure, and diversity. *Leisure Sciences*, *32*(5), 418-433. https://doi.org/10.1080/01490400.2010.510987

Putnam, R.D. (2000). *Bowling alone: America's declining social capital.* Palgrave Macmillan.

Röcke, A. (2014). *Framing citizen participation: Participatory budgeting in France, Germany and the United Kingdom*. Palgrave Macmillan.

Schiefer, D., & van der Noll, J. (2017). The essentials of social cohesion: A literature review. *Social Indicators Research*, *132*(2), 579–603. https://doi.org/10.1007/s11205-016-1314-5

Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas.* University of Chicago Press.

Shumaker, S. A., & Taylor, R. B. (1983). Toward a clarification of people-place relationships: A model of attachment to place. In N. R. Feimer, & E. S. Geller (Eds.), *Environmental psychology: Directions and perspectives* (pp. 219-251). Praeger.

Simola, A., May, V., Olakivi, A., Wrede, S. (2022). On not 'being there': Making sense of the potent urge for physical proximity in transnational families at the outbreak of the COVID-19 pandemic. *Global Networks*, *23*(1), 45–58. https://doi.org/10.1111/glob.12382

Simons, T., Vermeulen, P. A., & Knoben, J. (2016). There's no beer without a smoke: Community cohesion and neighboring communities' effects on organizational resistance to antismoking regulations in the Dutch hospitality industry. *Academy of Management Journal*, *59*(2), 545-578.

Statistics Netherlands. (n.d.). *Leefbaarheid en overlast in buurt*. Centraal Bureau voor de Statistiek (CBS). https://opendata.cbs.nl/statline/#/CBS/nl/

Werner, C. H., Tang, M., Kruse, J., Kaufman, J. C., & Spörrle, M. (2014). The Chinese version of the Revised Creativity Domain Questionnaire (CDQ-R): First evidence for its factorial validity and systematic association with the Big Five. *The Journal of Creative Behavior*, *48*(4), 254-275. http://dx.doi.org/10.1002/jocb.51

Teig, E., Amulya, J., Bardwell, L., Buchenau, M., Marshall, J. A., & Litt, J. S. (2009). Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health

through community gardens. *Health & Place, 15(*4), 1115-1122.

https://doi.org/10.1016/j.healthplace.2009.06.003

Testa, L., Parra-Camacho, D., Gómez-Tafalla, A. M., Garcia-Pascual, F., & Duclos-Bastías, D. (2023). Local impact of a sports centre: Effects on future intentions. *Sustainability*, *15*(6), 5550. http://dx.doi.org/10.3390/su15065550

Tolsma, J., Van der Meer, T., & Gesthuizen, M. (2009). The impact of neighbourhood and municipality characteristics on social cohesion in the Netherlands. *Acta Politica*, *44*(3), 286-313. https://doi.org/10.1057/ap.2009.6

Tonkens, E., & de Wilde, M. (2013). *Als meedoen pijn doet. Affectief burgerschap in de wijk*. Van Gennep.

Uitermark. (2021). *Traject verbonden stad*. Gemeente Amsterdam. https://openresearch.amsterdam/nl/page/68726/traject-verbonden-stad

Veen, E. J., Bock, B. B., van den Berg, W., Visser, A. J., & Wiskerke, J. S. C. (2016). Community gardening and social cohesion: Different designs, different motivations. *Local Environment, 21*(10), 1271-1287.

Veldboer, L., & Duyvendak, J. W. (2001). *Integratie en de multiculturele samenleving: overmengen, spreiden en ontmoeten*. Boom.

Veldboer, L., Duyvendak, J. W., & Bouw, C. (2007). *De mixfactor: integratie of segregatie in Nederland*. Boom.

Vine, T. (2023). Is physical co-presence a prerequisite for Durkheimian collective effervescence? Reflections on remote working during the COVID-19 pandemic. *Culture and Organization*, 1-17. https://doi.org/10.1080/14759551.2023.2201004

Wan, C., Shen, G. Q., & Choi, S. (2021). Underlying relationships between public urban green spaces and social cohesion: A systematic literature review. *City, Culture and Society*, *24*, 1-35. https://doi.org/10.1016/j.ccs.2021.100383.

Wickes, R., Zahnow, R., Corcoran, J., & Hipp, J. R. (2019). Neighbourhood social conduits and resident social cohesion. *Urban Studies, 56*(1), 226-248. https://doi.dox.org/10.1177/0042098018780617

Wilkinson, J., Walsh, L., Keddie, A., Howie, L., Sum, N., & Longmuir, F. (2020). *Leading for social cohesion: The key role of schools*. The Centre for Strategic Education.

Windsong, E. A. (2010). There is no place like home: Complexities in exploring home and place attachment. *The Social Science Journal*, *47*(1), 205-214. https://doi.org/10.1016/j.soscij.2009.06.009

Witten, K., & Ivory, V. (2018). Urban public spaces, social inclusion and health. In V. Crooks, G. Andrews, & J. Pearce. (Eds.), *Routledge handbook of health geography* (pp. 259-266). Routledge. https://doi.org/10.4324/9781315104584

Xi, G., Cao, X., & Zhen, F. (2021). How does same-day-delivery online shopping reshape social interactions among neighbors in Nanjing? *Cities*, *114,* 103219. https://doi.org/10.1016/j.cities.2021.103219

Appendices

Appendix I.

Ethical Approval Form of the Ethics Committee

	Faculty of Social and Behavioural Sciences
P.O. Box 80140, 3508 TC Utrecht The Board of the Faculty of Social and Behavioural Sciences Utrecht University P.O. Box 80.140 3508 TC Utrecht	Faculty Support Office Ethics Committee **Visiting Address** Padualaan 14 3584 CH Utrecht

Our Description	23-0676	
Telephone	030 253 46 33	
E-mail	FETC-fsw@uu.nl	
Date	18 March 2023	
Subject	Ethical approval	

ETHICAL APPROVAL

Study: The Power of Place: Investigating the Influence of Neighbourhood Satisfaction on Social Cohesion within the City of Amsterdam

Principal investigator: D.S.M. Bayoumi

Supervisor: Noël Koster

The study is approved by the Ethical Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University. The approval is based on the documents sent by the researchers as requested in the form of the Ethics committee and filed under number 23-0676. The approval is valid through 26 June 2023. The approval of the Ethical Review Board concerns ethical aspects, as well as data management and privacy issues (including the GDPR). It should be noticed that any changes in the research design oblige a renewed review by the Ethical Review Board.

Yours sincerely,

Peter van der Heijden, Ph.D.
Chair
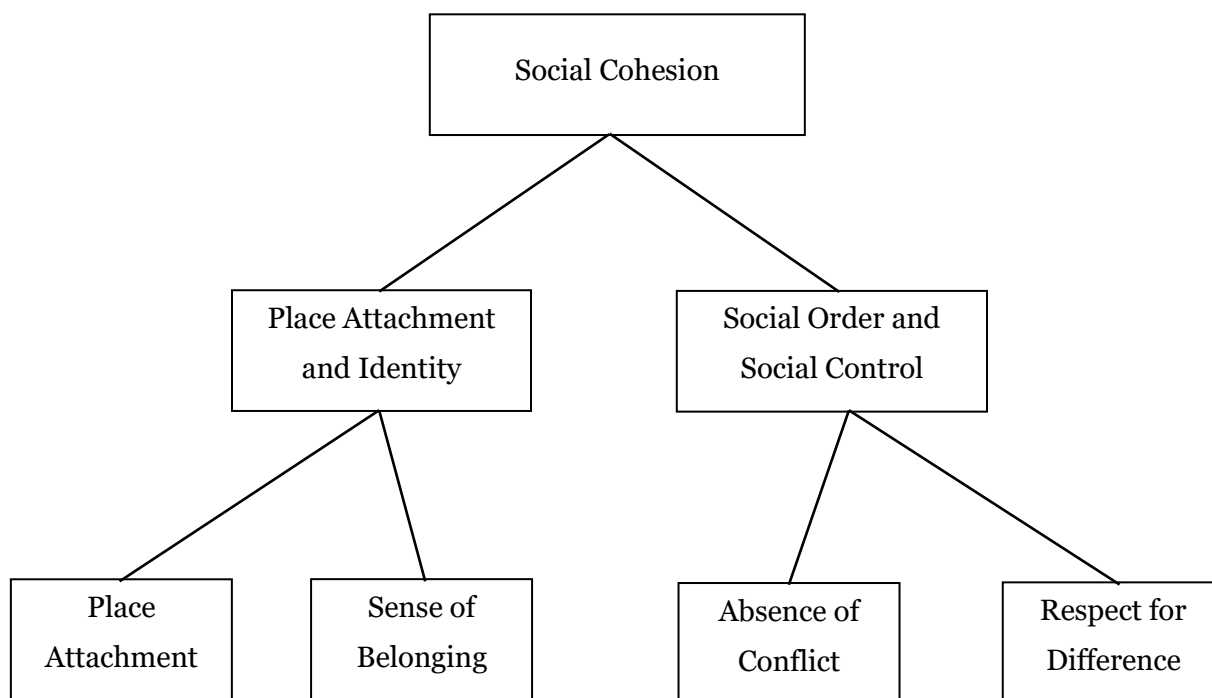This is an automatically generated document, therefore it is not signed

Appendix II

Two-by-two Framework of Chan et al. (2006)

	Attitudes	Behaviours
Cohesion within society	General trust with fellow citizens	Social participation and vibrancy of civil society
	Willingness to cooperate and help fellow citizens, including those from "other" social groups	Voluntarism and donations
		Presence of absence of major inter-group alliances or cleavages
	Sense of belonging or identity	
State-citizen cohesion	Trust in public figures	Political participation (e.g., voting, political parties, etc.)
	Confidence in political and other major social institutions	

Appendix III

Two Dimensions of Social Cohesion by Forrest and Kearns (2001)

```
                          ┌─────────────────┐
                          │ Social Cohesion │
                          └─────────────────┘
                          /                 \
          ┌──────────────────┐        ┌──────────────────┐
          │ Place Attachment │        │ Social Order and │
          │   and Identity   │        │  Social Control  │
          └──────────────────┘        └──────────────────┘
            /            \               /            \
    ┌──────────┐  ┌──────────┐   ┌──────────┐  ┌──────────┐
    │  Place   │  │ Sense of │   │Absence of│  │Respect for│
    │Attachment│  │Belonging │   │ Conflict │  │Difference │
    └──────────┘  └──────────┘   └──────────┘  └──────────┘
```
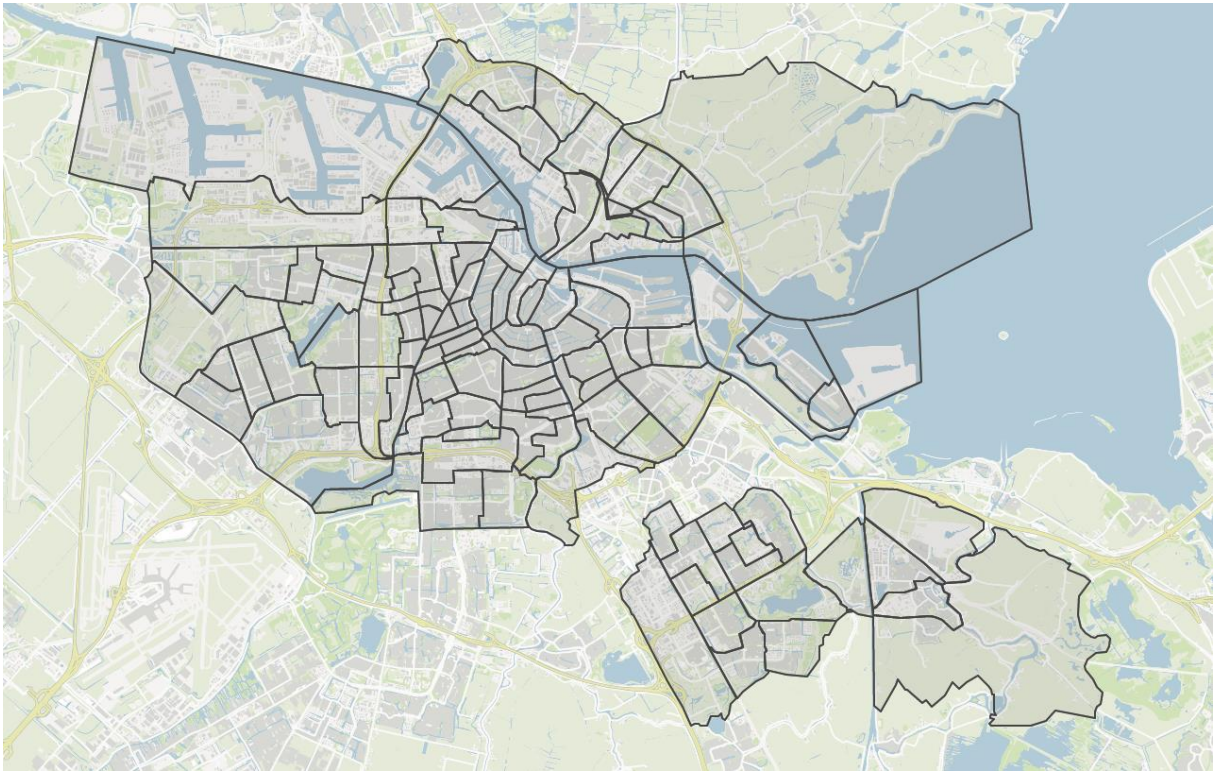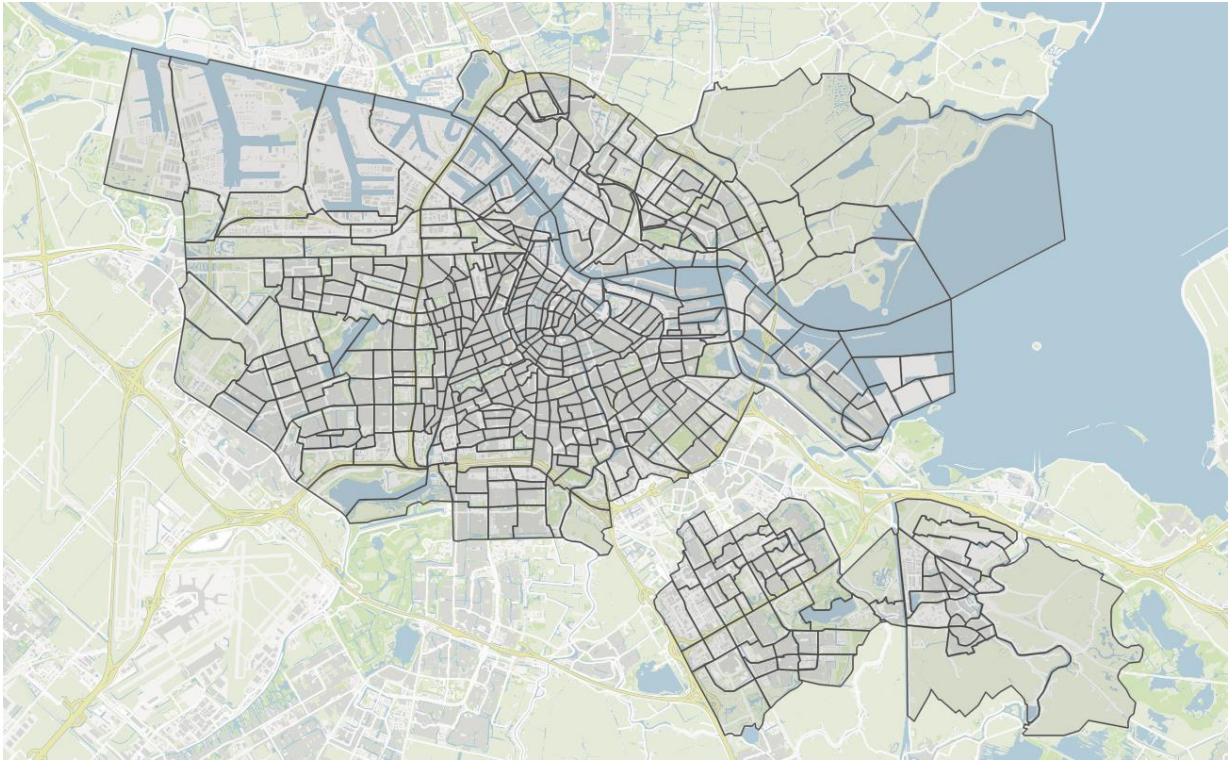
Appendix IV

Map of Amsterdam Filtered by District
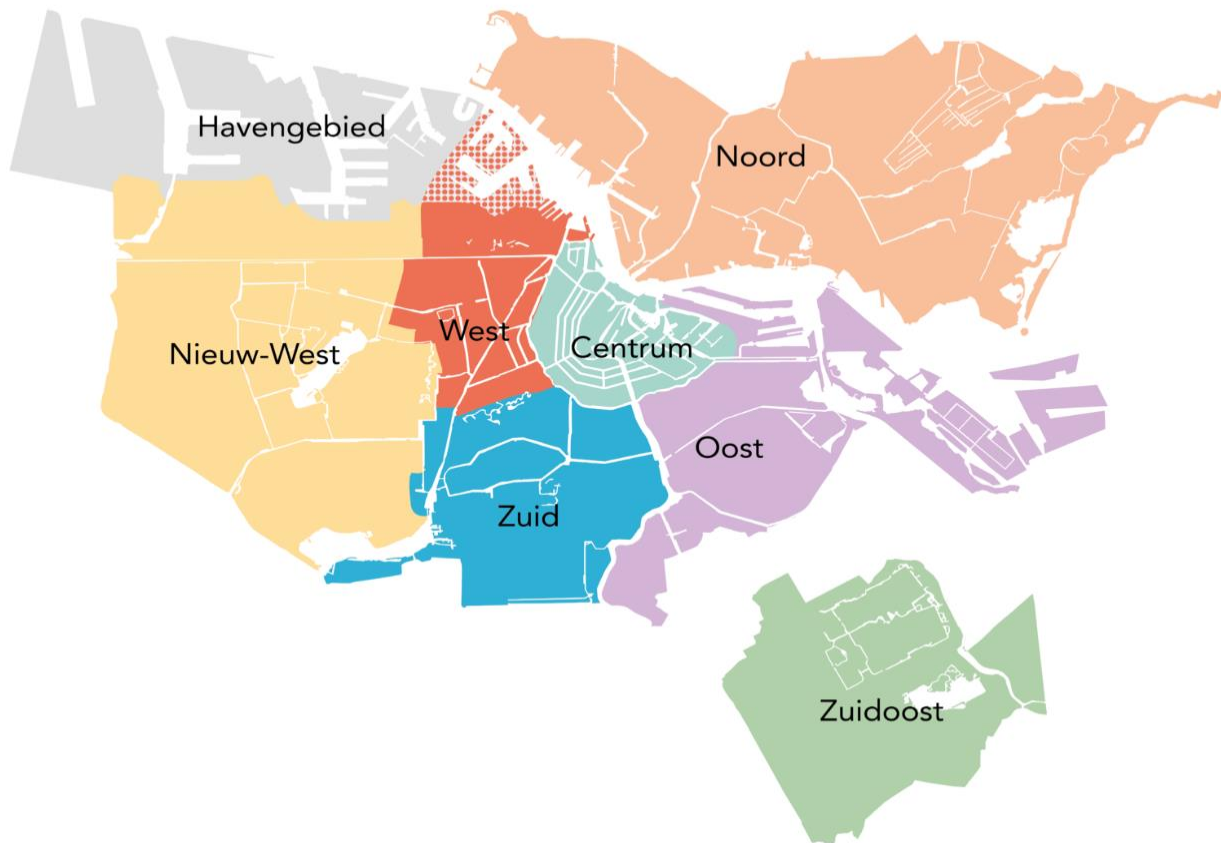
Appendix V

Map of Amsterdam Filtered by Neighbourhoods

Appendix VI

Map of Amsterdam Filtered by Communities

Appendix VII.

BBGA-questions Used for the Operationalisation of Neighbourhood Social Cohesion

Dimension	Question	Scale
Contact with fellow residents	To what degree are you in contact with your fellow neighbourhood residents?	1 = not at all 10 = very much
Residents help each other	Do people help each other in your neighbourhood?	1 = never 10 = very often
Involvement neighbours	How would you assess the degree of involvement of your neighbours in your neighbourhood?	1 = no involvement 10 = great involvement
Interaction between groups	How do the various groups of people in your neighbourhood interact with one another?	1 = very unpleasant 10 = very pleasant
Feeling at home	Do you feel at home in your neighbourhood?	1 = not at home at all 10 = very at home
Satisfaction with neighbourhood	How satisfied are you with your neighbourhood?	1 = negative 10 = positive

Appendix VIII

Social Infrastructure Examples from the BBGA

Public space	Examples	*N*
Cultural spaces	Museums, theatres, concert halls, and libraries	973
Hospitality venues	Restaurants, bars, and cafes	2372
Community centres	Community centres, youth centres, and senior centres	3025
Shopping facilities	Grocery stores, department stores, and specialty shops	4087
Healthcare facilities	Hospitals, clinics, and doctor's offices	1425
Public transport facilities	Bus stops, train stations, and ferry terminals	4085
Parking facilities	Parking garages, parking lots, on-street parking places	4032
School facilities	Elementary schools and primary schools	3752
Green spaces	Parks, gardens, forests, and other areas of open space	984
Playgrounds	Playgrounds and other areas where children play	3457
Sports facilities	Sports fields, gyms, and swimming pools	3949

Appendix IX

Socio-economic Status of Each District in Amsterdam (Privileged or Deprived) in 2020

District	MI	UR (%)	LEL (%)	AR (%)	SES
Centrum	50,500	7.1	7	15.1	Privileged
Zuid	53,900	6.9	9	14.2	Privileged
Oost	44,700	8.9	13	16.5	Privileged
West	40,500	11.0	19	18.5	Privileged
Nieuw-West	38,200	10.4	24	18.6	Moderately deprived
Noord	37,800	12.1	21	21.3	Moderately deprived
Zuid-Oost	36,000	13.2	28	20.8	Deprived

Note. Data was retrieved from the interactive website "Gebied in Beeld" (Research, Information, and Statistics Amsterdam, n.d.); MI = median income; UR = unemployment rate (%); LEL = low educational level (%); AR = assistance recipients (%).

Appendix X

Syntax used in regression analysis

DATASET ACTIVATE DataSet1.

FILTER OFF.

USE ALL.

SELECT IF (jaar <= 2022).

EXECUTE.

RELIABILITY

 /VARIABLES=LBUURT_R LTHUISVOELEN_R LBETROKKEN_R WCONTACTB_R WHELP_R
LOMGANGGROEPENB_R

 /SCALE('ALL VARIABLES') ALL

 /MODEL=ALPHA

 /STATISTICS=DESCRIPTIVE

 /SUMMARY=TOTAL.

COMPUTE Social_Cohesion=LBUURT_R + LTHUISVOELEN_R + LBETROKKEN_R + WCONTACTB_R +
WHELP_R +

   LOMGANGGROEPENB_R.

EXECUTE.

DESCRIPTIVES VARIABLES=Social_Cohesion

 /SAVE

 /STATISTICS=MEAN STDDEV MIN MAX.

DESCRIPTIVES VARIABLES=WZBUURTHUIZEN_R WZZORGVOORZIENINGEN_R OAANBODBAO_R
SRSPORTGELEGENHEDEN_R

   BHWINKELAANBOD_R BHHORECAAANBOD_R VKOV_R ORGROEN_R ORAANBODSPELEN_R
VKPARKEREN_R SRCULTVOORZ_R

 /STATISTICS=MEAN STDDEV MIN MAX.

RELIABILITY

 /VARIABLES=WZBUURTHUIZEN_R OAANBODBAO_R WZZORGVOORZIENINGEN_R
SRSPORTGELEGENHEDEN_R SRCULTVOORZ_R

   BHWINKELAANBOD_R BHHORECAAANBOD_R VKOV_R ORGROEN_R ORAANBODSPELEN_R
VKPARKEREN_R

 /SCALE('ALL VARIABLES') ALL

 /MODEL=ALPHA

```
/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.


COMPUTE Soc_Infra=WZBUURTHUIZEN_R + OAANBODBAO_R + WZZORGVOORZIENINGEN_R +
SRSPORTGELEGENHEDEN_R +

   BHWINKELAANBOD_R + BHHORECAAANBOD_R + VKOV_R + ORGROEN_R + ORAANBODSPELEN_R +
VKPARKEREN_R +

   SRCULTVOORZ_R.

EXECUTE.


FACTOR

/VARIABLES WZBUURTHUIZEN_R OAANBODBAO_R WZZORGVOORZIENINGEN_R
SRSPORTGELEGENHEDEN_R

   BHWINKELAANBOD_R BHHORECAAANBOD_R VKOV_R ORGROEN_R ORAANBODSPELEN_R
VKPARKEREN_R SRCULTVOORZ_R

/MISSING LISTWISE

/ANALYSIS WZBUURTHUIZEN_R OAANBODBAO_R WZZORGVOORZIENINGEN_R
SRSPORTGELEGENHEDEN_R

   BHWINKELAANBOD_R BHHORECAAANBOD_R VKOV_R ORGROEN_R ORAANBODSPELEN_R
VKPARKEREN_R SRCULTVOORZ_R

/PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION

/PLOT EIGEN

/CRITERIA MINEIGEN(1) ITERATE(25)

/EXTRACTION PC

/CRITERIA ITERATE(25) DELTA(0)

/ROTATION OBLIMIN

/METHOD=CORRELATION.


RELIABILITY

/VARIABLES=WZBUURTHUIZEN_R OAANBODBAO_R WZZORGVOORZIENINGEN_R SRCULTVOORZ_R
BHWINKELAANBOD_R

BHHORECAAANBOD_R VKOV_R

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.


COMPUTE Soc_Eco_Spaces=WZBUURTHUIZEN_R + OAANBODBAO_R + WZZORGVOORZIENINGEN_R +
BHWINKELAANBOD_R +

BHHORECAAANBOD_R + VKOV_R + SRCULTVOORZ_R.
```

```
EXECUTE.


RELIABILITY
 /VARIABLES=SRSPORTGELEGENHEDEN_R ORGROEN_R ORAANBODSPELEN_R VKPARKEREN_R
 /SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA
 /STATISTICS=DESCRIPTIVE
 /SUMMARY=TOTAL.


COMPUTE Recr_Spaces= ORGROEN_R + ORAANBODSPELEN_R + SRSPORTGELEGENHEDEN_R
EXECUTE.


DESCRIPTIVES VARIABLES=Soc_Eco_Spaces Recr_Spaces OAANBODBAO_R
 /SAVE
 /STATISTICS=MEAN STDDEV MIN MAX.


COMPUTE District_SocEcoSpaces=Priv_Depr * ZSoc_Eco_Spaces.
EXECUTE.
COMPUTE District_RecrSpaces=Priv_Depr * ZRecr_Spaces.
EXECUTE.
COMPUTE District_RecrSpaces=Priv_Depr * ZOAANBODBAO_R.
EXECUTE.


RECODE District (1=SYSMIS) (2=0) (3=1) (5=1) (4=SYSMIS) (6=2) (7=3) (8=4) (9=5) (10=6) (11=3)
   (12=6) (13=5) (14=SYSMIS) (15=7) (16=SYSMIS) (17=2) (18=SYSMIS) (19=SYSMIS) (20=4) (21=7) INTO
   District_new.
EXECUTE.


RECODE District_new (0=SYSMIS) (ELSE=Copy) INTO Stadsdeel.
EXECUTE.


RECODE Stadsdeel (1=0) (2=0) (4=0) (5=0) (ELSE=1) INTO Priv_Depr.
EXECUTE.


COMPUTE cultural_composition = (BEVNW_P >= 25).
   EXECUTE.
```

```
DESCRIPTIVES VARIABLES=cultural_composition
 /SAVE
 /STATISTICS=MEAN STDDEV MIN MAX.


RECODE VCRIMINALITEIT_R (3.9=8.5) (8.5=3.9) (4.1=8.3) (8.3=4.1) (4.2=8.2) (8.2=4.2) (4.3=8.1)
  (8.1=4.3) (4.4=8) (8=4.4) (4.5=7.9) (7.9=4.5) (4.6=7.8) (7.8=4.6) (4.7=7.7) (7.7=4.7) (4.8=7.6)
  (7.6=4.8) (4.9=7.5) (7.5=4.9) (5=7.4) (7.4=5) (5.1=7.3) (7.3=5.1) (5.2=7.2) (7.2=5.2) (5.3=7.1)
  (7.1=5.3) (5.4=7) (7=5.4) (5.5=6.9) (6.9=5.5) (5.6=6.8) (6.8=5.6) (5.7=6.7) (6.7=5.7) (5.8=6.6)
  (6.6=5.8) (5.9=6.5) (6.5=5.9) (6=6.4) (6.4=6) (6.1=6.3) (6.3=6.1) (6.2=6.2) INTO Perc_Crim.
EXECUTE.


DESCRIPTIVES VARIABLES=Perc_Crim
 /SAVE
 /STATISTICS=MEAN STDDEV MIN MAX.


COMPUTE household_composition2 = (BEVEENOUDERHH_P >= 10).
   EXECUTE.


DESCRIPTIVES VARIABLES=Social_Cohesion Soc_Eco_Spaces Recr_Spaces OAANBODBAO_R Priv_Depr
BEVNW_P
   BEVNW BEVEENOUDERHH BEVEENOUDERHH_P
 /STATISTICS=MEAN STDDEV RANGE MIN MAX.


MEANS TABLES=SRCULTVOORZ_R BHHORECAAANBOD_R WZBUURTHUIZEN_R

BHWINKELAANBOD_R WZZORGVOORZIENINGEN_R VKOV_R OAANBODBAO_R ORGROEN_R

ORAANBODSPELEN_R SRSPORTGELEGENHEDEN_R BY Centrum West NieuwWest Zuid Oost Noord

ZuidOost BY jaar

/CELLS=MEAN COUNT STDDEV.

REGRESSION
 /DESCRIPTIVES MEAN STDDEV CORR SIG N
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL CHANGE
 /CRITERIA=PIN(.05) POUT(.10)
 /NOORIGIN
 /DEPENDENT ZSco01
```

/METHOD=ENTER ZSoc_Eco_Spaces ZRecr_Spaces ZOAANBODBAO_R Priv_Depr Zcultural_composition
 ZPerc_Crim

/METHOD=ENTER District_SocEcoSpaces District_RecrSpaces District_SchoolFacilities

/SCATTERPLOT=(*ZRESID ,*ZPRED)

/RESIDUALS HISTOGRAM(ZRESID).