

**Scottish adolescents and urban open spaces:
An exploratory study of usage, availability, and
impact on subjective health and wellbeing.**

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Abstract

Adolescent use of urban open spaces has received little attention in Scotland from policy makers and researchers alike. This is despite the subject aligning with several national priority areas in the fields of education, planning, and public health. Little is currently known about the types of open spaces that adolescents choose to use, how and why they use them, and how they make them feel. There is also a knowledge gap relating to how open spaces are distributed within Scottish urban areas and whether this varies along socioeconomic lines.

To address this gap, this study used an exploratory sequential mixed methods research design, the findings of which were analysed through univariate statistics, multivariate statistics, a reflexive inductive thematic analysis, and a geospatial analysis. Through working with 594 adolescents aged 12 to 15, this thesis describes the characteristics and activities associated with adolescent visits to open spaces and the extent to which these visits are associated with subjective wellbeing. It also describes the spatial distribution of public parks & gardens, play spaces, sports areas, and civic spaces across the study area.

The findings demonstrate that adolescent engagement with open spaces is more varied than what the literature base suggests. Open spaces were most commonly associated with health and wellbeing outcomes associated with positive interpersonal relationships, suggesting that open spaces are important venues for fostering an adolescent's psychosocial development. The

geospatial analysis found an inequality in open space distribution, with the most deprived areas having the best availability of the open spaces of focus. In addition to this, a positive association was found between open space visits and health and wellbeing.

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Abbreviations and Definitions

CfE	Curriculum for Excellence
Es & Os	Experiences and Outcomes
GIRFEC	Getting it Right for Every Child
NPF4	National Performance Framework
PAN65	Planning Advice Note 65
SIMD	Scottish Index of Multiple Deprivation

Chapter One

Introduction

1.1 Introduction

This thesis explores the characteristics of adolescent visits to open spaces, the extent to which these visits are associated with subjective wellbeing, and whether the distribution of open spaces in Scottish urban areas is associated with spatial measures of relative deprivation. This study is timely and its focus reflects the current cultural and political context in Scotland by relating to concerns regarding the mental health of children and young people, the increasing use of open spaces as a health intervention, and a focus on local living in urban planning.

While these are seemingly distinct policy domains, the Scottish approach towards policy making frequently sees these areas as being under the influence of universal national policies created through iterative consultation processes with stakeholders (Cairney et al., 2016). However, this does not mean that authorities and stakeholders on a local, regional, and national level share common ways of working to achieve national outcomes. The sub-national governance model employed in Scotland results in a fractured landscape that makes cross-sector working a challenge (Clelland, 2020). This is because not all sectors work within common boundaries. For example, education provision is delivered by local authorities, of which there are 32 in Scotland. However, planning, which is also devolved locally, is the

responsibility of Scotland's 34 planning authorities (comprised of Scotland's 32 local authorities and two national park authorities). Thus, although it initially appears that there is consistency in how local affairs are governed, in reality there is divergence.

This phenomenon is also reflected in regional governance. For example, health is delivered through 14 Regional NHS Health Boards, but there are eight regional economic partnerships, 12 development regions, and six regional improvement collaboratives. Thus, cross-sector working can be difficult due to little overlap between these boundaries. By contributing findings that apply to the domains of education, planning, and public health, this thesis navigates this challenge. It intends to initiate a dialogue that crosses geographical, sectoral, and administrative borders for the benefit of adolescents in Scotland.

Very little is currently known about Scottish adolescent experiences with urban open spaces, despite resonating with areas of national interest. Adolescents are also rarely mentioned in policy regarding open spaces. Despite this, the presence of adolescents in open spaces is of interest to the general public. Although no formal study gauges public opinion on adolescent use of open spaces, a search of online interactions proves this to be a topic of contention:

"...they seem to be taking over all the best spaces and spoiling it for everyone else."

Comment made on a newspaper article reporting on teenagers' use of a Highland urban area, 6 Sep 2024.

“Get a place for kids to go. Best way to keep the kids out of bother.”

Comment made by a Facebook user on a post sharing
a new initiative to address anti-social behaviour in North
Lanarkshire Council, 17 Aug 2021.

These online comments present an interesting dichotomy between how adolescent use of open spaces is viewed publicly. The subject of adolescent use of open spaces is multifaceted and complex. For some, adolescents are seen as a social problem that needs to be solved. For others, the issue lies within a supposed lack of open space provision for adolescents, recognising that ‘anti-social behaviour’ occurs due to the needs of adolescents being disregarded by those in positions of power.

We do not have a research-informed understanding of what types of open spaces are predominantly used by adolescents in Scottish urban areas. We also do not know how or why adolescents use open spaces, nor the extent of open space provision for them. In addition, we do not know how open spaces make adolescents feel. This exploratory study aims to learn more about how adolescents use urban open spaces, thereby bridging a gap that allows the needs of adolescents to be reflected in policy and practice.

1.2 The broader context of this research

In the past ten years there has been a policy shift in Scotland, with the local environment becoming a site where various social, economic, and environmental challenges can be tackled. Legislatively, this shift is represented by the Community Empowerment (Scotland) Act 2015 and the Public Bodies

(Joint Working) (Scotland) Act 2013. These pieces of legislation were catalysts for the integration of local services, providing a legislative framework for community involvement in local resource management (Bynner, 2016). Those working in the public sector, such as teachers, health professionals, and urban planners, are increasingly required to be cognisant of the local environments that form the subjects and contexts of their work. With several public bodies expected to draw upon the same local environment as a resource, an opportunity exists for a high level of cross-sector collaboration.

A notable example of joined-up policy is Scotland's national framework for providing support for children and young people, known as *Getting it Right for Every Child* (GIRFEC) (Scottish Government, nd), which advocates for a collaborative cross-sector approach to supporting children and young people and achieving positive health and wellbeing outcomes. GIRFEC has been effective in creating a shared language to discuss the wellbeing of children and young people across sectors (Anderberg et al., 2025) and is an example of an integrated approach towards policy making (Coles et al., 2016). Nonetheless, serious difficulties with coordination continue to dog the steps of cross-sector working. Difficulties are further exacerbated by a preference for so-called 'plan-based policy'. This means that for some areas, instead of legislation, overarching national strategies or frameworks are developed by the Scottish Government to be enacted by a range of stakeholders in relation to their contexts. It is not uncommon for national action plans that promote increased partnership working to be written for the attention of a particular sector and to use their language of operation. One example of this is *Scotland's Learning for*

Sustainability Action Plan (Scottish Government, 2023c), which makes frequent mention of the need for community and partnership working to meet sustainability targets, even though it is written for and promoted to teachers. As such, it is easy for organisations to fall ‘out of step’ with what is expected of them or others on a national level.

In the following section, I portray the broader context of this thesis by briefly describing examples of where ‘the local’ has come to prominence and intersects in the fields of planning, public health, and education.

1.2.1 The 20-Minute Neighbourhood

In April 2024, the Scottish Government published *Living Local and 20 Minute Neighbourhoods: Planning Guidance* (Scottish Government, 2024b). This document outlines how social, economic, and environmental sustainability can be supported in communities through the effective implementation of ‘*The Place Principle*’, a policy stance adopted by the Scottish Government in 2019. *The Place Principle* sets out to promote ‘a shared understanding of place, and the need to take a more collaborative approach to a place’s services and assets to achieve better outcomes for people and communities’ (Scottish Government, 2019:np). This key policy supports targets set in Scotland’s current *National Performance Framework* (2025a:np) which ‘sets out a vision for collective wellbeing’. Thus, an understanding of place and how it is used is fundamental in improving outcomes for the people of Scotland and plays a role

in meeting national outcomes relating to health, communities, and the environment.

A focus on 'the local' has become a core element of Scottish planning policy, with concepts such as 'the 20-minute neighbourhood' taking prominence. The 20-minute neighbourhood concept is promoted as a mechanism that will, in time, improve the health and wellbeing of the Scottish population and break cycles of socioeconomic disadvantage. A 20-minute neighbourhood is an area where the facilities, services, and activities required for day-to-day life are located within an approximate 20-minute round walk from someone's home (Scottish Government, 2024b). The initiative has a strong spatial element, and effective implementation requires attention to be paid to the location and accessibility of specific features within a particular geospatial boundary. A successful 20-minute neighbourhood has core characteristics. Of these, a notable inclusion is the presence of high-quality green and grey open spaces that are easily accessible via active travel (Our Place, 2024a). Through this inclusion, open space in all its forms is recognised as part of the day-to-day life of the Scottish population and, because of this, is expected to be accessible to all.

This focus on local living is a relatively new policy position in Scotland (Sparks, 2021), and one reason for this current focus is derived from the COVID 19 pandemic. A sustained emphasis on staying local for the good of public health highlighted the value of well-serviced and well-connected neighbourhoods that were able to offer a relatively high quality of life during lockdown, particularly during the period where people were only permitted to be outdoors for one

hour a day (Chau et al., 2022). During this time, open spaces experienced increased usage (Deniz Kiraz & Ward Thompson, 2023) and played a role in supporting adolescent health and wellbeing. Stewart et al. (2023) found that 53% of their adolescent sample relied on open spaces to support their wellbeing during this time, with some believing that increased availability of these areas would have enhanced their wellbeing further. While open spaces are of value to adolescents, these findings suggest that there are perhaps too few to meet their wellbeing needs.

Few urban areas currently function as 20-minute neighbourhoods in Scotland (O’Gorman & Dillon-Robinson, 2021; City of Edinburgh Council, nd) with several key elements, such as open spaces, falling beyond required walking distances. Rectifying this is not simple. Žlender (2021) recommends that for sustainable planning to take place in urban areas, it is necessary not only to know more about what services or facilities already exist in an area, but also to know how the population uses them. Therefore, authorities need to be knowledgeable about the locations and distributions of open spaces within their jurisdiction, how various subsets of the population use these spaces, and to what extent they are accessible on foot before any urban renewal can take place.

Planning for the equitable distribution of open spaces, through association with the 20-minute neighbourhood concept, has met both political and material constraints. The concept is controversial and is negatively perceived by some who see it as a limitation on their freedom of movement and an infringement of their human rights (Marquet et al., 2025). Considering that local authorities

are political bodies, councillors may reject the concept to curry public favour. Conversely, the initiative has received strong political backing in one local authority with specific roles created to oversee its implementation (Richardson, 2025; Richardson & White, 2021). However, despite the current prominence of 'the local' in achieving national objectives, planning can be subordinate to other sectors in Scotland (Richardson & White, 2021), resulting in a lack of budget allocation in comparison to other areas of public spending. Due to the current financial insecurity of Scotland's local authorities, it is likely that any work to 'retrofit' communities to become 20-minute neighbourhoods will face challenges.

In times of austerity, it is not unusual for responsibility for the maintenance of open spaces to fall to communities (Holstead et al., 2018). However, in Scotland, official records of urban community landownership show this to be minimal (Chorley, 2019), indicating that any open space that is currently maintained by the general public is done so without legal recognition and without communities having formal authority to enhance local open spaces to best suit their needs. Therefore, despite policy intentions being highly supportive of the 20-minute neighbourhood concept and advocating for it to be used as a mechanism to support 'increased opportunities for people and communities to shape their own lives' (Scottish Government, 2024b:np), this does not easily translate to effective implementation for local authorities or communities.

Additional challenges exist, although these have yet to be explored in relation to the 20-minute neighbourhood concept. There is evidence that green space

provision is decreasing in Scotland. In their assessment of urban creep (the replacement of green spaces with impermeable surfaces such as concrete or tarmacadam) and urban expansion in Edinburgh, Rowland et al. (2019) found that the city lost an average of 0.11 km² of green space per year due to urban expansion and new residential developments. Similarly, Dickinson and Marson (2019) note that Scotland's green space provision has been eroded over time due to public land being sold to private developers. This may be due to a worrying absence of rigour in how open space is treated in local authority plans. In their analysis of green infrastructure provision in Scotland, Hislop et al. (2019) reported a high level of variation between local authorities. Some had no plans, some plans were incomplete, and many had weak and uncommitted wording about investment in and maintenance of green spaces. An updated search conducted for this thesis confirms that this is still the case. This suggests that green infrastructure provision, as an aspect of open space, is particularly vulnerable to austerity measures in the future should its value to the public not be effectively represented in local authority plans.

1.2.2 Green Health

The lack of plans to invest in green infrastructure on a local level is concerning and hinders development in other areas of policy and public service that draw upon local environments. For example, the application of green space as a health intervention is becoming increasingly mainstream in Scotland. This innovation aligns with the concept of 'green health', a term that refers to the use of outdoor activities in green spaces to support positive health and

wellbeing. This approach came to prominence when the Scottish Government commissioned NatureScot to establish a pilot 'natural health service' in 2015 (NatureScot, 2025). This service, through the establishment of four regional pilot green health partnerships, encourages Scotland's public health and social care sectors to prescribe nature-based interventions for the prevention, treatment, and care of illness where appropriate. Though research into the effectiveness of the 'natural health service' is limited, there are indications that green interventions have a positive impact. For example, Howlett et al. (2025) found that patients in receipt of 'green health prescriptions' i.e. where a health professional prescribed or recommended engagement with the outdoors to treat or manage a health condition, felt less anxious and depressed, and enjoyed higher levels of confidence. They also gained a newfound sense of community by engaging in interventions in their local area.

The initiative is also well-received by practitioners. Frost et al. (2025) found that two-thirds of their sample of Scottish general practitioners (GPs) were in favour of green health prescriptions for their patients. Although, they also expressed concerns. Most GPs were not confident in the ability of patients living in deprived areas to access the prescribed interventions taking place in parks and community gardens. This suggests that there may be a socioeconomic inequity in how open spaces can be used to support positive wellbeing. Health professionals also expressed concerns in Marx and Moore (2022) where some noted a lack of knowledge of the nature-based interventions available for them to prescribe, while others were concerned that their patients would not accept a nature-based intervention as a legitimate form

of care. These concerns suggest that increased awareness of open space and its benefits is not just important to urban planning. It is also of importance in regions where green health partnerships are in operation.

Despite best efforts, McHale et al. (2020) conclude that green health has yet to be fully embedded into core planning in the public health and social care sectors, with poor communication between the public health sector and intervention providers seen as one barrier to success (Marx & Moore, 2025). In addition to this, few providers keep records of those who have accessed their services, resulting in the overall impact of the initiative being largely unknown (McHale et al., 2020; Howlett et al., 2025). Therefore, it is difficult to determine whether specific cohorts, such as adolescents, have engaged with and benefited from green health initiatives. An understanding of whether adolescent health and wellbeing are affected by prescribed engagement with open spaces would be beneficial, especially once the current crisis in adolescent mental health is considered.

1.2.3 Adolescent Health and Wellbeing

Adolescent mental health and wellbeing are issues of global concern. Worldwide, it is estimated that one in seven adolescents experiences a mental disorder, with conditions associated with poor mental health such as anxiety and depression (conditions notably lessened by patients in receipt of green health interventions in Howlett et al., 2025) constituting for 15% of the total disease burden for this age group (World Health Organisation, 2024). The

negative consequences of experiencing poor mental health in adolescence are well-documented. Poor mental health in adolescence is linked with lower academic achievement (McLeod et al., 2012), lower school completion rates (Jystad et al., 2024), and a higher likelihood of experiencing poor mental health in adulthood (Naicker et al., 2013). High levels of poor mental health in adult populations have a high economic burden (Doran & Kinchin, 2017) and this makes mental health a particular area of interest for countries that aim to keep 'people out of poverty and contributing to economic success' such as Scotland (Scottish Government, 2025b:17).

In Scotland, adolescent mental health has been in decline for over twenty years (Inchley et al., 2023a), a decline exacerbated by the COVID 19 pandemic (McMellon & MacLachlan, 2021; Stewart et al., 2023). The impact of the pandemic is recognised in the national *Mental Health and Wellbeing Strategy* (Scottish Government, 2023a) which also confesses that 'the current system is not delivering as we would wish' (p. 15). While not made directly in relation to adolescent mental health and wellbeing services, this statement also applies to adolescents.

The mental health and wellbeing of adolescents is not solely a matter for public health in Scotland. As evidenced by the *Children and Young People Health and Wellbeing Joint Delivery Board*, a short life group established to oversee and support reform in mental health services for young people, responsibility also falls under the remit of education providers, community services, children's services, and employers (Scottish Government, nd). Notably urban planners are not included in this list despite their remit of creating

neighbourhoods that improve the health and wellbeing of the Scottish population, evidencing a splintered policy landscape.

While *Getting it Right for Every Child* (GIRFEC) advocates a holistic approach towards supporting the health and wellbeing of young people, there are crucial omissions relating to how different services could coordinate their efforts (Toma et al., 2022). As such, there is disagreement within sectors regarding whether their services should play a leading or assisting role in supporting the health and wellbeing of young people (Greig et al., 2019). Additionally, there are regional variations in service provision (Smith et al., 2018; Gilmour et al., 2022; van der Kamp, 2018). This means that the effectiveness of the service received by the 8,895 children and young people referred to the Child and Adolescent Mental Health Services (CAMHS) during the first quarter of 2025 (Public Health Scotland, 2025) is highly dependent on where in Scotland they live, the specialisms available in their area, and the capacity of various sectors to coordinate their provision.

Challenges in supporting adolescent health and wellbeing also have a personal dimension. Adolescents do not easily seek support when they have a mental health issue, tending to only do so if they are already aware of the existence of effective treatments available to them (Goodfellow et al., 2022). Adolescents are also more likely to seek help when they know of a consistent support figure who will take their views seriously (Meldahl et al., 2022). As such, Scottish secondary schools are increasingly becoming locations where adolescents can learn how to support their health and wellbeing and engage with trusted adults who can signpost them to relevant supports. This is

facilitated through the national curriculum and the current professional standards for teachers.

In Scotland, the current national curriculum, *Curriculum for Excellence* (CfE), considers health and wellbeing to be a cross-curricular area that is the responsibility of all practitioners. In the operational guidelines for teachers entitled *Health and Wellbeing across learning: Responsibilities of all: Experiences and Outcomes* (2009) a list of cross-level statements pertaining to *Mental and Emotional Wellbeing*, *Social Wellbeing*, *Physical Wellbeing* and *Relationships* (italicised here and throughout this thesis to signify reference to CfE rather than categories of wellbeing more generally) guide teachers in ensuring that 'children and young people develop the knowledge and understanding, skills, capabilities and attributes which they need for mental, emotional, social and physical wellbeing now and in the future' (2009:1). Teachers are required by the General Teaching Council for Scotland (GTCS) to value health and wellbeing as part of the curriculum and build positive and respectful relationships with young people (GTCS, 2021). In this sense, supporting adolescent health and wellbeing is intrinsically linked to the role of being a teacher in Scotland and teachers play a vital role in developing a resilient adult population.

To fulfil such expectations, teachers are required to have a certain level of knowledge of the local environments within their school catchment areas and the allied professions that work within them. The GTCS further expects teachers to develop partnerships beyond school boundaries (2021:7) that connect young people with the local natural environments within their

communities to support wellbeing (2021:9). This is supported by the national curriculum which sees learning outdoors as a pedagogical approach that sustains positive health and wellbeing (Education Scotland, 2010b). However, secondary school teachers are not always residents of the school catchments in which they work, and the current curriculum, which is skills-based, does not readily facilitate young people in engaging with knowledge creation activities about their local area that teachers can learn from (Quirke et al., 2024). There is a need, therefore, for teachers to collaborate with partners that support engagement with local open spaces to facilitate outdoor learning experiences that meet professional expectations regarding curriculum, pedagogy, and the health and wellbeing of adolescents.

1.2.4 Conclusion

The development of policy over the last decade has seen knowledge of local environments become an element of the work of teachers, planners, and health professionals. Despite parallels, it is apparent that the importance of place in these fields has developed in isolation, with little integration or cross-sector working. However, there is a shared aspiration to know more about open spaces and how they are used to improve health and wellbeing outcomes. This thesis is an initial step in fulfilling this aspiration.

1.3 Research Aims and Research Questions

The main objective of this study is to identify the types of open spaces used by adolescents in urban areas in Scotland and to identify the extent to which adolescents recognise open space as a factor that supports them in achieving positive health and wellbeing outcomes. In addition to this, this study seeks to identify the distribution of open spaces used by adolescents across urban areas in Scotland, and to explore whether any inequalities in distribution align with spatial measures of relative deprivation.

This study aims to answer the following research questions:

1. What are the activities and characteristics associated with the types of open space visited by adolescents aged 12 to 15?
2. Is visiting open space associated with adolescents' subjective wellbeing?
3. What are the spatial distribution patterns of the types of open spaces used by adolescents within the boundaries of Scottish urban units?
4. Are the spatial distribution patterns of open spaces used by adolescents within the boundaries of Scottish urban units associated with area-based measures of relative deprivation?

1.4 Thesis Structure

This introductory chapter is followed by seven others:

Chapter Two outlines the theoretical frameworks that influenced my thinking during this thesis. This includes Erikson's theory of psychosocial development

(1950), Lefebvre's 'Right to the City' (1996), Bronfenbrenner's ecological systems theory (1979), and a children's geographies-informed understanding of place.

The literature review of this thesis forms Chapter Three. In this chapter, I define open space in the Scottish context and explore what is currently known about how adolescents use open spaces, the place of open spaces in supporting wellbeing, and how the availability of open spaces may vary for particular groups in society. Following an exploration of the place of adolescents in Scottish open space policy, the gap in the literature that informed this study's research aims and questions is affirmed.

In Chapter Four, I outline the methodological approach used for this study, which was an exploratory sequential mixed methods design informed by a post-positivist paradigm. The findings from each stage of the study follow. In Chapter Five, I share findings pertaining to Research Question 1. In Chapter Six, I share findings pertaining to Research Question 2. In Chapter Seven, I share findings pertaining to Research Questions 3 and 4.

Chapter Eight features the discussion and conclusion of this thesis. A series of recommendations relating to research, policy and practice is made. A reflection upon the strengths and limitations of this study follows this. Finally, a reflection upon how completing an EdD has supported me in meeting the descriptors of Level 3 of the *Vitae Research Development Framework* (Vitae, 2025) concludes this chapter.

Chapter Two

Theoretical Frameworks

2.1 Introduction

In this chapter, I outline the theoretical frameworks that have guided my thinking and decision-making throughout this study. In the previous chapter, it was made clear that this study is multidisciplinary. Therefore, it is necessary to share my theoretical understanding of the key concepts of 'adolescence', 'the urban', 'place', and 'environmental influence' from the outset so that my interpretations are clear. First, this chapter illustrates the societal position of adolescents by drawing upon the work of Erikson (1950). Then, I explore Lefebvre's *Right to the City* (1996) to understand the role of open space in urban settings. The subsequent section examines adolescent experiences with open space through the lens of children's geographies. Then, an application of Bronfenbrenner's *Ecological Systems Theory* (1979) as a framework that contextualises the various elements of my study in relation to each other and supports an understanding of how different levels of environmental systems influence adolescents is described.

2.2 A theoretical understanding of adolescence

Developing a theoretical understanding of the social position of adolescence is important in contextualising this study. Adolescence is commonly seen as a

transitional stage between childhood and adulthood marked by distinct developmental needs. It is a period of development that is characterised by reward-seeking, risk-taking, and independence-seeking behaviours (Casey et al., 2008). During this life stage, individuals experience several biological, cognitive, and social changes. As a result, society often perceives adolescents as biologically unstable beings that require adult control (Lesko, 1996). These perceptions influence policy and practice relating to adolescent engagement with society.

One of the foundational theories that informs our understanding of adolescent development is Erik Erikson's theory of psychosocial development. First introduced in *Childhood and Society* (1950), Erikson subdivides the life course into eight stages. Each developmental stage is defined by a crisis to be resolved by the individual to progress onto the next stage. The stage associated with adolescence, stage five, is characterised by a crisis of identity vs role confusion. During this stage, the adolescent begins to form ideas of who they are and how they fit into society. While still widely used to support an understanding of psychosocial development (Archer de Carvalho & Henriques Veiga, 2022), Erikson's work has been critiqued for oversimplifying human development, neglecting the influence of sub-identities, and for prioritising masculine identities (Benson & Bundick, 2015). Nonetheless, its ubiquity has greatly influenced how adolescents are perceived and treated by many in decision-making positions, making an understanding of its principles highly valuable when considering how and why adolescents use open space.

A core characterisation of adolescence is that the individual begins to seek out a sense of belonging. Peer relationships become important in facilitating this as they allow for the adolescent to explore and affirm a sense of self (Batra, 2013). Relationships with peers are symbiotic and are shaped by a process of mutual recognition (Kroger, 2006) where the adolescent is influenced by their peer group and plays a role in influencing peers in return. This process fosters feelings of belonging, security, and self-confidence as the group recognises the adolescent, and indeed recognises themselves, as a valued contributor (Rageliene, 2016). As such, peer relationships play an essential role in resolving the crisis of adolescence. By doing so, these relationships support psychosocial development into adulthood (Benson & Bundick, 2015).

This process of mutual recognition is replicated by broader society. The adolescent has a desire to feel a part of and be validated by their wider community. The adolescent is shaped by societal expectations, hoping to have their autonomous voice heard by society in return. However, this process is not always actualised. Adolescents can be denied recognition and inclusion by society, often due to the labels attributed to them as a group. Because adolescents are peer-oriented, they are prone to gathering in large groups in open spaces. These groups of adolescents appear as threatening, disruptive, and antisocial to adults (Valentine, 2013). This, combined with their assumed biological and psychological instability, makes it common for adolescents not to always be trusted to participate in decision-making processes that have an impact on themselves and others.

In instances such as these, adolescents may feel rejected and marginalised by society due to their high social sensitivity (Somerville, 2013). Still seeking a sense of belonging, adolescents are then likely to engage with subcultures or align themselves with dissenting groups, which, in turn, further solidifies their status as a threat to others. Erikson acknowledges this process, identifying that adolescent 'delinquents' are created by the societies that reject them (Erikson & Erikson, 1957) and engage in dissenting behaviours as a response to social rejection (Erikson, 1970). In this sense, adolescents are socially constructed as a group that needs to be managed and controlled for the good of themselves and others. Their presence in open spaces where they don't belong is taken as an offence that requires intervention to protect the safety of others. In essence, adolescents are reduced to a series of stereotypes that institutions of power define as inherently problematic (Lesko, 2012).

To conclude, it is challenging to describe adolescence as a singular 'thing'. While it is a stage with generally agreed-upon biological and psychological markers, it is also a stage that is socially constructed. Current societal perceptions of adolescents as unstable beings who are inherently threatening lead to their exclusion from decision-making processes and exclusion from the open spaces they may use for peer interaction. This undermines the mutual recognition necessary for a healthy transition into adulthood. Due to their status in society, the extent to which adolescents have power over their local environments is limited, and how adolescents use open spaces may be highly controlled by adults in various positions of power. This thesis applies this

perspective when exploring the mobilities of adolescents within these confines.

2.3 A theoretical understanding of open spaces and urban areas

Urban open spaces are frequently used by adolescents as site for social interaction. Features found in open spaces, such as playground equipment in play spaces or concrete steps in a park, afford locations for adolescents to 'hang out' despite this not being their intended function. Some adults may see this use as subversive, making adolescents an unwelcome presence in open spaces. In cases like this, urban open spaces are perceived as places where adolescents do not belong. This makes me question: who are open spaces intended for, and what role are open spaces expected to play in urban areas?

My understanding of the role that open spaces play in urban areas is informed by Henri Lefebvre's 'Right to the City' (1996). The Right to the City is a concept that advocates for socially just urban spaces that are shaped by the needs of urban inhabitants. Despite its name, the concept is not limited to understanding 'the city' in a physical sense (Marcuse, 2014). The term 'the city' also encompasses urban society and the forces or people that shape the city such as local authorities. Drawing upon planetary urbanism (Huang & Huang, 2024), a framework that views city processes as extending well beyond city limits, the principles of the Right to the City can be applied to urban areas of all shapes and sizes, making it highly applicable for this thesis.

The Right to the City upholds that urban areas should be a product of the inhabitants who live in them. Lefebvre argues that, historically, urban areas have been shaped and reshaped by social processes driven by the needs of their inhabitants (1996). Following industrialisation, urban areas instead became associated with, and shaped by, the processes of capitalism. This is characterised by the commodification of space and the division of urban areas into districts or zones based on economic interests (e.g. the building of residential areas close to a place of work). Although many global economies are entering an era of deindustrialisation, urban areas are still shaped by capitalism to a significant degree. Urban areas are often viewed as commercial systems, and the distribution of services or features in urban areas, such as shopping centres, supermarkets, and newsagents, is often in relation to the amount of commercial market they control. This understanding of service provision is known as central place theory. The Right to the City, as a concept, advocates that urban areas can be, and should be, shaped by the needs of their inhabitants once again (Demirbas, 2022). However, there is a significant barrier to this taking place, which is the private ownership and commodification of urban space.

Lefebvre observes that the rights of property owners supersede the rights of urban dwellers that do not own property. While Marcuse (2014) identifies six different readings of the Right to the City, Purcell (2014:142) notes that all applications reiterate that the Right to the City is principally about 'a struggle to augment the rights of urban inhabitants against the rights of property owners'. Property owners hold power in urban areas due to their possession

of space. Capitalism commodifies urban space, transforming it into 'land' or 'property' that can be bought, sold, and subdivided. Once urban space becomes private property, it becomes severed from the rest of the city as the property owner can limit or restrict public access. Property owners prioritise the land they own and often disregard the broader social or environmental impacts of any development that takes place.

Contemporary urban planning practices often reinforce privatisation in the face of public sector austerity measures (Richardson & White, 2021). One example of this is through the process of zoning. Zoning refers to the act of dividing urban areas into parcels and assigning them a certain land use e.g. residential use or commercial use. Each zone has its own set of regulations dictating what type of development can take place there e.g. the style of buildings, the density of buildings, infrastructure requirements, etc. By zoning urban space, local authorities exclude urban inhabitants from participating in the processes that shape their environments (Purcell, 2014). It also actively segregates urban inhabitants into areas designated for residential use. The quality of life in these residential areas is often influenced by decisions made by the landowner (whether they be private developers, local authorities, or other bodies) rather than the inhabitants themselves.

The Right to the City, as a framework, advocates for two key principles (Demirbas, 2022). The first is the right to participation. This calls for urban inhabitants to be actively involved in the production and transformation of urban space, challenging the concentration of power held by authorities and private owners (Friendly, 2012). The second is the right to appropriation. This

right envisages urban space as a public good that belongs to all inhabitants, rejecting the notion that urban space can be privately owned. The role of open space in urban areas can be understood through these principles. In the case of spaces such as Public Parks & Gardens, Play Space, and Civic Space (intentionally capitalised here and throughout this thesis to specifically refer to the definitions of these spaces as per *Planning Advice Note 65* (2008) which is Scottish Government planning guidance on the creation and enhancement of open spaces), open spaces function as a public resource where urban inhabitants can meet, interact, socialise, and participate in cultural, recreational, and political activities. In doing so, they support the development of civic identity, i.e. an understanding of their role and responsibilities as a member of their community, and enable the right to participation.

However, while open spaces support the right to appropriation, the extent to which they support participation is limited. Local authorities manage open spaces, and the extent to which the voices of urban inhabitants are heard is highly dependent on whether or not the local authority prioritises public engagement. Even in cases where participation is encouraged, acting upon the wishes of inhabitants is often dependent on the availability of funding. In a Scottish context, local authority funding and spending are of national concern with many local authorities scaling back on public service provision and infrastructure maintenance to balance budgets (COSLA, nd). The need for local authorities to engage in consultation exercises is reduced as fewer new projects are commissioned. By extension, this limits a local authority's ability to support the right to participate.

In contrast, open spaces such as private parks and gardens, sports areas, and allotments can be privately owned or have restricted access. These spaces are not intended for unrestricted use by the public and therefore deny the right to appropriation. However, those who are 'members' of these open spaces can participate in the decision-making process, such as by joining committees, to shape these spaces to meet the needs of their members. This creates open spaces where the right to participation is afforded, albeit only to those who can afford membership fees and possess sufficient social capital to secure committee positions.

Thus, I see urban areas as a setting where the conflict between urban inhabitants, property owners, and decision makers is well defined but contextual, and this informs how specific open spaces are used, shaped, and experienced by urban populations. Depending on the type of open space, different rights to the city are afforded to inhabitants. Drawing upon the previous section, urban adolescents can be particularly affected by this struggle. Their attempts to appropriate open spaces are perceived as threatening and anti-social by other urban inhabitants. They also do not typically have the independent financial means to access or participate in others. As such, adolescents are denied the right to the city and, in turn, denied opportunities to build confident identities through appropriation and a sense of belonging through participation. As a result, their relationship with urban open space is especially precarious.

2.4 A theoretical understanding of adolescent experiences of place

Considering the precarity faced by adolescents when exercising their right to the city and the importance invested in 'place' in national policy in Scotland, this study required a theoretical understanding of place and how place is experienced by adolescents. My understanding of these concepts is informed by a children's geographies approach. Children's geographies is a sub-discipline of human geography that involves researching the environments that shape children and young people's lives. Literature in this field is multifaceted, with the sub-discipline making contributions to the areas of play, public space, mobility, marginalisation, wellbeing, and participation, amongst others (Freeman, 2018). As such, it is a field that is highly varied. However, Yarwood and Tyrrell (2012) state that this literature, while seemingly disparate, shares a common fundamental understanding that children and adults experience the world in different ways. This understanding is also core to this thesis, where it informs the belief that adolescents and adults experience open spaces in different ways, making research focused on adult use of open space insufficient in understanding the adolescent experience.

Children's geographers believe that adolescents are capable of being social actors. This means that they can shape and change their own spatial experiences. However, it is recognised that this agency is restrained due to limits placed upon adolescents by adults in power. This forms a basis for the different ways that adolescents and adults experience places. The spatial environments (in the case of this study, open spaces) that adolescents interact

with are greatly influenced by decisions, events, and activities that are instigated by the policies drafted and enacted by adults (Ansell, 2009). The realm of the policymaker is one that adolescents traditionally have little ability to influence or access. Due to this, the field focuses on understanding how children and young people experience and interpret place within these confines created by adults.

To gain this understanding, the field favours child-centred participatory methods that aim to conduct research *with* children rather than *about* children. While recognised for using innovative methods that promote children's agency (Kesby, 2007), it is notable that the field is not always successful in applying these methods to achieve this outcome. For example, drawing upon the Lundy model of participation (2007) in their evaluation of photo-stories created by children in England and Wales, Karlidag-Dennis et al. (2025) identified several instances where the ability of children to participate in the research process was compromised. It is important to note that this is not due to failings of the research team. Rather, these instances occurred due to the structures in which the research was conducted.

Safeguarding concerns restricted how children were identified in the research, preventing them from using self-chosen pseudonyms. Organisations of which the children were a part acted as mediators between the children and the researchers, limiting the children's ability to directly engage with researchers and ask questions. Children also had limited input in how their data was disseminated, limiting their contact with policymakers and stakeholders. From this example, it is unfortunately apparent that the use of participatory methods

does not necessarily equate to outcomes that are equally useful to children, researchers, and policymakers.

The role of children's geographies in informing policy is debated. Horton and Kraftl (2005) argue that, for children's geographies to be useful, it does not necessarily need to be policy relevant. Simply knowing more about the worlds of children is worthwhile in itself. However, Freeman (2018:119) identifies that the field has 'not really' been successful in instigating change that has improved the lives of young people. There are many reasons why this might be the case. Punch (2016) identifies that the field is multi-disciplinary rather than trans-disciplinary, resulting in a lack of dialogue between disciplines that can identify issues common across academic disciplines or professional sectors. I recognise that this dynamic is reflected in the challenges to cross-sector working in Scotland.

The knowledge generated through children's geographies has had little crossover into practice. This has been noted in urban planning. Cele and van der Burgt (2015) identify that some planners in Sweden, who have been operating under the expectation that the UN Conventions on the Rights of the Child should be reflected in the actions of local authorities since 1999, have prejudiced notions of children's needs and were not sure how to support children's participation in the planning process, questioning the competencies of children in this area. This means that whilst children's rights were supposedly embedded in policymaking, the right to participate was not connected to the planning process, ignoring one of the four general principles of the UNCRC.

There are a number of prevailing ‘myths’ that pose barriers to young people’s participation in local planning processes. These include perceptions that young people are difficult to reach, not interested in their local area, and that professional judgement can adequately determine the needs of young people (Strachan, 2024). However, young people are not only capable of understanding the needs of their communities but also are aware of the wider contexts that shape decisions about the places in which they live and how this leads to their local areas changing over time (Strachan, 2018). In addition to this, young people have been known to demonstrate a sense of care and responsibility for their local areas and prioritise the needs of the community over their own interests (Strachan, 2024). As such, young people can be considered as experts in their own neighbourhoods on a par with adults and are capable of participating in the decision-making process despite these myths.

These capabilities do not necessarily mean that young people should be treated exactly like adults when engaging them in the planning process. Doing so would arguably deny, or reduce the appreciation of, the distinct contexts of childhood that inform their experiences and views of the places in which they live. Often when young people are formally invited to participate in the planning process, it typically takes place in spaces that are abstracted from their everyday lives (Percy-Smith, 2015), such as in offices or central headquarters, where the traditional adult-led decision-making process can dull opportunities for young people to articulate their views. This is particularly the case when the

invitation is to participate in advisory groups with the purpose of commenting on decisions that have already been made.

Strachan (2023) recognises that these current systems are problematic and argues that a bespoke approach is essential to engage young people in traditionally adult focused planning processes. Percy-Smith and Burns (2013) support this by advocating for the creation of environments that are not fully controlled by adults or defined by adult agendas but instead allow young people to act (participate rather than be consulted) on issues they care about. However, in order for these routes for participation to be successful and sustained they require funding, commitment from adult stakeholders, and commitment from participants (Percy-Smith, 2021). The quality of the relationship between young people and adults also plays an important role in fostering a climate where effective participation is possible (Percy-Smith, 2015). Therefore, meaningful participation in the planning process requires work to dismantle the myths described by Strachan (2024) and depends on opportunities to engage in inclusive spaces and form trust-based relationships between young people and adults. Doing so provides a better chance for shared decision-making to occur. While no study has been conducted, similar barriers to participation may be present in Scotland.

In *Unlocking the Value of Scotland's Data* (Scottish Government, 2023i) it is noted that public engagement exercises that use a consultation approach are sometimes favoured over more active approaches to participation. This suggests that highly participatory approaches that involve participants in the data gathering process to inform public policy are non-standard in Scotland.

This is because of contested views held by the public sector on who should be involved and how, and a feeling that individual views do not equate to a singular public perspective. In addition to this, a lack of sufficiently large sample sizes in some data gathering exercises is lamented (Scottish Government, 2024a), suggesting that public policy in Scotland is unlikely to be informed by small scale phenomenological studies often associated with a children's geographies methodology. However, despite these practical concerns, I argue that there is a strong theoretical justification for understanding how children and young people experience place. This will now be discussed.

According to children's geographers, place is socially constructed. A place is more than just a geographical location. It has an associated symbolism that can be understood in a personal or shared capacity and can be influenced by social and cultural factors. This view is influenced by the '*Spatial Turn*' in the 1980s where space, place, and the construction of identity became an area of focus in the social sciences (Grgas, 2012) and the '*Cultural Turn*' in the 1990's which saw a movement away from geography being a discipline purely focused on topography and landscapes and a movement towards gaining an understanding of the connections between human cultural and spatial arrangements (Kraftl, 2019). With these ideas in mind, how children and young people understand place and develop a 'sense of place' emerges as an important concept in children's geographies.

Kyle and Chick (2007) define 'sense of place' to mean an individual's relationship with place, which is grounded through memory, experience, social

relations, and familiarity with the physical attributes of a place. It is these attributes that create a space's subjective, authentic character (Jive & Larkham, 2003). Different types of places evoke different feelings. Seamon and Sower's (2008) reading of Relph (1976) discusses the concepts of 'insideness' and 'outsideness'. These concepts are used to categorise the feelings attributed to places, but do not refer to physically being inside or outside a location as the phrases may suggest. Instead, they refer to how emotionally close an individual feels towards a place. To be 'inside' a place is to experience feelings of safety, ease, and belonging whereas to be 'outside' a place is to feel detached from a place and to feel that you do not belong. How someone feels about a place is dictated to a certain extent by whether they experienced it as an insider or an outsider. As such, the same place can evoke different feelings in different people, suggesting that adolescents can experience place differently from adults.

While one's characteristics such as age, sex, or race may influence whether place is experienced as an insider or an outsider (see Main's (2013) study of immigrant experiences in public parks as one example) it is also possible for people of sharing characteristics to experience place differently because of their individual lived experiences. An example can be shown by two parents visiting a play space with their child. The experience might make one adult feel content as they associate this type of space with a happy childhood. In contrast, the other might feel uneasy as they were bullied in a play space as a child. This highlights the highly subjective and personal nature of experiences

of place, making it difficult for an objective outsider to understand children's experiences without direct engagement.

The subjective and emotional connections that people have with places are also explored by Tuan (1979). Tuan distinguishes between two types of places created and experienced by humans, with each evoking differing emotions. The first are 'public symbols', such as public squares and sacred places, which are intentionally designed to be highly visible and signify an importance that is mutually understood. 'Fields of care', the second type of place, inspire feelings of affection and include places such as local parks or an individual's home. They need to be known intimately, and this can only be achieved by regular experiences in our day-to-day lives. 'Fields of care' also have a meaning, but unlike 'public symbols' this meaning is more personal and not immediately known to others, e.g. the place where you stood when you got a life-changing phone call. As such, their significance may not always be communicated to outsiders in comparison to public symbols.

Considering this, despite consultation being the form of engagement most commonly used by the Scottish Government for informing public policy, there is value in using a children's geographies approach to inform policy that affects how adolescents use open spaces. As explored in Section 1.2.1, there is a need for local authorities to learn more about the day-to-day needs of adolescents to create 20-minute neighbourhoods. Theoretically, I argue that the benefits attributed to the 20-minute concept are determined by the ability to create spaces that foster feelings of 'insideness' for local residents and act as 'fields of care'. However, these places are covert and subjective. As such,

it is impossible for adults to fully understand what makes a 'field of care' that fosters feelings of 'insideness' for adolescents i.e. an adult cannot guess the subjective value that adolescents attach to the places in their lives. Therefore, while not yet recognised or valued by policymakers, there is a lot to be gained by engaging directly with adolescents to learn more about the environments that shape their lives.

In addition to providing an understanding of place, placemaking, and how adolescents engage with/can engage with places, a children's geographies understanding of how adolescents engage with place has been applied in this thesis in several other ways. Methodologically, it informed my decision to work directly with young people in my initial data gathering phase and helped me address the ethical considerations of this study. It also informed my choice of data gathering tools, where I aimed to allow for flexibility in how adolescents expressed and represented themselves. In addition to this, it guided my decision to have participant responses steer the latter phases of my study. Children's geographies also provided a lens through which to view literature. As I read, I was aware of the status of adolescents in the studies I was reading i.e. were they the subjects of the research, participants in the research, collaborators in the research, or something in between. Overall, this approach profoundly influenced the theoretical and practical dimensions of this study and helped me critically engage with the literature base.

2.5 A theoretical understanding of how adolescents interact with their environment

So far, this chapter has identified adolescents as an oppressed group with little representation or voice about matters related to their use of open spaces. Their access to open spaces is managed by the decisions of adults, and these confines define adolescents' experiences in open spaces. These experiences are influenced indirectly by external forces, as evidenced in the Right to the City, and also directly by personal first-hand experiences, as evidenced through Tuan (1979) and Relph (1976). There is a need, therefore, for a further theoretical understanding that helps me 'make sense' of the various barriers and facilitators that influence how adolescents use open space, and particularly those who may arise through the findings of this research.

My understanding of the degree of influence that various factors have on how adolescents use open spaces is informed by Bronfenbrenner's Ecological Systems Theory (1979). The theory explores how different environmental influences, known as systems, impact child development. These systems can have a direct or indirect impact on an individual's development, and the strength of this impact changes over time. The theory describes five systems, and I will now describe each of these in turn (Christensen, 2010; Tudge et al., 2021; Snyder & Dunschere, 2022; Heyes et al., 2017):

The microsystem contains those who have a direct influence on the development of an adolescent and consists of parents, siblings, teachers, and all other figures who may interact with the adolescent on a face-to-face basis.

The mesosystem is where two or more members of the microsystem interact with each other about the adolescent. I recognise this system as fuelling Erikson's crisis of adolescence. Incongruent expectations between parents, teachers, and peer groups result in a need for an adolescent to navigate competing social norms, which may either present a barrier to building social ties with peers (McHale et al., 2009) or force the adolescent to be rejected by society. As noted in Section 2.2, adolescents can be denied recognition and inclusion by society due to the labels attributed to them as a group. These labels can be attributed by the mesosystem. As an example, conversations between adults about the presence of adolescents in open spaces may conclude that their behaviour does not conform to their expectations. A decision that adolescent appropriation of open space is threatening and disruptive results in adolescents being characterised as anti-social by adults.

The exosystem refers to systems that the young person does not participate in or contribute to but still have an indirect influence on their development (Onwuegbuzie et al., 2013). In the context of this thesis, this refers to those who engage in policy creation, such as the Scottish Government, and those who engage in policy implementation, such as local authorities and planning authorities. Adolescents do not partake in decision-making activities at this level. Instead, they are subject to and interact with the environments and conditions created by decisions made in the exosystem without their input. Thus, the influence wielded by the exosystem is profound in the development of the adolescent (Ben-David & Nel, 2013). The actors found in the exosystem exert both negative and positive forces on an individual by creating the rules

by which their contexts are created, and conditions under which interaction with their environment takes place (Kilanowski, 2017).

The macrosystem describes how culture influences the development of an adolescent. It relates to overarching belief systems and ideologies, and the influence of this can be observed in how members of the microsystem interact with the adolescent. An example of the influence of the macrosystem is found in Lefebvre's *Right to the City* (1996), where the processes of capitalism are observed to shape the urban environment. A capitalist economic system gives rise to profit driven urban development. This influences the zoning policies of local authorities (exosystem) which dictate, amongst other things, the areas where adolescents and their families can live, what their homes look like, and the types of open spaces afforded to them. Bronfenbrenner argues that the daily experiences of young people from similar societal groups tend to be broadly similar. While this thesis appreciates the fact that the experiences of all young people are distinct (drawing upon a children's geographies approach), it can be identified that Bronfenbrenner's argument acknowledges that, nonetheless, a young person's development is influenced by broader societal and cultural factors.

The chronosystem describes the influence of time, introducing the idea that the interactions and influences on the adolescent change throughout the life course. These changes can occur within the adolescent, such as going through puberty or becoming ill. They can also be external. External changes can be expected, such as the changes associated with the transition between primary

and secondary school, or unexpected, such as the sudden death of a family member.

Tensions exist between these systems. In addition to the conflicts that may exist between actors within a system (such as the expectations set by peers and parents in the mesosystem), there may also be competing influences between systems. In the context of this study, an example can be illustrated through the desire to use a public resource and the funding required to maintain it. An adolescent's friend group may decide to play football together in the park after school (mesosystem). However, the local authority that maintains the park (exosystem), due to economic pressures, may decide to invest funds usually spent on maintenance on something they perceive as being more valued by their residents (macrosystem). This might make the park unusable for the purpose that the friend group intended. As such, a tension is created where the influence of the economic climate, coupled with the influence of the values held by society, outcompetes the influence of the friend group upon the adolescent.

These systems do not work in isolation, and the actions of one influence the actions of another. As noted in Egan and Pope (2024) in their study of neighbourhood safety and outdoor play, what happens on a microsystem level can be influenced by decisions made at the level of the exosystem and the macrosystem. As such, ecological systems theory provides a backdrop by which other theoretical frameworks can be understood and related to each other. For example, the socially constructed perception of adolescents as unstable beings (macrosystem) influences how adults manage adolescent

engagement with open space (exosystem if planning authorities and mesosystem if a group of parents), which in turn influences their psychosocial development. Likewise, it is capitalism (macrosystem) that drives policy directives implemented by local authorities (exosystem) that deny adolescents their right to the city. Thus, many systems are observed to influence adolescent use of open space in this way.

The theory can also be applied to understand and resolve issues experienced in certain fields, such as children's geographies. The noted gap between research and practice can be bridged by a shared terminology that ecological systems theory can provide. Moore (2010), when reflecting upon interdisciplinary working between the fields of health, recreation, urban development, and education, notes that an application of ecological systems theory allows for one issue to be recognised by several fields as a common problem, serving as a basis for interdisciplinary working. Considering the challenges to cross-sector working in Scotland, the use of ecological systems theory to understand my findings, as applied in Collins et al. (2024) and Andrews et al. (2014), may allow my work to be mutually understood by researchers and practitioners in my fields of study.

As such, Bronfenbrenner's social ecological model plays a vital role in not only contextualising how my chosen theories operate by defining the influences experienced by adolescents, but also by providing a framework for interpreting my findings. It is hoped that this framework will provide a common language that will allow my findings to be understood by planners, health professionals, and teachers alike.

2. 6 Conclusion

In conclusion, this study is steered by an understanding of adolescence as a socially constructed phase of human development shaped by social perceptions that either enable or limit their levels of inclusion and participation in society. Adolescents, as urban inhabitants, have a right to appropriate urban spaces and participate in decision-making exercises relating to urban areas. While adolescents can participate in decision-making processes, their rights are ultimately suppressed by the actions of others.

How adolescents experience open space is influenced directly and indirectly by several factors. Decisions made with parents, between friends, or by policymakers affect adolescent use of open spaces in different ways. Some of these decisions involve adolescent participation and others do not. Decisions made by members of the exosystem, such as planning authorities and local authorities, that affect adolescent use of open spaces may not be informed by working directly with adolescents. Instead, they may be influenced by stereotypes based on the perceived instability of adolescents as a group. This creates a supposed need for their use to open space to be controlled, deterred, or closely managed for the safety of others. These stereotypes also portray them as poor decision-makers, thereby justifying their exclusion from those processes.

As such, adolescent use of open spaces is indirectly influenced by policies and procedures that may not reflect their needs or perspectives. These structural

influences shape the confines within which adolescents navigate and interact with open spaces. It is these confines and their current marginalisation from policy-making processes that make an adolescent's relationship with open spaces distinct from that of an adult. This theoretical understanding underpins the subsequent chapters of this thesis.

Chapter Three

Policy Context and Literature Review

3.1 Introduction

This chapter features the literature review for this study. Due to the multidisciplinary and exploratory nature of my research, this literature review has two aims. The first is to locate my study within the field. The second aim is to identify gaps in this literature base to create a set of research questions that will guide the next steps of this research. I begin this chapter by defining what is meant by urban open space in the context of this study, and its associated roles and functions in urban areas. This is followed by an identification of how adolescents use open spaces and an exploration of the role that open space plays in supporting health and wellbeing outcomes in urban areas. The extent to which adolescents are represented in policy on open space use in urban areas in Scotland is then explored. This chapter concludes by declaring the research aims and questions derived from the literature review.

3.2 Policies and definitions of open space

In the Scottish context, open space is clearly defined. The *National Planning Framework 4* (NPF4) (Scottish Government, 2023b:154) defines open space as 'space within and on the edge of settlements comprising green space or civic areas such as squares, marketplaces and other paved or hard

landscaped areas with a civic function'. This definition describes open spaces as multifarious spaces with no set location within a settlement. In Scotland, a settlement is classified as a built-up area of 500 people or more. As such, open spaces are found in a variety of settlement types such as villages, towns, and major urban areas across the country, making them a ubiquitous facet of day-to-day life for a majority of the Scottish public.

Open spaces have a strong presence in the lives of Scotland's urban population. According to Our Place (2024b), 54% of urban Scotland is covered in green open space of some kind. Although this figure does not include the presence of grey space or blue space in urban areas, it nonetheless highlights the importance of open space as a feature of Scotland's urban landscape. Urban areas constitute 2% of Scotland's landmass (Scottish Government, 2023e) but accommodate 72% of the country's population. Consequently, Scotland's population distribution is one of the most uneven in Europe, a status which the Scottish Government acknowledges as having adverse social and economic effects. A challenge exists in ensuring that infrastructure and basic services meet the growing demands driven by continued population growth in urban areas (Scottish Government, 2021). This signals that, while urban open space is a feature of the landscape that serves a large portion of the population, essential questions on the concentration and distribution of these spaces within urban areas are to be considered.

Not all built-up areas are considered urban. Whether a settlement is classified as 'urban' is decided by the *Scottish Government Urban Rural Classification 2020* (Scottish Government, 2022). In this classification, settlements are

divided into six categories based on population data produced by the National Records of Scotland. These categories are described in Table 3.1:

Table 3.1

The Scottish Government Urban Rural Classification (Scottish Government, 2022)

Scottish Government Urban Rural Classification	
Classification	Description
Large Urban Areas	Populations of 125,000 people or more
Other Urban Areas	Populations of 10,000 to 124,999 people
Accessible Small Towns	Populations of 3,000 to 9,999 people within a 30-minute drive time to a Large or Other Urban Area
Remote Small Towns	Populations of 3,000 to 9,999 people with a drive time over 30 minutes to a Large or Other Urban Area
Accessible Rural Areas	Populations less than 3,000 people and within a 30-minute drive to a settlement of 10,000 people or more
Remote Rural Areas	Populations less than 3,000 people and with over a 30-minute drive to a settlement of 10,000 people or more

As such, there are different degrees of urbanisation in Scotland, and this allows for nuanced discussions to take place that go beyond a traditional urban-rural dichotomy (OECD, 2020). In an urban context, a stratified classification system such as the *Scottish Government Urban Rural Classification* is beneficial as it limits the potential for a form of ‘urban bias’ where larger urban areas dominate discourse (Bailey et al., 2004). Instead, it facilitates comparisons of urban areas between and within various classifications. Through this, the different urban contexts in which open spaces are located can be understood, and sense can be made of how open spaces differ across various degrees of urbanisation.

Just as there are different degrees of urbanisation in Scotland, there are also different classifications of open space. By mentioning ‘green space’ and ‘civic

areas', the *NPF4* definition of open space recognises that open spaces can be both natural and built environments. This means that they are spaces that can feature elements of hard landscaping, soft landscaping, or both. This is a characteristic supported by *Planning Advice Note 65* (Scottish Government, 2008). *Planning Advice Note 65 (PAN 65)*, published by the Scottish Government, provides advice for local planning authorities on maintaining open space provision and creating high-quality new open spaces. *PAN 65* expands upon the *NPF4* definition of open space by providing a typology of open spaces. There are 11 different types of open spaces described in the typology, as outlined in Table 3.2.

As initially expressed in Chapter One, the open spaces specified in *PAN 65* are of national significance. The Scottish Government flags open spaces as being 'an invaluable asset' (2008:1) that support individual wellbeing, community wellbeing, and create a sense of community identity by evoking a sense of place. However, policy on open space management and assessment in Scotland is highly disaggregated and not explicitly linked to other related policy areas that are of strategic importance, such as public health or the climate crisis (Orr & James, 2013).

Table 3.2

Typology of open spaces, taken from Planning Advice Note 65 (Scottish Government, 2008:5)

Types of Open Space	
Type	Description
Public Parks and Gardens	Areas of land normally enclosed, designed, constructed, managed and maintained as a public park or garden. These may be owned or managed by community groups.
Private Parks or Grounds	Areas of land normally enclosed and associated with a house or institution and reserved for private use.
Amenity Green Space	Landscaped areas providing visual amenity or separating different buildings or land uses for environmental, visual, or safety reasons and used for a variety of informal or social activities such as sunbathing, picnics or kickabouts.
Playspace for Children and Teenagers	Areas providing safe and accessible opportunities for children's play, usually linked to housing areas.
Sports Areas	Large and generally flat areas of grassland or specially designed surfaces, used primarily for designated sports (including playing fields, golf courses, tennis courts and bowling greens) and which are generally bookable.
Green Corridors	Routes including canals, river corridors and old railway lines, linking different areas within a town or city as part of a designated and managed network and used for walking, cycling or horse riding, or linking towns and cities to their surrounding countryside or country parks. These may link green spaces together.
Natural/ Semi-Natural Green Spaces	Areas of underdeveloped or previously developed land with residual natural habitats or which have been planted or colonised by vegetation and wildlife, including woodland and wetland areas.
Allotments and Community Growing Spaces	Areas of land for growing fruit, vegetables and other plants, either in individual allotments or as a community activity.
Civic Space	Squares, streets and waterfront promenades, predominantly of hard landscaping that provide a focus for pedestrian activity and can make connections for people and for wildlife.
Burial Grounds	Includes churchyards and cemeteries.
Other Functional Green Space	May be one or more types as required by local circumstances or priorities.

Despite an overt focus on community in national policy in Scotland, the level of community involvement in the planning process is comparatively weak. Unlike its English counterpart, the *National Planning Policy Framework* (Ministry of Housing, Communities & Local Government, 2024), where public involvement in the planning process is explicitly mentioned as something that should happen, *NPF4* is less committal. In *NPF4*, it is stated that there are 'opportunities to involve a wider range of people in the planning system' (p.13) and that there is a mandate to ensure that people with protected characteristics are represented. However, this is only to express their views on plans and decisions already made and not to participate in the creation of these plans and decisions. As such, current policy framing suggests that decisions that impact how communities live and how they use open spaces are made for them, rather than by them.

This context is interesting once it is considered that residents of urban areas also place value on open spaces. Teymouri et al. (2017) found that urban residents across age cohorts and social status see open spaces as a vital component of urban living. In Scotland, larger multifunctional open spaces with direct use functionality are the most favoured (Roberts et al., 2022). These characteristics align open spaces with the concept of 'liveability', the ability of an area to fulfil the expectations of wellbeing and quality of life held by its inhabitants (Gough, 2015; Martino et al., 2021), by providing spaces for recreation, prospects to enhance societal resilience, and opportunities for urban populations to meet their environmental, ecological, and economic

needs (Koohsari et al., 2018; Nasution & Zahrah, 2012; Ward Thompson, 2002).

These contemporary roles of open space in Scotland align with the original intentions for open spaces as a community intervention. In the United Kingdom, the concept of designated open spaces originates from the 19th century practice of redeveloping urban centres to provide open public squares to improve the quality of life of working-class populations (Giles-Corti et al., 2005; Stanley, 2012). During this time, urban areas in the United Kingdom experienced high levels of rural to urban migration motivated by the increased industrialisation and perceived prosperity of urban centres. The resulting overcrowding of urban areas led to concerns over public health and the stability of urban communities, to which the establishment of open spaces was seen as a remedy (Hesse Dreher, 1993). Open spaces provided urban populations with fresh air, communal areas, and acted as venues for recreation. The positive effect of these services saw open spaces become a mainstay 'asset' in urban design.

Generally, contemporary open spaces are still intended to improve the quality of life of urban populations by fulfilling distinct functions. Open spaces can provide certain environmental and ecological services, which in turn prompt positive health outcomes on either an individual or community level. For example, open spaces have a vital role in micro-climate management (Macintyre et al., 2008). Green vegetation helps regulate temperature and manage air quality, both of which are factors associated with influencing levels of respiratory and cardiovascular disease (World Health Organisation, 2017;

United Nations Environmental Programme, 2020) and reduces incidents of noise pollution which is shown to reduce blood pressure in vulnerable populations (D'Souza et al., 2021). These examples demonstrate that open spaces positively influence physiological health.

Open spaces also positively influence psychological health and health emergency management. When managed appropriately, open spaces can become effective carbon sinks and contribute to systems supporting urban climate change adaptation. This, in turn, mitigates the risk of climatic factors that could exacerbate issues in health care provision. For example, prolonged heatwaves can put pressure on health services in urban areas, which already operate at high capacity due to a high density of service users (Hussain, 2022). Biodiversity is also identified as a health-promoting characteristic of open space (Methorst et al., 2021). Through the process of 'rewilding', where once manicured green open spaces are left to return to a natural state, open spaces operate as ecological or green corridors which promote biodiversity and reconnect urban populations with the natural world and its reported restorative effects (Wang & Foley, 2021). In addition to this, open spaces mitigate the impacts associated with natural hazards and serve as a venue where relief centres that support impacted communities can be stationed (French et al., 2019). Hence, open spaces serve as venues that not only foster positive psychological health but also enable communities to provide mutual support during times of emergency.

This point introduces open spaces as a venue for human interaction. Open spaces are an area for public life where social interaction and recreation are

promoted by design (Nasution & Zahrah, 2012). In instances where they are free to access (which, as described in Chapter Two, may not always be the case with Sports Areas or Private Parks or Grounds), open spaces operate as a communal space in a neighbourhood where residents are free to partake in individual or group, planned or unplanned, and formal or informal activities (Mehta, 2014). The social interactions that occur in open spaces facilitate subjective and emotional attachments to locations, forming a shared sense of place.

A shared sense of place promotes cohesive communities by allowing open spaces to be seen as a 'field of care' (a concept previously discussed in Section 2.4). In this sense, open spaces are described as a 'public good' and a community resource. As open spaces are managed by publicly funded local authorities in Scotland, they can be perceived as a public resource available for use by all citizens (Abbasi et al., 2016). However, Lefebvre's Right to the City suggests that there are economic constraints, such as those created by land zoning practices that segregate urban inhabitants into residential areas, that prevent this from becoming a reality. While the ecological and social functions provided by open spaces are freely available to users, how people engage with and are affected by the economic functions of open space is decidedly more complex.

This complexity is explored by Harvey in *The Urbanization of Capital* (1985). Although open spaces are not explicitly mentioned by Harvey in the text, they can be recognised as a feature of an urban built environment that Harvey argues is created primarily to support the reproduction of capitalism. Harvey

puts forward that the urban built environment is created mainly to support the circulation and accumulation of capital. The over-accumulation of capital can drive certain forms of urban investment, including investment in the built environment. This means that surplus capital is stored by investing in the creation of new physical features of the built environment. These investments are made with the intention of creating a built environment that is capable of sustaining further accumulation. In this sense, Harvey argues that the built environment functions as an economic resource.

When this lens is applied to open spaces, the opportunities for social interaction, recreation, and leisure mentioned previously as functions of open spaces can be understood to be processes that also serve the economic function of restoring the labour force in preparation for continued production. Therefore, although open spaces have social and ecological functions, they are not neutral elements of the urban landscape as they, like other features of the built environment, are created by and for the needs of capital accumulation.

To date, Harvey's interpretation of the role urban areas play in the reproduction of capitalism has received little criticism (Castree, 2007; Christophers, 2011). Nonetheless, some critiques do exist. Some authors view Harvey's standpoint as overly reductive. For example, Das (2023) critiques Harvey's tendency to group different processes together, arguing that it results in an approach that is too broad and theoretically and practically inadequate when trying to understand themes such as uneven development and profitability.

However, there is also evidence suggesting Harvey's theories can successfully explain patterns of urban investment. Christophers (2011), in an analysis of financial data on the run up to the 2008 financial crisis, identified a trend in which surplus capital was diverted from production and invested into the built environment. While this observation supports Harvey's argument that the over-accumulation of capital can be absorbed by the built environment, Christophers (2011) also acknowledges that due to the many different agents, types, and sites of investment, it is difficult to fully demonstrate this switch in investment with the limited empirical evidence available.

Similarly, Jauhiainen (2007), while not offering a direct critique, acknowledges the role that other actors, such as state and public authorities, play in the materialisation of urban environments. Agents such as those identified by Jauhiainen (2007) are central to the critique of Harvey's work advanced by Fainstein (2014). In a discussion of how a shift in urban policy focus from competitiveness towards social justice might improve the quality of life of urban populations, Fainstein (2014) highlights Harvey's reluctance to identify a specific agent of change capable of improving the lives of low-income urban residents within a capitalist system.

These critiques suggest that while Harvey's ideas remain highly influential in explaining how and why built environments are produced, they may understate the complexity of how patterns of urban development are influenced. Nonetheless, *The Urbanization of Capital* (1985) is a useful framework to understand the economic functions of features of the built environment such

as open spaces and the role they play in influencing patterns of urban development and investment.

Open spaces play a role in shaping patterns of urban development. Open spaces generate economic opportunities for their surrounding areas, and by doing so reinforce the process of urban growth and investment (Harvey, 1985). Open space is influential when choosing the location, type, and density of new residential developments in urban areas (Wu & Plantinga, 2003). Drawing upon the Burgess Urban Land Use Model (Rodrigue, 2020), it is expected that larger open spaces with high levels of functionality (characteristics which are described as favourable by Scottish urban populations by Roberts et al. (2022)) will lie on the peripheries of urban centres. Land, as a commercial asset, is more plentiful on the outskirts of urban areas. This allows for the zoning of larger open spaces, something that is not usually possible in central business districts and inner-city areas due to their high building densities, where less land is available for designation as new open space.

Just as the locations of urban open spaces are dictated by the needs of capitalism, so too are the locations of residential areas in urban areas via a process Harvey (1985) refers to as 'residential differentiation'. Land on the peripheries of urban areas is often demarcated for suburban housing developments, i.e. larger detached housing units with front and back gardens, chiefly accessible by private car. These expensive residential developments and their more affluent residents enjoy the benefits of being near or having the means to travel via car to these larger, well-equipped open spaces. Their ease of access to these spaces is greater than other populations due to their

economic status. Open spaces also have a positive impact on the property values of pre-existing residences in adjacent areas (Macintyre et al., 2008; Dehring & Dunse, 2006). Having an open space in proximity is a valuable amenity that increases the market value of a property.

Proximity to open space therefore functions as a valuable amenity that enhances property values and represents one factor within a broader mix of planning, market, and policy influences that results in accommodation in these areas being unattainable for lower-income groups. This suggests that high-quality open spaces are associated with socioeconomic exclusivity. Harvey (1985) explains this process through the tension between the exchange value and the use value of land. Exchange value refers to the ability of land to generate profit, particularly through rising land and property values. Use value refers to the ability of land to meet the everyday social needs of a population through direct use. Harvey (1985) argues that investment in the built environment tends to occur in residential areas where it can enhance the exchange value. It does this by making these areas more attractive to high income residents (increasing demand) while at the same time offering a leisure/recreational function that supports the restoration of the workforce. As a result, patterns of investment and quality of open spaces often vary across the urban landscape, with some lower-income areas experiencing reduced investment relative to higher-value locations. Thus, the distribution of open spaces can be understood as a capitalist process that may not only influence the function of open spaces (which Harvey sees as mainly economic) but also reinforce any existing patterns of 'residential differentiation' in urban areas. In

summary, the Scottish context provides a clear and comprehensive definition of urban open space. The view held by the Scottish Government, which sees open space as an 'invaluable asset', aligns closely with both historic and contemporary perspectives of the social and environmental benefits associated with open spaces. While open spaces also offer economic benefits such as an increase in property values, these are not equitably distributed. Having provided a general overview of open space and the general population, I recognise the need for a more refined exploration of how open space relates to specific groups. In light of this, the next section will narrow this focus by positioning the adolescent within this context.

3.3 Adolescents and open spaces in urban areas

Open spaces are a venue for adolescent social interaction and are an important feature in supporting adolescent psychosocial development. As previously identified, open spaces provide a venue for both organised and incidental social interactions to occur for the general public, including adolescents. In their review of the social determinants of adolescent health, Viner et al. (2012) recognised that interactions with peers are key in supporting adolescents in achieving positive health outcomes. In the United Kingdom, young people tend to spend progressively more independent time outside the home as they age and thus their engagement with their local environment increases. In tandem, opportunities to engage with societal norms and opportunities to interact with others outside of their family unit similarly

increase, leading adolescents to navigate their place within these social situations. Open spaces, as a feature of the local environment, therefore, play an important role in the social development of adolescents.

There is a notable scarcity of literature that explores which open spaces are used by adolescents in Scotland, with the limited literature that does exist focusing mainly on the effects of open space use rather than what types of open spaces are used. However, once contextualised with international examples, a general understanding of how adolescents use open spaces can be gleaned.

It is reasonable to assume that adolescent use of open spaces aligns with their development needs and that their use of open spaces differs from how younger children and adults use the same spaces because of this. As an example, in their study of a particular public park in a deprived urban community in North Staffordshire, Gidlow and Ellis (2011) observe that adolescents use this open space as a place for congregating and socialising. This use differed from the more recreational use enjoyed by the adult sample of their study. A similar finding is shared by Hegetschweiler et al. (2022), where, in the case of urban woodlands in Switzerland, there was a distinct difference in use between adolescent girls and adult women, with social activities such as meeting friends being more important in encouraging adolescent use, while restorative recreation activities such as going for walks were more influential for the adult sample. Together, these studies provide important insights into the specific motivations for adolescent open space use.

This distinct use of open space is also documented in a Scottish context. For instance, Roe et al. (2017) concluded that low-stress youth (aged 16 to 24) are more likely to have good social wellbeing, escape stressful situations by seeking the company of their peers, and have good access to open spaces. This finding suggests that the variables of wellbeing, socialising, and levels of access to open space are linked. As such, good access to open space may be important not only for facilitating social development in adolescents but also as a tool that adolescents can use to manage and regulate their wellbeing. This aligns with evidence derived from McCrorie et al. (2021). In their study of the use of the natural environment by Scottish 10- and 11-year-olds and its influence on their social, emotional, and behavioural wellbeing it was found that natural space may have a beneficial effect on how young adolescents manage their emotions. From these examples, it is reasonable to conclude that opportunities for social interaction provided by open spaces support young people's social and emotional wellbeing to a certain degree.

Specific patterns have been observed in the ways young people use open spaces. However, studies have not focused exclusively on the experiences of adolescents. There is a lack of consistency in the age ranges of participants across studies. The inclusion of participants aged between 12- and 15-years-old (Gidlow & Ellis, 2017), 14- and 18-years-old (Hegetschweiler et al., 2022), and 10- and 24-years-old (Viner et al., 2021) leads to only one age group being directly comparable across all studies (15-year-olds). This lack of uniformity makes it hard to be confident in generalising these findings. As a result, it is

also challenging to apply these findings to a Scottish context where there is no overlap in ages studied.

Scottish studies on young people's use of open space have focused on the younger end (10- to 11-years-old in McCrorie et al., 2021) and the older end (16- to 24-year-olds in Roe et al., 2017) which leaves a significant gap in the adolescent age range. It is difficult to extrapolate any generalisable observations from this sparse literature base and impossible to make international comparisons.

This blind spot in our understanding influences how adolescents are represented in both policy and practice. Fragmented knowledge bases, such as the one described, are a barrier to the development of sustainable urban environments that successfully reflect the needs of residents (Dickey et al., 2020). For example, public spending in Scotland is generally influenced by evidence and performance data (Scottish Government, 2025f), with funds allocated to projects likely to generate the greatest positive impact. In this sense, when allocating public funds for the creation or maintenance of open spaces, decisions are informed by what is currently known about open space use. Currently, this knowledge is primarily based on how young children and adults use open spaces. As such, a lack of concrete knowledge on how adolescents use open spaces leads to their absence in policy documentation, such as those discussed in Chapter One, that flag open spaces as being of national strategic importance.

In practice, urban design that emphasises ‘nudging’, i.e. purposeful design that encourages the population to engage with certain behaviours (Westin & Joose, 2022), also faces challenges. Designing spaces that encourage positive health behaviours within open spaces is challenging, given the limited understanding of how these spaces are currently utilised. In this case, a lack of understanding results in one of two negative outcomes. Either adolescents use open spaces designed solely for adults or young children, or they encounter spaces that attempt to mould their behaviour based on assumptions adults make about how adolescents should behave. Both outcomes ought to be avoided.

Therefore, there is a need for more research to be conducted in the Scottish context that bridges this gap and allows for comparisons with international research. There is also a need for research that views adolescents as a population group, separate from children and adults. Researchers have not explored the preferences of adolescents in much detail. It is common for studies to focus on the open spaces themselves, rather than setting out to learn from the adolescents who use them. For example, Gildlow & Ellis (2011) studied a small neighbourhood park in an urban community that just happens to be used by young people. The inclusion of adolescents here is coincidental rather than intentional. Whether or not this open space is favoured by adolescents in comparison to others is not considered. From this, it becomes apparent that the studies presented thus far provide us with a somewhat limited perspective of adolescent use of urban open space. Instead, we have a perspective of how English adolescents use parks, how Swiss adolescents

use urban woodlands, and how Scottish young adolescents use green spaces and natural spaces.

The typology of open spaces used in Scotland is broad and refers to both natural and built environments in both public and private spaces. Based on this, I assert that the existing literature is myopic and not fully reflective of the Scottish urban context. The literature search undertaken for this review found only one study that investigated the open spaces Scottish young people visited of their own accord. In a cross-sectional survey of one hundred 10- and 11-year-olds that investigated their access and use of urban landscapes, Olsen et al. (2019) found that other than home and school, the participants spent the most time in playing fields (referred to as Sports Areas in *PAN 65*), public parks, and play parks (referred to as Play Spaces for Children & Teenagers in *PAN 65*). This highlights a need for research on what types of open spaces older Scottish adolescents choose to use, how they choose to use them, and why they choose to use them in this way.

In summary, open spaces foster social engagement and peer interaction for adolescents. In doing so, they play an important role in supporting adolescent psychosocial development and may facilitate adolescents in achieving positive wellbeing outcomes. However, there are notable gaps in the literature relating to the specific types of open spaces that older adolescents prefer to use. The international literature base is limited by the lack of uniformity amongst the age profiles of participants, skewing both older and younger than the participant samples used in the shallow literature base in Scotland. This makes it

challenging to be confident in drawing contextually relevant conclusions from these studies.

Further research is needed to bridge these gaps and to provide a more holistic understanding of how and why older adolescents engage with urban open spaces in Scotland. It is equally important to consider any systemic factors, such as socioeconomic inequalities, that may influence how adolescents use urban open spaces to achieve positive health outcomes. In the following section, health provision in Scotland and the factors that influence health outcomes will be explored.

3.4 Health, wellbeing, and open spaces in urban areas

Every human has the right to experience the highest possible standard of health regardless of their personal characteristics or socioeconomic status and national governments are responsible for providing the appropriate measures for this to be realised (World Health Organisation, 2023). Following the implementation of the Scotland Act 1998, the Scottish Government gained the power to legislate for health. Health features prominently as an outcome in Scotland's *National Performance Framework*, the evaluative framework used to assess the government's ambition to 'create a more successful country' (Scottish Government, 2025a). Scotland's performance in health provision is measured by nine indicators (Scottish Government, 2018c) and there is a notable disparity in the outcomes recorded for these indicators across cohorts

of the Scottish population. This leads to a noticeable inequality in health outcomes in Scotland.

Health inequalities, or ‘the unjust and avoidable differences in people’s health across the population between specific groups’ (Public Health Scotland, 2024:np), are an area of national concern. In their review of the trends in health outcomes since the inception of the Scottish Government, Miall et al. (2022) describe stark differences across socioeconomic contexts, with those of higher socioeconomic status generally tending to have better health outcomes. This trend has not gone unnoticed by the Scottish Government. The desire to reduce health inequalities is addressed in the *2023-2024 Programme for Government*, highlighting the issue as a national priority area. According to Public Health Scotland (2021), the fundamental causes of health inequalities in Scotland are structural. These structural causes arise from social conditions in which there is an unequal distribution of income, wealth, and power. It is the unequal distribution of these assets that results in individuals and, indeed, certain demographics collectively experiencing poverty, marginalisation, discrimination, and poor health and wellbeing.

The unequal distribution of income, wealth, and power does not just occur between individuals or demographics. It is also observed between geographical locations. In their report on socioeconomic determinants of health in Scotland, Eiser et al. (2022) note that markers of wealth, income, and power such as typical weekly earnings and rates of child poverty vary across Scotland’s local authorities, with a wider variation recorded within local authorities themselves. This means that socioeconomic disparities are

observed between neighbourhoods within Scotland's local authorities. In turn, this results in a clear spatial pattern to the presence of health inequalities within Scotland's local authorities, with some neighbourhoods being associated with better health outcomes due to the socioeconomic status of their residents. This disparity is particularly pronounced in urban areas.

Spatial variations in health inequalities in urban areas have a historical precedent. The topic was first articulated in the context of the United Kingdom through government documentation by William Farr (1864) who described the differences in mortality rates between those living in urban and rural areas, with urban populations suffering much higher mortality rates than their rural counterparts. Analysis of spatial variations in health outcomes is not unique to Farr's work, and these inequalities have persisted over time. This is evidenced in *Inequalities in Health: Report of a Research Working Group* (1980). Rather than focusing on a rural/urban divide, the report, which is commonly referred to as '*The Black Report*' in health literature (Campbell & Ballas, 2016), acknowledges that there 'are marked inequalities in health between the social classes in Britain' (1980:57). It affirms that where a person lives can influence the availability of health services and resources, with those of a lower socioeconomic status being less likely to engage with health interventions. Collectively, these publications indicate that it has long been assumed that urban populations with a lower socioeconomic status are most likely to report poorer health outcomes. Over forty years after the publication of *The Black Report*, its influence is still felt in contemporary Scotland, where national policy

is frequently informed using tools such as the Scottish Index of Multiple Deprivation.

The Scottish Index of Multiple Deprivation (SIMD) is an area-based measure of relative deprivation. It is a standardised tool used by Scottish government bodies, local authorities, health agencies, and other parties to inform targeted policy making and to enhance understanding of the outcomes experienced by the most deprived members of Scotland's population. The SIMD uses the seven domains of 'employment', 'income', 'health', 'crime', 'housing', 'education', and 'access', to identify the levels of relative deprivation experienced across Scotland. As part of the Index, Scotland is broken into 6,973 units known as data zones. Each data zone roughly has an equal population and is scored on either a scale of 1 to 10 (deciles) or a scale of 1 to 5 (quintiles). Decile/Quintile 1 areas are the most deprived areas in the country and Decile 10/Quintile 5 areas are the least deprived. Through this, the factors that result in certain SIMD Quintiles/Deciles are comparable between data zones.

As a common framework used by policy makers, state agencies, and researchers alike, the SIMD facilitates cross-sector collaboration towards improving outcomes for Scotland's most deprived populations. However, it is criticised for having an urban bias, for oversimplifying deprivation, and for being overly reliant on quantitative data (Clelland & Hill, 2019; Fischbacher, 2014). Despite this, its propensity for a high density of data zones in urban areas is very useful for urban-based research, and opportunities arise to mitigate other limitations through the incorporation of qualitative data that

contextualises and balances the Index's quantitative outputs. Opportunities also arise by focusing on particular cohorts and demographics, such as Scottish adolescents, and their position within this data. In the next section, the socioeconomic disparities experienced by adolescents will be discussed.

3.4.1 Disparities in adolescent health outcomes

Health inequalities are evident among Scottish adolescents and typically arise from the unequal distribution of income, wealth, and power. While the consequences of income inequality have received particular attention in Scotland, much of the literature adopts a deficit-based perspective, emphasising what is 'wrong' with an affected population rather than their strengths or lived experiences. In this research, I am to move beyond this deficit framing, contributing insights that reflect the realities of adolescent's lives and the factors shaping their health outcomes.

Experiences of income inequality in early childhood are a predictor of life satisfaction during adolescence. Elgar et al.'s (2017) study of how early life experiences of income inequality affect health in adolescents aged 11,13, and 15 found that the degree of income inequality experienced during infancy was a predictor of health outcomes in adolescent girls, with those in higher income contexts being more likely to achieve better outcomes. Both male and female adolescents from affluent households have been found to self-report higher levels of health in comparison to their less affluent counterparts (Inchley et al., 2023a). As such, there is evidence to suggest that the health and wellbeing of

Scottish adolescents is likely to be associated with their socioeconomic context.

Disparities in young people's health outcomes along socioeconomic lines, such as those highlighted in Inchley et al. (2023a) have widened in Scotland over a 20-year period. This figure corresponds with overall trends in poverty and income inequality in Scotland. Figures taken from *Poverty and Income Inequality in Scotland 2021-2024* (Scottish Government, 2025c) estimate that 20% of Scotland's population were living in relative poverty during the period of 2021-2024. This is a 5% increase from the figure estimated in 2010-2011 (Scottish Government, 2012). With the number of people living in poverty in Scotland increasing on an annual basis, it can be predicted that income inequality, which is one of the structural causes of health inequalities, will also rise, resulting in greater disparities in adolescent health outcomes in Scotland.

This evidence from Scotland aligns with findings from other settings. Reiss (2013), when exploring the relationship between financial stability and wellbeing via a systematic review, surmised that there are a number of complex ways which socioeconomic status influences adolescent mental health problems, including low household income, low parental education, and limited access to care. Adolescents from socioeconomically disadvantaged backgrounds were 2-3 times more likely to develop mental health problems. It was also found that a decrease in socioeconomic status over time resulted in increased mental health problems. In addition to this, it was found that persistently low socioeconomic status was strongly related to higher levels of poor mental health. From this, it can be drawn that not only does experiencing

income inequality at infancy influence health outcomes at adolescence (Elgar et al., 2017), but negative changes to socioeconomic status during the life course and a current lived experience of socioeconomic disadvantage both result in poor adolescent health outcomes. It is necessary, therefore, to consider interventions that mitigate the impact of income inequality and socioeconomic status on adolescent health outcomes. In the next section, I explain the extent to which open spaces fulfil this role.

3.4.2 Open spaces as a health intervention

Open spaces can be used to mitigate poor health outcomes. However, the strength of this effect is unclear. There is limited literature that specifically relates open space use and adolescent health and wellbeing in Scotland, with the English context dominating research conducted in the United Kingdom and, as such, dominating policy briefings. As an example, Ward Thompson and Silveirinha de Oliveria (2016), in their review of evidence on the health benefits of urban green spaces for the World Health Organisation, include only one reference when discussing adolescents. This reference, which was a report published by Natural England on teenage use of wild spaces, does not represent the context of adolescent use of urban open spaces in Scotland.

Adolescents are underrepresented in publications relating to health, wellbeing, and open space. There is limited literature on the Scottish urban adolescent experience, and this is exemplified well in Krefis et al. (2018). In their systematic review assessing how the urban environment impacts health and

wellbeing, Krefis et al. (2018) found 24 articles that met their inclusion criteria. Of these articles, only one included adolescents. In this study, McCracken et al. (2016) explored the associations between green space and the quality of life of upper primary aged children in Edinburgh. It was found that green space had a small but positive impact on the quality of life of participants. However, the participant sample included children as young as seven and because of this, it cannot be ascertained whether this impact was more or less pronounced for the adolescent sample. Additionally, this serves as a further example of adolescents not being seen as a cohort in their own right with distinct psychosocial development needs in comparison to younger children.

The gap in literature pertaining to adolescent health and wellbeing and open space use in Scotland is a curious and conspicuous omission, considering that this is an otherwise well-populated field of study. For example, Short and Ross (2021) found that young people in deprived urban communities in Scotland are aware of the influence that their local area can have on their wellbeing. In another study based in the West of Scotland that investigates associations between health and the absence of environmental goods such as open spaces, Ellaway et al. (2009) found that almost half of their respondents living in the most deprived areas reported a lack of play space for children. Thus, some work that explores how deprivation influences the local environment exists, but is not extensive.

In addition to this, Marquez and Long (2021) note that levels of life satisfaction of 15-year-old adolescents in Scotland have decreased between 2015 and 2018, while Ward Thompson et al. (2014) found that green space is associated

with lower levels of stress in deprived Scottish communities. Ward Thompson et al. (2016) further expand on this finding by stating that this reduction in stress is not achieved through physical activity, which is often associated with stress reduction through the release of endorphins, but rather through creating opportunities for social interaction, which reduces feelings of isolation and reduces stress. These opportunities resonate with the psychosocial development needs of adolescents. All of these studies can be envisioned as creating a Venn diagram of sorts that features sets of deprivation and health and wellbeing, adolescent health and wellbeing, and open spaces and health and wellbeing, with no published study yet having the ability to occupy the union between these sets.

3.4.3 The impact of open space on adolescents

Looking beyond Scotland, some studies identify open spaces as having a positive impact on adolescent psychosocial processes. Zhong et al. (2023), drawing upon the *Southern California Children's Health Study*, found that adolescents residing in greener urban neighbourhoods of a low socioeconomic status were more likely to sleep for the recommended amount of time compared to those living in greyer areas. By supporting adequate sleep, open spaces can have a positive effect on adolescent cognitive development.

The effects of open spaces on adolescent cognitive development are also documented elsewhere. Ward et al. (2016) found that exposure to greenspace has a strong relationship with self-reported emotional wellbeing for 10- to 14-

year-olds living in Auckland, New Zealand. It was also found that green spaces are important for hosting physical activity, with every 1% increase in time spent in a green space resulting in a 0.95% increase in physical activity. The presence of facilities that are conducive to physical activity, along with feelings of security, an absence of crime, and being within proximity to a high number of green spaces were identified by Douglas et al. (2017) as the features of open spaces most consistently valued by adolescents. As such, many nearby open spaces with safe, appropriate sports facilities are conducive to greater open space use. This, in turn, results in more time spent in green spaces and thereby increased physical activity and better physical health outcomes.

The impact of proximity to open space on an adolescent's social, emotional and mental health and wellbeing is less clear. Many international studies record positive links between the quantity or proximity of open spaces and adolescent health and wellbeing. For instance, the percentage of park area in a neighbourhood was found to be an indicator of stress levels in adolescents living in New York State, with higher percentages being associated with less stress (Feda et al., 2015). Likewise, in another US study, Franklin et al. (2020) found that the presence of more residential green space mitigated environmental stressors experienced by adolescents. In addition to this, neighbourhood green space was also found to reduce aggressive behaviours in urban adolescents (Younan, 2016). This evidence suggests that a high presence of open green space can have a positive bearing on adolescent health and wellbeing.

Conversely, there is evidence that proximity to open space has little effect on the health and wellbeing of adolescents. Mueller and Flouri (2023) found that living within 1000 metres of a Site of Important Nature Conservation was not associated with lower levels of mental health problems or higher levels of esteem and happiness for their London-based sample of 10- to 15-year-olds. It is challenging to depict a simple causal relationship between open space access and adolescent health and wellbeing given the complexity of factors that influence health. There are instances where the impact of open space on adolescent health and wellbeing outcomes varies across socioeconomic contexts. For example, a longitudinal study conducted by Gubbels et al. (2016) in the Netherlands found that perceived improvements to green spaces did not have substantial impacts on the health outcomes among adolescents living in deprived areas. Likewise, Mueller et al. (2019) found that objective measures of green space could not predict mental health in English and Welsh 10- to 15-year-olds. Muller et al. (2019) suggests that one reason for this finding is that the relationship between objective measures of green space and mental health is likely moderated by factors such as socioeconomic status i.e. objective measures of green space might predict mental health for adolescents from certain socioeconomic backgrounds.

There are examples, however, where socioeconomic status was found to not affect adolescent wellbeing outcomes in open spaces. Li et al. (2018) examined the relationship between nature exposure and adolescent mood using a sample of 155 participants from four urban areas in Illinois. Following four days of GPS tracking, activity diaries, and mood assessments, it was

found that participants spent less than an hour outdoors every day, with an average time of 51 minutes on weekdays and 61 minutes on weekends. In this study, exposure to nature was positively associated with adolescent mood, but this finding did not vary between socioeconomic groups. Considering all of this evidence, it seems that the relationship between open space, adolescent health and wellbeing, and whether this varies between socioeconomic status is complex. It is not something that can be reduced to a simple formula but rather must take into consideration the situated complexity of adolescent experience.

Any consensus on the role that socioeconomic status plays in influencing the health and wellbeing outcomes achieved by adolescents in open space is further challenged by Mueller and Flouri (2021). When investigating the role of neighbourhood green space on emotional outcomes, they found that while green space has a beneficial effect on self-reported levels of mood, this impact is complex and, at times, negative in relation to levels of self-esteem. Consequently, more green spaces do not necessarily mean better outcomes for everyone at all times.

This conditional relationship between health, wellbeing, and open space was also identified in Wales et al. (2024). In their study of Swedish 12- to 15-year-olds, it was generally found that outdoor environments can have positive effects on the wellbeing of adolescents, although there were situations where this was not the case, i.e. spending more time outdoors on weekends was negatively associated with self-esteem and wellbeing. As such, it is possible for engagement in open spaces to harm adolescent wellbeing. This highlights

a need to explore other factors that may influence adolescent health outcomes in open spaces.

Age is another influence on the conditional nature of health outcomes in open spaces. Mueller et al. (2023) found that older adolescents aged between 13 and 15 benefit more from green space than younger adolescents aged between 10 and 12. Their study, which drew upon data from a UK household longitudinal study, focused on adolescents based in London. While an investigation into which green spaces are most beneficial was inconclusive, it was found that higher levels of green space were associated with more mental health issues for younger adolescents.

Factors that vary the influences of open space were also accounted for by Nieuwenhuis (2020). In their study, it was found that social cohesion (i.e. being able to identify with a community) was responsible for variations in adolescent health outcomes. As previously identified, open spaces in urban areas are locations that are conducive to building social cohesion and supporting adolescent social development. Therefore, it can be posited that even in neighbourhoods where open spaces are plentiful, if they do not properly support social cohesion, then they do not properly support adolescent health, wellbeing, and psychosocial development.

In their study of 2207 adolescents aged 14 and 15 from 39 neighbourhoods in Taiwan, Nieuwenhuis (2020) found that adolescent health differed between neighbourhoods due to varying levels of social cohesion within these settings, with higher levels of social cohesion and neighbourhood social capital resulting

in better health outcomes. This finding supports Dawson et al.'s (2019) US based study, where perceived neighbourhood social cohesion resulted in lower recordings of depressive symptoms in adolescents. Dawson et al. (2019) also found that social cohesion has a particular bearing on adolescents' health outcomes in lower socioeconomic settings. I argue that it is the design of a neighbourhood in addition to its socioeconomic context that influences social cohesion, something that is evidenced well through the various attempts to redevelop the Gorbals area of Glasgow where tenements, high rise flats, and mixed-use developments have resulted in different levels of social cohesion. This suggests that these international findings may be applicable to a Scottish context.

3.4.4 Summary

In summary, this section highlights that the literature base concerning the intersection of Scottish urban open space, adolescent health and wellbeing, and socioeconomic inequalities is limited despite health inequalities being an area of national concern. When drawing upon examples beyond Scotland, it is evident that this is a complex area, and it is not yet fully understood how or why urban open space supports or hinders adolescent health and wellbeing. My experiences align with Tillmann et al. (2018). In their review of literature which consisted of 35 included studies, they found that a wide variety of age groups, a wide variety of definitions of mental health (hyperactivity, stress, self-esteem, resilience), a broad definition of engagement with open spaces (accessibility, exposure, engagement), and a wide variety of open spaces

(school yards, parks, adventure experiences, wilderness therapy) were featured. Although my literature search was more concentrated by focusing on adolescents, I, too, encountered similar problems. The studies included in this section encompassed a range of adolescent ages, with some studies featuring adolescents alongside adult participants or, in one Scottish case, participants as young as seven. It is difficult to be confident in generalising the findings from this collection of studies.

The studies I encountered, including Scottish ones, frequently used the term 'green space'. This term ignores the built and hard landscaped civic spaces that are included as open spaces in Scottish planning policy. What is meant by 'green space' across international contexts can be questioned. A systematic review by Zhang et al. (2020) included 14 articles focusing specifically on the association between green space and adolescent wellbeing. This synthesis of literature yielded mixed results which further suggests that additional research in this field is warranted. While all included studies were quantitative, it is notable that a standard definition of open space or even green space was not shared. For example, there is a significant difference between '*windows opened onto greenspace*', which was used in one study (Li & Sullivan, 2016) and '*publicly accessible parks, sports fields and reserves*', which was used in another (Ward et al., 2016).

In addition to this, there was no consistent green space measure amongst studies, although remote spatial assessments of various kinds were the preferred method. Although I expected this issue to be mitigated in my review by focusing on a Scottish context with a thorough description of open space,

the lack of literature based in Scotland necessitated a broader outlook. Along these lines, there are also variations in what is considered 'health' and how it is measured. The studies I encountered used self-measurement tools, life satisfaction scales, data from household longitudinal studies, mood assessments, and activity diaries amongst others. I have found there to be little consistency in the field and little prior knowledge that can be directly applied to the Scottish context. Therefore, I assert that there is a need for a study that uses definitions of health and wellbeing and definitions of open space that are Scotland-centric to address this literature gap.

Following this discussion on the abilities of urban open spaces to support the health and wellbeing of adolescents, one area that has not yet been explored is the availability of open spaces in urban areas in Scotland and factors that promote or restrict access to them. In the following section, I review the literature relating to the availability of open spaces in urban areas.

3.5 Availability of open spaces in urban areas

As already noted in this review, the Scottish Government recognises that health inequalities in Scotland are structural, and the structures of society can both enable and cause barriers to positive health behaviours. However, those living in deprived urban environments blame their actions, more so than their social contexts, for their poor health outcomes (Scott-Arthur et al., 2021). This suggests that individuals feel an element of power and responsibility over their

own health and, therefore, may believe that they can make positive lifestyle changes to improve their health and wellbeing.

For individuals to make positive lifestyle changes they need certain resources to support good health behaviours. Open spaces can be considered such a resource. Individuals need to meet their core needs to maintain good health. This includes access to leisure, an activity that is frequently facilitated for adult populations through urban open spaces. Discussions of the availability of leisure facilities as an agent in promoting positive health and wellbeing (Scottish Government, 2018a) suggest potential circumstances in Scotland where access is not possible for some urban populations. Based on this, one may question whether access to open space is also an issue for adolescent populations. In the previous section, it was found that the effect of nearby open space on adolescent health and wellbeing was complicated, with the frequency and duration of adolescent visits to open spaces being factors that mitigated positive or negative effects. Considering that these are factors that occur when an adolescent is already in an open space, it is therefore worthwhile to investigate whether there are additional factors that influence the availability of open space or enable/deter adolescents from using them.

The value in managing the built environment to support health outcomes is a contentious issue. Moore et al. (2018) maintain that there is weak evidence to suggest that health interventions implemented using the built environment positively influence mental health outcomes. In contrast, Barton (2009) states that spatial planning and the management of the built environment is inextricably connected to health inequalities in a community. Findings outlined

in Mitchell et al. (2015) show that health inequalities potentially narrow in places with access to green spaces. However, simply living near open spaces as a health resource does not mean that all members of a community can improve their health and wellbeing automatically.

Kapilashrami and Marsden (2018) argue that people living in the same neighbourhood do not necessarily have the same access to health-enabling resources. The resources may be physically present but that does not mean they are available to all. Recalling issues related to Lefebvre's Right to the City, opportunities to enter open spaces may be restricted due to private ownership, private membership, restricted hours, infrastructure issues, and safety concerns. Indeed, McMinn et al. (2020) advise that even in cases where the most disadvantaged socioeconomic groups in Scotland live near these resources, this does not automatically empower them to use these resources to improve their health. As an example, Macdonald (2019) found that a lower income adult sample was only willing to travel half the distance than a higher income sample to access public and private health facilities. Distance was also reported to be the main reason for infrequent visits to green spaces in Edinburgh and Ljubljana (Žlender and Ward Thompson, 2017). Thus, if distance is a barrier for accessing open spaces more generally, it can also be deduced as a barrier to accessing open spaces for health purposes.

The distances that adolescents travel to open spaces have been considered in research. There is a literature base that explores the distribution of open spaces in Scottish urban areas, how this differs based on socioeconomic contexts, and the mobility of young people. However, these studies are

primarily focused on the cities of Aberdeen, Dundee, Edinburgh and Glasgow and draw upon younger adolescents aged 10- and 11-years-old. This is primarily due to these studies drawing upon the Studying Physical Activity in Children's Environments (SPACES) data set.

I argue that the lack of representation of Large Urban Areas and Other Urban Areas in other parts of the country renders this literature base unrepresentative of a significant portion of urban Scotland. This highlights a need for further research that includes areas beyond the central belt of Scotland and without city classifications. Likewise, the absence of research of young people older than 12-years-old is problematic as it ignores the cognitive, emotional, and physical changes that are associated with older adolescents. Nonetheless, this limited research in a Scottish context, when contextualised with international studies, provides some useful insight into barriers and enablers of adolescent open space use. The following sections outline the Scottish literature base and then contextualise it by drawing upon international comparisons.

3.5.1 Factors that influence open space availability

How Scottish adolescents use open space depends on their socioeconomic context. Olsen et al. (2019) found that Scottish 10- and 11-year-olds from more deprived areas spend more time in playing fields and play parks than their less deprived counterparts. The distribution of play parks in Glasgow was recorded, with more play parks found in the more deprived areas than in the more affluent areas. This finding suggests that there is perhaps an inequity of distribution of

certain types of open spaces in Scottish urban areas, and the quantity of a particular type of open space may be linked to the frequency of use. Picasia and Mitchell (2022) partially confirm this. When focusing on the cities of Dundee, Edinburgh, Glasgow, and Aberdeen, it was recognised that the distribution patterns of urban spaces and the segregated nature of Scottish urban populations result in socioeconomically segregated urban green spaces. In all cities but Dundee, populations with lower socioeconomic status resided on the periphery of urban areas in estates that have poor walkability, which decreases willingness to visit urban green spaces. Together, these studies provide important insights into how access and use of open space may differ due to socioeconomic contexts.

A difference in open space distribution along socioeconomic lines was also found by McCrorie et al. (2021) but only in some instances. It was found that 25% of their sample had natural space within 100 metres of their homes, regardless of their socioeconomic status. However, for private space, a social pattern emerged, indicating that individuals living in higher-income areas were more likely to reside closer to private spaces than those in lower-income areas. This further suggests that any suspected inequality in distribution and proximity is complex with specific open spaces being more prevalent in certain socioeconomic areas (in this case, play spaces in deprived areas and private parks and gardens in less deprived areas). Drawing upon a framework based on the 20-minute neighbourhood concept, Olsen et al. (2023) furthers our understanding of the mobilities of Scottish young people, open spaces and socioeconomic contexts. It was found that young people from more deprived

areas had better proximity to a greater variety of health-benefitting environments such as open spaces. It was also found that young people spent 60% of their time within their 20-minute neighbourhood. A synthesis of these studies suggests that there are variations in how open spaces are accessed by adolescents across social strata in Scotland.

To sum up, Scottish young people's engagement with urban open space is an activity that is restricted to their local area, though the types of spaces in their local area can be influenced by their socioeconomic context. However, these studies may be criticised for using geographical or temporal limits that underestimate the independent mobilities of the participants. While I acknowledge that the independent movements of young people aged 10 and 11 may be limited, it is known that they spend 40% of their time beyond the boundaries of their 20-minute neighbourhood (Olsen et al., 2023), suggesting that they may not be solely reliant on open spaces within 100 metres of their homes. This percentage is likely to be higher for adolescents over the age of 12 due to their increased level of independence from their parents. Young people aged 10 and 11 tend to travel under parental supervision. While we know that this age group go to Play Spaces, Sports Areas, and Public Parks & Gardens most frequently (Olsen et al., 2019), we cannot be sure that this is of their own accord, as it may be the case that their parents take them there.

While adolescents are characterised by taking risks, parents are typically more risk-adverse than their children. They are also typically more risk-adverse than previous generations of parents. Intergenerational differences in the freedom of children and young people to move around independently without

supervision, known as independent mobility, have been recorded by Bhosale et al. (2017). In a New Zealand-based study of 544 children (mean age of 12.2 years) and 500 parents, researchers found that parents had greater freedom to roam when they were children than their children. Research conducted in a Scottish context is helpful in gaining an understanding of why this may be the case. Scottish based studies like Teedon et al. (2014) and Turner et al. (2006) highlight how parental perceptions of what constitutes a 'proper place' for their child can act as a barrier to independent mobility, with adults often acting as gatekeepers.

The mobility patterns of older adolescents tend to be less restricted due to their increased independence. However, increased opportunity to visit a space does not necessarily translate to an increased number of visits. This is described in Bell et al. (2003) where it was found that adolescent interest in accessing woodlands in Central Scotland waned by the age of 15 unless adolescents needed to visit due to a particular activity or function. Therefore, while findings about the functions, preferences and movements of younger Scottish adolescents offer valuable insights, they cannot be generalised to older age groups. This suggests a need for further research to explore these mobility patterns more comprehensively.

3.5.2 International comparisons

Scottish findings on younger adolescents' access to open spaces align with other examples. Mears et al. (2019) found that children and young people living

in deprived areas in Sheffield had the best access to green space. Meanwhile, Yi Jian et al. (2021), when studying three neighbourhoods of differing socioeconomic contexts in Hong Kong, found an uneven distribution of open spaces amongst neighbourhoods, a finding supported in Thinh Do et al. (2019) in their study of Da Nang, Vietnam and Alderton et al. (2022) in their study focusing on eight Australian cities. Interestingly, it was identified by Mavoa et al. (2015) that while socioeconomically disadvantaged neighbourhoods in Melbourne, Australia were closer to open space than their more affluent counterparts, these open spaces were more likely to be smaller than the open spaces found in socioeconomically advantaged areas. This is a result of the urban context: In reference to Dublin, Ireland, Wang and Foley (2021) explain that as an area becomes more 'built up', it leads to a reduced per-capita green space allocation. Many cities in the United Kingdom feature an 'inner city' area characterised by high-density terraced or tenement housing, which, if ungentrified, accommodates a population that is generally less affluent than those associated with central business districts and suburbs.

One may therefore consider whether this allocation negatively impacts socially marginalised communities more frequently due to their increased likelihood of living in areas of higher building density. While many Scottish cities have a history of industrialisation, it is important to note that this pattern was only found by Picasia and Mitchell (2022) in Dundee. Therefore, while urban density can be a factor that negatively influences access and availability of open spaces in some Scottish contexts, such as Dundee, in the cases of Aberdeen, Edinburgh and Glasgow, where populations with lower socioeconomic status

reside in peripheral estates with poor walkability, mobility is suspected to act as more of a barrier. Whether this finding applies to Other Urban Areas in Scotland is unknown.

In this sense, national overviews of the spatial distribution of people and places can be useful in understanding the spatial distribution of open spaces across the population. This is the case elsewhere. The *Urban Green Nation Report* (2010), completed by the Commission for Architecture and the Built Environment (CABE) through an analysis of 16,000 individual green spaces in England, determined that the most affluent 20% of electoral districts have five times the amount of green space per person than the most deprived 10%. This study is significant in that it is the first nationwide review of evidence relating to quantity, quality, and use of green space in urban areas in England, offering a comprehensive view of the provision of this resource for the first time.

Abbasi et al. (2016) identify that there has been no study similar to the *Urban Green Nation Report* conducted within Scotland and, as such, no data to inform policy relating to the provision of open spaces. My updated search only identified the Ordnance Survey Greenspace Map (a data set that broadly follows the *PAN 65* typology but only records Public Parks & Gardens, Sports Areas, and Allotments), but no report comparable to the *Urban Greenspace Report*. This identifies a knowledge gap relating to how open spaces are distributed within and across Scottish urban areas of various classifications and whether this distribution varies along socioeconomic lines.

3.5.3 Summary

In summary, the availability of open space is varied for adolescents. Availability is first dictated by where they live. Some urban areas are documented to have good availability of certain types of open spaces, and, in some cases, this is aligned with socioeconomic status. In Scotland, young adolescents spend most of their time within 20 minutes of their home and are more likely to visit sports areas, play spaces and parks. The literature base in Scotland is highly reliant on studies of 10- and 11-year-olds as most studies use the SPACES dataset. Due to the distinct difference in needs and mobilities between this age group and older adolescents, it is difficult to be confident that these conclusions also apply to those aged 12 and over. Therefore, there is a glaring lack of literature that explores the mobility of adolescents aged 12 and over in urban areas in Scotland. Due to studies primarily focusing on Aberdeen, Dundee, Edinburgh and Glasgow, there is also a need to explore the rest of urban Scotland.

As it is evident that older adolescents have yet to be the sole focus of research in Scotland, a subsequent question is: do older adolescents have a place in Scottish policy pertaining to open space? This will be explored in the next section.

3.6 The place of adolescents in Scottish open space policy

Vanderstede (2011) introduces adolescents as an invisible group in urban design despite their strong orientation towards using open spaces. This review

has so far highlighted that adolescents are notably absent from the WHO's *Landscape Perceptions and Use of Green Space* report (Ward Thompson et al., 2014), with adolescents only mentioned once and children mentioned several times. It is now of interest to determine the extent to which adolescents are mentioned in policy concerning urban open space in Scotland.

A search of the *NPF4* (Scottish Government, 2023b) for the terms 'adolescent', 'teenager' or 'youth' yields no results. This indicates that this age group is not overtly represented in the national spatial strategy for Scotland and therefore does not feature in the country's spatial principle, regional priorities, national development priorities, or national planning policy as a specific cohort. There is, however, mention of 'children and young people'.

NPF4 advocates there should be 'well-designed, good quality provision for play, recreation, and relaxation' (p. 72) for young people, and that the 'public realm should be inclusive to enable children and young people to play and move around safely and independently'. It stipulates that new and improved play provision will 'be suitable for different ages of children and young people' and 'be easily and safely accessible by children and young people independently'. The *NPF4* also endorses 'that young people must play an active role in planning', making explicit mention of the UN Convention of the Rights of the Child (UNCRC) (p. 13). This commitment has since been strengthened by the incorporation of the UNCRC into Scots law in accordance with the UNCRC (Incorporation) (Scotland) Act 2024. These statements strongly suggest that in *NPF4*, adolescent use of open space is indistinct from that of younger cohorts. It also seems that adolescent use of open space

relates predominantly to spaces that are conducive to play and leisure. These points conflict with what is known in the literature.

The status of adolescents depicted in *NPF4* is also reflected in other planning policies. A similar keyword search of *PAN 65* yielded two results. The first is featured in the title of an open space: 'Playspace for children and teenagers', a definition of which is represented in Table 3.2. While the separation of children and teenagers in this title recognises that these are individual cohorts, the use of the word 'and' signifies that they are still grouped together to a certain extent with the play space being intended for use by both groups. Interestingly, though, any potential acknowledgement of these being separate cohorts is not shown in the definition of play space that is provided: 'areas providing safe and accessible opportunities for children's play'. While there is some acknowledgement of children and teenagers being separate cohorts, this distinction is not fully reflected in practice. The distinct use of space by these groups is not recognised.

The second mention of teenagers in *PAN 65*, perhaps works towards mitigating this bias towards younger children, although this is ambiguous and open to interpretation: 'Very different standards are also likely to be required for different functions such as play spaces for children and teenagers and informal recreation areas' (p. 10). It is unclear whether this statement refers to the different functions attributed to spaces considered to be 'play spaces for children and teenagers' which, using the definition provided, would be different types of play. Perhaps it refers to the function of this type of open space in the social, physical, and cognitive development of young people. On the other

hand, perhaps it highlights that play spaces serve different purposes for children and teenagers. There are no contextual clues to direct how this sentence should be read, resulting in this ambiguity.

Interestingly, while adolescents are not predominantly featured in planning policy, their use of open space is overtly mentioned in policy on public health and education. *The Place Standard Tool* (Our Place, 2024c), a framework developed by the Place Standard partners (Scottish Government, Public Health Scotland, Architecture & Design Scotland, the Improvement Service and Glasgow City Council) makes explicit mention of teenagers in sections of the tool guidance related to play, recreation and feeling safe in community spaces, and mentions teenagers as a demographic of park users in the community guidebook. A version of the tool specifically aimed at young people aged 12 and over has also been published. By doing so, the *Place Standard* acknowledges the unique use of both natural and built environments by adolescents, their mobilities, and the importance of recognising how they feel in and around their local area.

As touched upon in Section 1.2.3, links between outdoor environments and health are also recognised in the national curriculum of Scotland, *Curriculum for Excellence* (CfE) (Education Scotland, 2010a). In *CfE*, outdoor learning in urban green spaces is recognised as contributing to a healthier Scotland by promoting positive health behaviours that support physical and emotional wellbeing. This claim is reinforced in the Scottish Government's *Learning for Sustainability: action plan for 2023-2030* (2023c), which clearly outlines the outdoors as a core learning environment for the development of good health

and wellbeing in young people. As this is a national action plan, it asserts that adolescents having access to open spaces to support their health and wellbeing is of national importance. Therefore, there is a conflict when it comes to the place of adolescents in Scottish policy as the domains of public health and education actively promote the use of open spaces to improve adolescent health outcomes. In contrast, the domain of planning (the domain that has control over where open spaces may be, their quality, and their function) pays little attention to adolescents.

3.6.1 Summary

To conclude, in examples of Scottish planning policy on open space, adolescents experience a similar position as they do in literature. They are not seen as a particular population group and are often grouped with other age groups. Considering that the theoretical framework of this study views adolescence as a transitional stage between childhood and adulthood, where several biological, cognitive, and social changes occur that manifest as a distinct set of psychosocial needs, the framing identified in literature and policy is not appropriate. While a review of literature saw adolescents mixed with both older and younger participant samples, policy sees them persistently being grouped with children. Therefore, considering the policy context, it is not surprising that most literature based in Scotland focuses on an age profile that consists of either children or both children and adolescents. The literature base and policy base relating to how children and adolescents use open spaces are relatively complementary.

However, I find this to be insufficient. While previous sections have made it clear that this arrangement does not reflect the characteristic development needs of adolescents as a cohort, a review of policy in other fields such as public health and education shows that not only can adolescents be recognised as a distinct group of open space users, but their use of open space is actively promoted to meet national health outcomes. I argue that efforts in public health and education to support these outcomes are in vain unless they are also reflected in planning policy.

Based on my review, I do not believe that these health and education outcomes are reflected in planning policy or indeed literature conducted in Scotland. Therefore, there is a need for research to be conducted in Scotland that explores adolescent use of spaces and how it relates to health and wellbeing outcomes; a study that both bridges the age gap that exists in current conceptions of ‘children and young people’ in planning policy and literature and provides insight into how open spaces support the health and wellbeing of adolescents. This will serve to provide an evidence base for further health and education policy making in Scotland that pertains to adolescents.

3.7 A Conclusion: Scottish adolescents, open space, health and wellbeing

In light of this review of literature, it is apparent that there are several underexplored areas on the impact of open space use on adolescent health and wellbeing in Scotland. Literature on the role of open space as part of the

urban landscape associates open spaces with social, environmental, and economic benefits for urban populations, but these benefits are diminished by socioeconomic disparities in availability. Adolescents use open spaces differently from adults and tend to use them for congregating and socialising. Adolescents reportedly use open spaces to support their wellbeing and self-regulate their emotions. One may assume that having available open space is the primary factor in adolescent use and, in turn, positively affects the acquisition of positive health and wellbeing outcomes. Use of open spaces can have a positive effect on adolescent health and wellbeing, with physical wellbeing documented to be well supported. However, the extent to which mental, emotional, and social wellbeing is supported is not fully understood, with mixed outcomes being recorded across socioeconomic groups. This makes the impact of open spaces on adolescent wellbeing largely inconclusive.

The relationship between availability of open spaces, adolescent use of open spaces, and the extent to which it supports various types of adolescent health, wellbeing and development needs is complex. This complexity is further compounded in the Scottish context by the subject matter of the pre-existing literature base, a base that focuses predominantly on young people aged 10- and 11-years-old, living in the cities of Aberdeen, Dundee, Edinburgh, and Glasgow, and that visit spaces pre-chosen by the authors. This results in a limited view of the field that offers little in the way of contrast to international examples. It also highlights a fundamental gap in how older adolescents in Large Urban Areas and Other Urban Areas across Scotland engage with the

built/grey and natural/green spaces considered open spaces in Scotland. It is notable that planning policy in Scotland also neglects to recognise older adolescents, instead referring to 'children and teenagers' or 'children and young people' in documentation. This results in a lack of representation of adolescents in planning policy.

The lack of representation of adolescents in planning policy and literature relating to the use of open spaces can be seen as a barrier to the achievement of national priorities. This is particularly the case for the areas of public health and education, where the adolescent's relationship with open spaces is valued as an indicator and supporter of health and wellbeing outcomes. While literature from international contexts on older adolescents can be used to inform and justify these policy positions, and some of this was drawn upon in this review to supplement a limited Scottish literature base, it can never fully represent the unique context of urban Scotland. I argue that this circumstance also does not make best use of a situation where the areas of planning, public health, and education are devolved powers under the jurisdiction of the Scottish Government.

However, it is difficult for these fields to 'talk' to each other due to Scotland's sub-national governance model. Planning is managed on a local level through 34 planning authorities, education is managed on a local level through 32 local authorities, and public health is handled on a regional level through 14 NHS Regional Health Boards. There is little overlap between these organisational structures. Therefore, there is space for a study that acts as a bridge between these fields; a study that draws upon the terminology of Scottish planning

policy and contributes depth to the current literature base while also aligning and contributing to objectives outlined in national public health and education policy on adolescent health and wellbeing. It is this need that justifies this research.

3.8 Research aims and research questions

Following a review of literature, the main objective of this study is to identify the types of open space typically used by adolescents in urban areas in Scotland and to identify the extent to which adolescents recognise open space as a factor that supports them in achieving positive health and wellbeing outcomes. In addition to this, this study seeks to identify whether there is equal distribution of open spaces used by adolescents across urban areas in Scotland, and to explore whether any inequalities in distribution align with spatial measures of relative deprivation.

This study aims to answer the following research questions:

1. What are the activities and characteristics associated with the types of open space visited by adolescents aged 12 to 15?
2. Is visiting open space associated with adolescents' subjective wellbeing?
3. What are the spatial distribution patterns of the types of open spaces used by adolescents within the boundaries of Scottish urban units?

4. Are the spatial distribution patterns of open spaces used by adolescents within the boundaries of Scottish urban units associated with area-based measures of relative deprivation?

A visual representation of the theoretical concepts described in Chapter 2 is provided in Figure 3.1. This representation shows how the different theories used in this thesis interact and serves the purpose of foregrounding the assumptions and key concepts that shape this research. The diagram uses Bronfenbrenner's Ecological Systems Theory (in green) as a scaffold to categorise and organise how key concepts interact and/or are influenced by each other. To help classify concepts in relation to chosen theories, a colour coded key is used. Blue boxes are associated with Erik Erikson's theory of psychosocial development. Orange boxes correspond with ideas expressed in Lefebvre's right to the city. Concepts related to children's geographies are in pink.

There is an instance where one concept relates to two theories, and this is coded as such using a crosshatch pattern using the two associated colours. This example is the box on the far left-hand-side of the diagram 'influences on the adolescent and the ability of the adolescent to influence changes over time' which relates to concepts expressed by Erikson and is of interest to children's geographers. This pink and blue crosshatch may appear as purple on the diagram. White boxes detail contextual factors wherein this study operates that do not specifically align with theories described in Chapter 2.

In Figure 3.1, the direction of an influence or relationship is indicated by arrows. Black arrows indicate an influence travelling from left to right e.g. the influence of the mesosystem on the exosystem. Red arrows indicate an influence travelling from right to left e.g. the influence of the microsystem on the adolescent. Where an arrow contains an 'X' this indicates an intended influence that is unfulfilled e.g. the influence that adolescents hope to have on policy makers in the exosystem.

Although the diagram in Figure 3.1 may appear complex at first glance, its layered structure is essential for illustrating how interconnected and mutually reinforcing these theories are within the context of this research.

The subsequent chapter outlines the methodological approaches that have been taken to answer these research questions.

Diagram of key theoretical concepts in this thesis and how they interact (author's own)



Chapter Four

Methodology

4.1 Introduction

In my Literature Review, I concluded that there is a gap in knowledge relating to Scottish adolescents, urban open space, and health and wellbeing. Due to the sub-national governance model in Scotland and the existence of research silos, generating knowledge that can be applied to inform practice across these areas is a challenge. Planning, public health, and education are distinct disciplines/sectors and there is little overlap in, and between, research, policy, and practice. Therefore, an opportunity exists for this study to bridge this gap.

In this chapter, I outline my research methodology. First, I explain this study's affiliation with a post-positivist paradigm. Then, I share the research design for this study, which is an exploratory sequential mixed methods design consisting of two phases. The subsequent sections of this chapter outline data gathering tools I used in each phase of this study, the ethical considerations associated with my chosen research design, and the tools of analysis I used to interpret gathered data. The chapter ends with a summary of my research methodology.

4.2 Research philosophy

This research is post-positivist in approach. In this study, I wanted to explore adolescent experiences with open spaces. I was interested in the types of open spaces adolescents visit, the characteristics of these visits, and how their

experiences made them feel. Despite this, my research could not adopt an interpretivist approach. This is because I was also interested in exploring the physical environments and the socioeconomic contexts that shape how adolescents use open spaces. Using an interpretivist approach to answer my research questions would not grant the ability to gather the spatial data needed to contextualise the experiences of my participants. Likewise, a fully positivist approach would erode the context dependent experiences of participants. To support the particular focus of this research, I adopted a broadly post-positivist approach.

A post-positivist approach reflects my aims for this research. According to Ryan (2006:18), 'the post-positivist researcher assumes a learning role rather than a testing one'. My research does not set out to 'prove' anything. Rather, it seeks to address a gap in knowledge, bridge the gap between the public health, planning, and education sectors as described in Chapter One, and mitigate the barriers between academia and practice described in Chapter Two. In this sense, it is an exploratory study as it sets out to provide insight into a topic where little is currently known (Swedberg, 2020).

Each field associated with this study has a different understanding of what types of data are most useful. Therefore, there is a need for this research to address both the quantitative and absolute aspects of public health and planning, as well as the frequently qualitative and relational aspects of education. Post-positivism allows me to address this need by allowing me to use qualitative, quantitative, or mixed methods approaches when answering my research questions.

The knowledge created through a post-positivist approach is viewed in a particular way. By adopting a post-positivist paradigm, I accept that it is impossible to apprehend a single true reality (Racher & Robinson, 2002). While it is possible for me to create a large data set based on my participants' contributions and make predictions based on this through contextualising their experiences with spatial data, I recognise that this knowledge cannot be definitive. As this is an exploratory study, there will be opportunities for further research based on my findings and the knowledge created through this thesis is subject to revision at a later date. In this regard, I subscribe to Karl Popper's theory of falsification (Popper, 1963) by maintaining that knowledge is advanced through challenging hypothesis and finding instances where they are refutable.

It is important that my research adopts a paradigm that provides an approach to research ethics that can be applied across each element of my work. Through post-positivism, data gathering tools are subjected to ethical scrutiny that accounts for the bias and positionality of the researcher (Ryan, 2006). Post-positivist research sees the creation of knowledge as dependent and influenced by the values and cultural contexts of the researcher and their participants (Fox, 2008). Therefore, knowledge cannot be neutral as the biases of the researcher and the perspectives of the participants inherently shape it. I recognise that my motivations for conducting this research cannot be detached from the research itself (Clark, 1998; Ryan, 2006).

In line with a children's geographies theoretical framework, through a post-positivist paradigm I view my participants as co-creators of knowledge, and I

see each participant as an accumulation of individual lived experiences, memories, opinions, and contexts. In this sense, my participants offer a window into the multiple realities associated with open space use, allowing for a rich discussion to take place. While I recognise that my work cannot provide a definitive answer to how adolescents use open spaces and how physical environments and socioeconomic contexts shape this use, my chosen paradigm, by being reductionist, allows me to understand components of this reality (individual experiences), and through this I am best equipped to understand the entire system being studied as much as possible.

In sum, by granting me the ability to conduct my research in a manner that allows for multiple perspectives to be taken into account, post-positivism is the only paradigm that allows me to combine spatial/quantitative data with lived experiences in a way that matches my interdisciplinary aims.

4.3 Research design

I developed an exploratory sequential mixed methods research design for this study. This involved an initial data gathering phase of primary quantitative and qualitative data, known as Phase One, and a second data gathering phase of secondary quantitative spatial data sets, known as Phase Two. In this section, I begin by discussing the advantages and disadvantages of mixed methods research. I then describe the sequential mixed methods model used for this study's research design.

4.3.1 Mixed methods research

Mixed methods research is 'research in which the investigator collects and analyses data, integrates the findings and draws inferences from both qualitative and quantitative approaches' (Tashakkori & Cresswell, 2007:4). It is therefore characterised by its use of both qualitative and quantitative components in the research process (Schoonenboom & Burke Johnson, 2017).

There are several advantages attributed to this approach. Mixed methods research offers opportunities to gain a more holistic and comprehensive understanding of the topic being researched, an understanding not always possible through strictly quantitative or qualitative approaches (Shannon-Baker, 2016). The reliability associated with mixed methods research is also an advantage (Fetters et al., 2013; McKim, 2017). Qualitative data can be used to verify quantitative findings and refine quantitative data gathering instruments, while quantitative data supports sample generation and can be used to provide a context for qualitative findings (Fetters et al., 2013). These characteristics add confidence in the results and conclusions of a mixed methods study.

However, there are also challenges associated with mixed methods approaches. Mixed methods designs can be quite labour-intensive. Data gathering and analysis stages may require more researcher time than a single method. Consequently, mixed method studies require more financial support. Studies of this nature also require the researcher to be competent with handling both qualitative and quantitative data sets, which is not a skill that all

researchers inherently possess. This may result in errors or a lack of confidence in findings. Furthermore, mixed methods studies can encounter issues when it comes to publication. Word counts imposed by publishers pose a challenge for the researcher to edit their work without losing key details of their methodology (Whitley et al., 2020).

While these challenges were kept in mind when planning the research design for this study, none were seen as posing challenges to such an extent that this study was deemed unachievable.

4.3.2 A sequential research design

Different models of mixed methods research exist (Burke-Johnson et al., 2007). For this study, I chose a self-imposed variation of the model described by Morse (2015). Morse (2015) describes a mixed methods design of two parts. The first is known as the core component, and the second is known as the supplemental component.

According to Morse, the core component should be capable of acting independently of the supplemental component. It has its own set of methods, data gathering tools, and sets the theoretical base of the study by determining whether the study is inductive or deductive in its approach. Due to its importance in a study, it is recommended that the core component be implemented rigorously (Schoonenboom & Burke Johnson, 2017). The second part, the supplemental component, enhances the findings from the

core component by providing additional context and validation. In this sense, the supplemental component is not the primary focus of a study.

Considering the tensions I have identified within the field, I found the prospect of qualitative and quantitative findings from different stages of the research process feeding into each other to be very appealing. It models a process whereby knowledge is shared and strengthened by drawing upon different types of data, showing that the creation of cross-sector knowledge between planning, public health, and education is possible. However, Morse advocates that either a quantitative or qualitative paradigm must be dominant in mixed methods research. This is because the core component is expected to drive the study, and the paradigm associated with the core component sets the direction, or theoretical drive, of the research. The thought of elevating one method over another was not agreeable to me. Due to the exploratory nature of this study and the identified need to 'speak the language' of a range of research fields, I deemed it necessary that both qualitative and quantitative paradigms were given equal status. In a divergence from the model described by Morse, I consider both components of my research design to be of equal value.

In this sense, what is traditionally known as the 'core component' will henceforth be referred to as 'Phase One' of this study, while the 'supplementary component' will be referred to as 'Phase Two'. This change in terminology describes the sequence in which both phases occurred, while eliminating any hierarchy.

My decision to adopt a non-hierarchical research design is supported by Brannen (2005) who identifies sequential designs of equal dominance as a valid form of mixed methods research. Drawing on the example of Hammond (2005), Brannen argues that such designs are particularly appropriate in under-researched fields. In these contexts, the first data collection phase functions as a contextualising and exploratory exercise and enables a more nuanced understanding of the research area. This, in turn, informs the design and focus of the subsequent phase of the study. Given the limited scholarship identified in the literature, this rationale provides a clear methodological justification for a non-hierarchical sequential design in the present study.

Morse (2015) advocates for specific details of a research design to be presented when writing a methodology section. These details will now be discussed in consideration of my adjustments to the model.

4.3.2.1 Theoretical drive

Thierbach et al. (2020) assert that a general principle of social research is that research questions influence the type of methods chosen by the researcher. As the research questions for this study seek to engage with adolescents to explore whether there are links between the distribution of open space, adolescents' subjective wellbeing, and area-based measures of relative deprivation, this study draws upon both qualitative and quantitative methods.

4.3.2.2 Phase One

Phase One of this study is both qualitative and quantitative in approach. It aligns with the first data gathering phase of this study. Primary data was gathered through a series of data gathering workshops taking place in Scottish secondary schools. The data gathered through this phase were used to answer Research Question 1 and Research Question 2. This data was also used to inform the steps taken when gathering data during Phase Two.

4.3.2.3 Phase Two

Phase Two of this study is quantitative and spatial in approach. It aligns with this study's second data gathering period. Once Phase One yielded information on the types of open spaces used most frequently by adolescents, this information was used to assess their spatial distribution and identify any relationships between patterns of distribution and patterns of area-based measures of relative deprivation. This provided answers to Research Question 3 and Research Question 4.

4.3.2.4 Pacing and point of interface/integration

The point of interface/integration for my qualitative and quantitative data sets occurred at the study design level. The sequential design I used for this study closely aligns with Schoonenboom and Burke-Johnson (2017:114) where 'the data collection and data analysis of one component takes place after the data collection and data analysis of the other component and depends on the

outcomes of the other component'. In my study, Phase Two needed to take place after Phase One. This is because the geospatial data gathering performed in Phase Two was informed directly by the findings of Phase One. Once this was completed, the patterns identified through the geospatial analysis were used to contextualise and interpret the data derived from Phase One. In this sense, the findings of each component build upon the findings of the other (Fetters et al., 2013).

4.4 Participants and sampling

To work with large cohorts of adolescents, I decided to conduct data gathering workshops in Scottish secondary schools. I used the term 'data gathering workshops' to best fit my role as an external partner working with young people in school during the school day. Secondary schools in Scotland are managed on a local authority level and have designated catchments within a local authority boundary. Planning is also handled at a local level and shares these boundaries, in most cases. This dual role of the local authority was convenient for the purposes of this research.

4.4.1 Characteristics of participants

The population of focus for this study were adolescents aged 12- to 15-years-old attending school in urban areas. This age group aligns with the initial years of secondary school in Scotland and was chosen due to their

underrepresentation in literature relating to open space, health, and wellbeing in Scotland, as highlighted in my Literature Review.

In Scotland, young people gain the right to vote in local government elections at 16 years-of-age. This makes the relationship that my population of focus shares with open spaces, and the extent to which they can voice their opinion on local policy decisions, distinct to that of older adolescents. This means that my age group of interest are characterised by being more likely to move independently in their neighbourhoods than younger children without the ability to have a say in how they are represented locally. Adolescents attending school in urban areas were chosen as the focus of this study due to unique access to a variety of open spaces and their ability to self-mobilise, in comparison to rural adolescents.

4.4.2 Research access and study area

This study draws upon the *Scottish Government Urban Classification 2020* (Scottish Government, 2022) definition of ‘urban’. I decided to include both Large Urban Areas and Other Urban Areas in this study due to their shared characteristics of high population densities and associated urban infrastructure.

To determine which Large Urban Areas and Other Urban Areas formed my study area, the sites for data gathering, and the pool from which I drew my sample, I took a systematic approach. Firstly, I compiled a list of the fifty largest urban areas in Scotland by population, as population is the measure used to

distinguish urbanity in the Scottish Government Urban Classification 2020 (Scottish Government, 2022). From this, I created a list of the 16 local authorities that contained these urban areas. Research activity taking place in schools is managed by local authorities in Scotland. As such, I contacted each authority on this list to seek possession of research access documentation.

For those who responded to my request positively, I submitted a completed research access form along with copies of my data gathering tools (Appendix A1, A2, Figure 4,4), participant information sheets (Appendix B), and my Disclosure Scotland certificate.

Seven local authorities granted approval. Following this, I compiled a list of eligible schools in each local authority using the *2022 Scottish Government School Roll* (Scottish Government, 2023f). All secondary schools classified as being in an Other Urban Area or a Large Urban Area in each local authority that granted approval were added to the list. These schools were first contacted by email and then by letter if the email yielded no response. The email and letter included an introduction to me as the researcher, a description of the study and its research questions, confirmation that I had gained consent from the local authority to contact them, participant information sheets, and data gathering worksheets.

Through this process, three schools accepted the invitation to participate in this study – one in the Highland Council, one in North Lanarkshire Council, and one in West Lothian Council. The urban areas within these authorities became known as my ‘study area’. These schools became the sites of the data

gathering workshops conducted as part of Phase One of this study, the young people aged between 12 – 15-years-old who attended these schools became the pool from which I drew my sample for this data gathering phase, and the study area became the focus of the geospatial analysis conducted as part of Phase Two of this study.

This study is distinguished from others in the field by the participation of these three local authorities, deviating from the Edinburgh and Glasgow-centric focus of the literature base. In addition to this, each participating authority has distinct characteristics that ensure a well-rounded representation of urban Scotland:

The Highland Council is Scotland's largest but most sparsely populated local authority. It is also one of the least urbanised authorities in Scotland and the only authority in this study that features a Large Urban Area with city status, Inverness. The inclusion of this authority allows for the urban environments of northern Scotland to be represented in this research.

North Lanarkshire Council is part of the 'West of Scotland'. It is the only authority in this study that contains a Large Urban Area that is a town, Motherwell. As one of Scotland's most urbanised local authorities, it contains several large towns classified as Other Urban Areas that are near each other such as Coatbridge and Airdrie, representing the type of urban sprawl associated with highly urbanised areas.

West Lothian Council is part of the 'East of Scotland' and the Lothians region. It is the only participating authority where all urban areas are classified as

Other Urban Areas. West Lothian is notable as it features the newest town in this research, Livingston, which was designated a new town in 1962. Incidentally, it is also Scotland's third largest town, and the largest town by size and population included in this study.

4.4.3 Sample selection

Each local authority contained one participating school. Schools were invited, first by email and then by letter, to take part if they met specific criteria: They were located within a local authority that granted research access, situated within either a Large Urban Area or an Other Urban Area, and enrolled pupils aged 12 – 15 years.

The reasons for schools' participation are not known. However, several reasons are plausible based on my own experience working in and with Scottish secondary schools. It is possible that this study's focus on health and wellbeing resonated with current school priorities for some schools. For others, this research may have presented an opportunity to learn more about how young people engage in the local community or reflected an interest in developing a relationship with a new external partner, which would have been the University in this case. It is also possible that some schools valued research in education and wanted to support activities related to this. Despite these speculations, the reasons why these schools chose to participate are nonetheless unknown.

The contexts of these schools are broadly similar, allowing for data generated from their respective samples to be generalisable. At least 80% of the young people attending each school lived in an urban area of some form. For those living in rural settings, it can be argued that their commute to school and the time they spend in the school grounds and surrounding areas form the basis of a blended urban-rural experience. This experience is created through daily exposure to urban built environments and potential access to urban resources, such as open spaces, during this time.

The Scottish Index of Multiple Deprivation (SIMD) is used as a spatial measure of relative deprivation in this study due to its use as a common framework by policymakers, state agencies, and researchers across fields/sectors. Similarities are also observed between the socioeconomic contexts of each setting, with representation of each SIMD Quintile found within each catchment. However, some have stronger representation than others, as shown in Figure 4.1. Due to ethical considerations, it was not possible for me to assess the extent to which each SIMD Quintile is represented in my sample. However, any influence that socioeconomic context may have on the findings from each sample will be considered during analysis.

Table 4.1

Table of SIMD Quintiles associated with the catchments of the three participating secondary schools (Scottish Government, 2023h)

Local Authority	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	SIMD Unknown
The Highland Council School	0 - 10%	0 - 10%	10 - 20%	40 – 50%	10 – 20%	0 – 10%
West Lothian Council School	0 – 10%	30 – 40%	10 – 20%	30 – 40%	10 – 20%	0 – 10%
North Lanarkshire Council School	50 – 60%	10 – 20%	0 – 10%	10 – 20%	0 – 10%	0 – 10%

Not all young people in each school participated in this study. A self-selected convenience sample from each participating school was taken. A convenience sample was chosen due to the practical constraints associated with gaining permission for data gathering in school settings. In total, 594 adolescents participated in this research, and the total number of participants from each school is shared in Table 4.2 below. The sample was heterogeneous and comprised of participants of different ages, genders, and geographic locations. This heterogeneity increases the generalisability of my findings.

Table 4.2

The total population sample from each participating secondary school and the total sample of participants in this study

Participating School	Sample
The Highland Council school	105
North Lanarkshire Council school	234
West Lothian Council school	255
Total Sample	594

For each school that expressed interest in participating in the study, I met with a member of the school's leadership team. This meeting intended to introduce myself and the study to the school in person and to answer any questions the school may have. The desired outcome of each meeting was to establish dates and a format for data gathering. The data gathering process is described in the next section.

4.5 Data gathering

In line with my sequential research design, data gathering was completed in two phases. Phase One consisted of the collection of primary quantitative and qualitative data. This was achieved through in-person data gathering workshops. During these workshops, participants shared their experiences with open spaces, including the activities and characteristics they observed during their visits, and discussed whether they associated these experiences with their health and wellbeing. Phase Two used data collected during Phase One in addition to secondary open-access data sets produced by the Scottish Government to conduct a geospatial analysis of the open spaces of most significance to adolescents. During this, the distribution patterns of the types open spaces most visited by participants were identified, and the extent to which they are accessible between areas of relative deprivation was determined.

In the subsequent sub-sections, each data gathering phase will be described in detail.

4.5.1 Phase One: Data gathering workshops

The aim of Phase One was to gather data on how adolescents aged 12- to 15-years-of-age used open spaces and whether they related their use of open spaces to their subjective health and wellbeing. To fulfil this aim, participants took part in a data gathering workshop held in their school. During these workshops participants used a series of A3 worksheets that featured three activities: a mobility map, a body map, and a list of *Health & Wellbeing Experiences & Outcomes*. These activities were the research tools for this phase.

All workshops were organised in a similar way. Once research access had been granted by a school, I organised to have a meeting with a key contact in each setting. The aim of this meeting was to introduce the research, answer any questions the school might have, and to organise dates for the workshops to occur.

Data gathering workshops took place between January and March 2024. Although the workshops took place in different school contexts, the key components of the workshops remained consistent across each participating school. In each workshop, I introduced myself, the study, the aims of the study, and the tasks the participants would be doing. I also reminded the participants of their rights. Each workshop used the same PowerPoint presentation to support this work. Each workshop was delivered within a 50-minute timeframe, which is the length of a standard lesson period in Scotland. The normal class teacher was present during each workshop to supervise, as were any other

adults that provided support for learning. This ensured that all participants were in a position to fully take part in the workshops.

Once introductions were completed, I distributed the activity worksheets (sometimes with the assistance of other adults in the room) and then stood at the top of the room to introduce the first activity. Using an approach akin to 'teacher modelling' or 'explicit instruction', I held up the first A3 worksheet for the participants to see, ensuring that everyone was on the correct page, and explained the activity by talking through what participants were being asked to do. Following this, participants were given the opportunity to ask questions or seek clarification. Then, they were invited to engage in the activity.

While participants worked, I moved around the room slowly to allow further opportunities for participants to ask questions or seek further clarification. While circling the room, I took the opportunity to assess when it would be appropriate to introduce the second activity. I then repeated this process until it was time to introduce the third activity. At the end of the session, participants were invited to place their worksheets into one of two piles. One pile was for participants who were still happy for their data to be used in the research. The second pile was for participants who completed the activities but no longer wanted their data to be used.

The three activities completed by participants will now be discussed in detail.

4.5.1.1 The mobility map

The first activity was a mobility map. Mapping, a visual method of data gathering, is a useful way of examining how young people represent and relate to the world around them (Futch & Fine, 2014). For this activity I replicated the successful use of mobility or community mapping in other studies. I used the mobility map as a basis for subsequent data gathering activities (Mmari et al., 2014), allowed participants freedom in how they structured their maps (Trell & Van Hoven, 2010) by allowing them to write or draw responses, and ensured equitable participation during the activity (Travlou et al., 2008) by utilising pre-existing classroom supports.

This tool was chosen to gather data on the types of open spaces, as defined by *PAN 65*, that participants visit and the characteristics of these visits (Research Question 1). While this information could be gained through more conventional means, such as via the distribution of a questionnaire survey, there are several reasons why I believe that a mobility map was the most appropriate tool to answer this research question. Firstly, mobility mapping is a highly flexible tool that allows for adaptation to suit the needs of all participants and settings. It also allows participants to be as open or as closed with their responses as they feel comfortable with.

Each participant was provided with an A3 sheet of paper with an image of a building in the centre (Figure 4.1). This image represented their home. Participants were also provided with an A4 'Open Space Handout' (Figure 4.2) to support them in completing this activity. This A4 handout featured photographs of 11 different kinds of open space – one for each of the

classifications of open space listed in *PAN 65* (Scottish Government, 2008). Photographs used in this handout were sourced from Geograph, a project which aims to collect geographically representative photographs and information for every square kilometre of Great Britain and Ireland (Geograph, 2024). Images were sourced by searching each classification and choosing a representative image from the photographs yielded in each search. The photographs were intentionally selected from areas that were not included in the study to remove any element of familiarity bias that the participants may encounter.

Participants added the types of open space they visited to their A3 worksheet, typically by drawing a line between the number assigned to their chosen open space and the image of the house in the centre of the page. This line represented the distance between the open space and their home. The participants then typically drew additional lines that radiated from each of the open spaces and added the following information: the distance between the open space and their home in minutes, the mode of transport they take to get there, the activities they engage with when there, the length of time they spend there and how frequently they visit there. This information identified the types of open spaces they visit, accounted for the characteristics associated with their visits to open spaces and recorded the activities they perform in each space.

Participants were free to include as many places as they wished and multiples if it reflected their actions. In instances where participants wanted to include spaces that did not exist on the taxonomy or, ones they believed were not

represented by the taxonomy. These spaces were recorded as '11 – Other Green Spaces' and the participant added additional details or descriptions of these spaces.

Figure 4.1

Completed A3 mobility map used by a participant during data gathering workshops

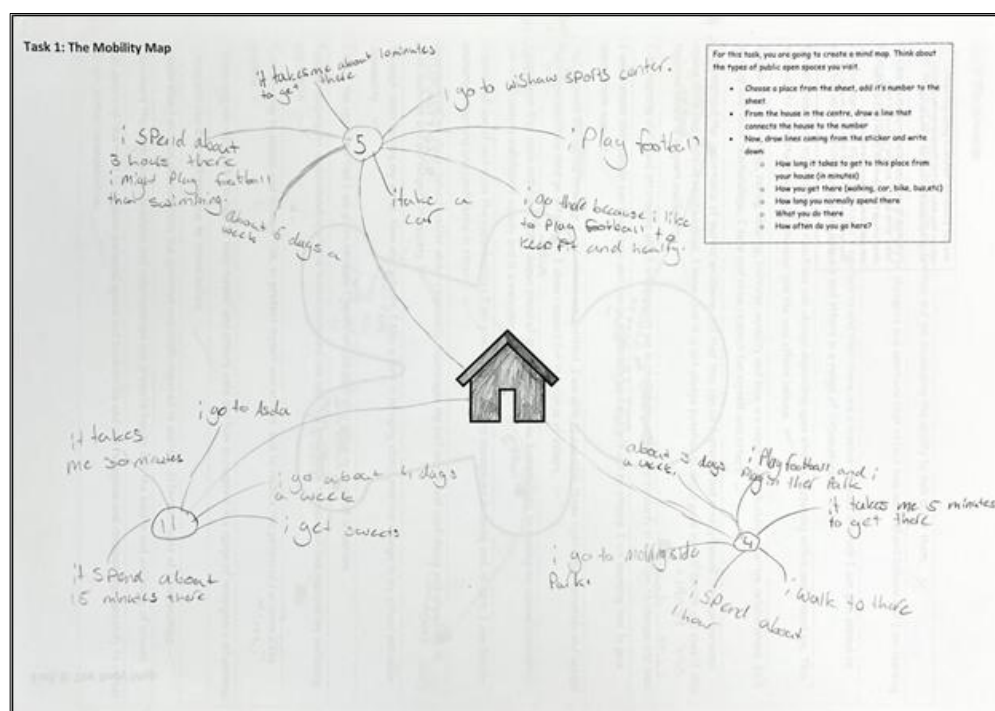


Figure 4.2

Open space handout used by participants during the data gathering workshops (Geograph, 2024)



Note. (Photo © Copyright [Thomas Nugent](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence; Photo © Copyright [Jim Barton](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence.; Photo © Copyright [Chris Upson](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence; Photo © Copyright [Jim G](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence. ; Photo © Copyright [M J Richardson](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence.; Photo © Copyright [Rod Allday](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence.; Photo © Copyright [Richard Sutcliffe](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence.; Photo © Copyright [Stanley Howe](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence.; Photo © Copyright [edward mcmaihin](#) and licensed for reuse under a [cc-by-sa/2.0](#) Creative Commons Licence.)

4.5.1.2 The body map

This tool was adapted from an activity known as 'X-ray Mapping' used in Petteway et al. (2019). I adopted this tool to identify how certain features or experiences in open spaces influence participants' feelings in these spaces,

thereby providing data to inform an answer to Research Question 2. I took the limitations associated with this method into account. Wilkinson (2000) outlines that not all young people are comfortable with drawing, or they may perceive the activity as childish. There is also the risk that researchers may misinterpret participants' drawings. These issues were mitigated through the inclusion of written elements and framing the activity as an extension of the mobility map.

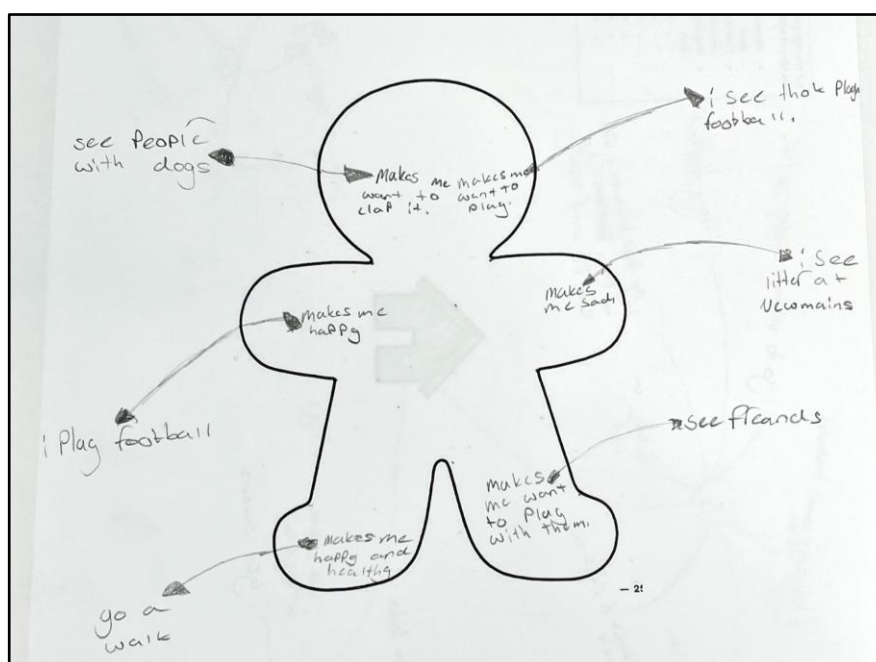
Each participant had an A3 sheet with the shape of a large blank 'gingerbread person' in the middle of it (Figure 4.3). Thinking of the open spaces they represented on their mobility maps, the participants were asked to write or draw the 'things they see and do' i.e. physical features (such as trees, litter, joggers) and concepts (such as play, hanging out) they associate with these open spaces around the outside of the 'gingerbread person' shape. Then, inside the 'gingerbread person' shape, they wrote down the feelings or thoughts they have about these features. Thoughts and feelings were then connected by a line to the feature that evoked them.

While this activity provided data to inform an answer to Research Question 2, the body maps also served as a bridging activity between the first and third activity. The body maps were introduced to participants as being connected to the mobility map. They were asked to complete their body maps by reflecting upon the open spaces the mentioned in their mobility maps. In addition, by aligning their experiences in open spaces with their feelings and emotions, the body maps also worked to prepare participants for the third activity which was focused on *Health and Wellbeing* outcomes. In this sense, there was a logical progression between the activities when completed in succession. Participants

moved from thinking about a concrete experience, to relating it to their emotions, to then reflecting upon whether these experiences and how they feel about them relate to their health and wellbeing.

Figure 4.3

An example of an A3 body map completed by a participant



4.5.1.3 Experiences and outcomes

To fully answer Research Question 2, I needed to develop a data gathering activity that engaged with health and wellbeing outcomes in some form. I decided to use the outcomes that form part of the *Health and Wellbeing Across Learning Experiences and Outcomes* (Es & Os) from the *Broad General Education* phase of the *Curriculum for Excellence* (Education Scotland, 2010a). There are a number of practical reasons that support this decision. Firstly, the Es & Os are written in the first person, from the point of view of a

young person. This characteristic suggests that they are accessible to the participants, supporting their use as a self-reporting health and wellbeing measure in this study.

Secondly, I had reason to believe that the participants would be familiar with the language used in the Es & Os. From my experience as a classroom teacher, I knew it was common for teachers to be required to include comments on literacy, numeracy, and health and wellbeing in school reports sent home to parents/guardians/carers. The language used and the curricular levels stated in the Es & Os are used by teachers to inform these comments. In Scotland, there is an expectation for young people to be aware of what BGE level that are currently working at and what they need to do to achieve the next level i.e. a student currently working at level 3 of the BGE would be expected to aim towards working at level 4, be aware of this aim, and be supported by their teacher to achieve it. This is supported through conducting 'learner conversations' which are discussions between a teacher and a young person about what they are currently learning, their strengths, areas for development, and next steps. In this sense, although the Es & Os are operational guidance documents for teachers, their language is commonplace in classroom contexts and regularly encountered by young people. In addition to these practical considerations, based on my reading, I found that the structure of the *Health and Wellbeing* Es & Os suitably reflected the multifaceted nature of health and wellbeing as a concept as they go beyond stating outcomes for physical health and include outcomes related to social, emotion, and mental wellbeing.

Participants were provided with an A3 list of 21 Es & Os (Figure 4.4). While reading through the list, participants highlighted or put a 'tick' mark beside the outcomes they associated with being in the open spaces they had previously indicated on their mobility maps and reflected upon in their body maps. The *Health and Wellbeing* Es & Os are divided into four categories: *Mental and Emotional Wellbeing*, *Social Wellbeing*, *Physical Wellbeing* and *Relationships*. By reviewing the selections made by participants, I intended to reveal the extent to which they associated these areas of wellbeing with open spaces, allowing for an answer to Research Question 2 to be determined.

Figure 4.4

Photograph of the Experiences and Outcomes Activity work sheet

Task 3: The Es and Os

I am aware of and able to express my feelings and am developing the ability to talk about them.
I know that we all experience a variety of thoughts and emotions that effect how we feel and behave and I am learning ways of managing them.
I understand that there are people I can talk to and that there are a number of ways in which I can gain access to practical and emotional support to help me and others in a range of circumstances.
I understand that my feelings and reactions can change depending upon what is happening within and around me. This helps me to understand my own behaviour and the way others behave.
I know that friendship, caring, sharing, fairness, equality and love are important in building positive relationships. As I develop and value relationships, I care and show respect for myself and others.
I understand the importance of mental wellbeing and that this can be fostered and strengthened through personal coping skills and positive relationships. I know that it is not always possible to enjoy good mental health and that if this happens there is support available.
I am learning skills and strategies which will support me in challenging times, particularly in relation to change and loss.
I understand that people can feel alone and can be misunderstood and left out by others. I am learning how to give appropriate support.
As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others.
I recognise that each individual has a unique blend of abilities and needs. I contribute to making my school community one which values individuals equally and is a welcoming place for all
I make full use of and value the opportunities I am given to improve and manage my learning and, in turn, I can help to encourage learning and confidence in others.
Representing my class, school and/or wider community encourages my self-worth and confidence and allows me to contribute to and participate in society.
Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community.
I value the opportunities I am given to make friends and be part of a group in range of situations
I am developing my understanding of the human body and can use this knowledge to maintain and improve my wellbeing and health
I am learning to assess and manage risk, to protect myself and others, and to reduce the potential for harm when possible
I know and can demonstrate how to keep myself and others safe and how to respond in a range of emergency situations
I know and can demonstrate how to travel safely
I understand and can demonstrate the qualities and skills required to sustain different types of relationships
I am aware that positive friendships and relationships can promote health and the health and wellbeing of others
I am aware of the need to respect personal space and boundaries and can recognise and respond appropriately to verbal and non-verbal communication.

4.5.2 Phase Two: Exploratory geospatial analysis

For Phase Two of this study, I created a series of descriptive choropleth maps (ERSI, 2023a), which allowed for responses gathered through the mobility map tool to be represented spatially. ArcGIS Online was used to conduct the following process, which is represented visually in the flow diagram in Figure 4.5.

First, I created three new map layers. Each layer featured the boundaries of a participating local authority. These were created using an open-source layer produced and shared by the Environmental Protection Agency on ArcGIS Open Atlas (Seggie, 2025). Following this, I located the Large Urban Areas and Other Urban Areas included in this study by using the Scottish Government's Urban-Rural Classification polygon layer (Scottish Government, 2021). The Scottish Government publishes this layer, and I accessed it through ArcGIS Open Atlas. I traced each urban area to create new polygons on my map layers. In total, 14 urban areas were included. In subsequent chapters, to limit confusion with the word 'area' as a measurement of surface area, these 14 urban areas will be referred to as 'urban units'.

The mobility map tool identified the types of open spaces of greatest relevance to adolescents, and these became the focus of the exploratory geospatial analysis. I sourced open space data for each local authority through the Ordnance Survey Open Greenspace dataset (Ordnance Survey, 2022). I cross-referenced this information with local authority open space audits, open space plans, and open space strategies, where available. In instances where data was not available, Google Street View was used to identify the locations

of these open spaces in tandem with hybrid topographic base maps, in alignment with practice in the field (Boyes et al., 2023).

I created four new map layers for each local authority, one for each type of open space of focus at this point of the study. I traced and created polygons for all open spaces I found within my study area. I created separate map layers for each open space, allowing them to be hidden or highlighted independently on the map. This allowed for individual layers to be hidden or overlayed as and when necessary for spatial analysis.

Once my different map layers had been created and populated, I sourced Scottish Index of Multiple Deprivation (SIMD) data as an area-based measure of relative deprivation and added it as an individual map layer (Scottish Government, 2021). This data set was also open source, produced by the Scottish Government and accessed via ArcGIS Open Atlas. I then overlaid the SIMD data layer on top of the individual open space layers.

Through mobility maps, I was able to identify the distance that participants travel by foot to get to the open spaces of focus. I calculated the median distance travelled to each type of open space, and I used this figure to inform the creation of 'walkability buffers'. I applied these buffers around each open space polygon. The width of each buffer represented the typical walking distance an adolescent would walk to access that type of open space.

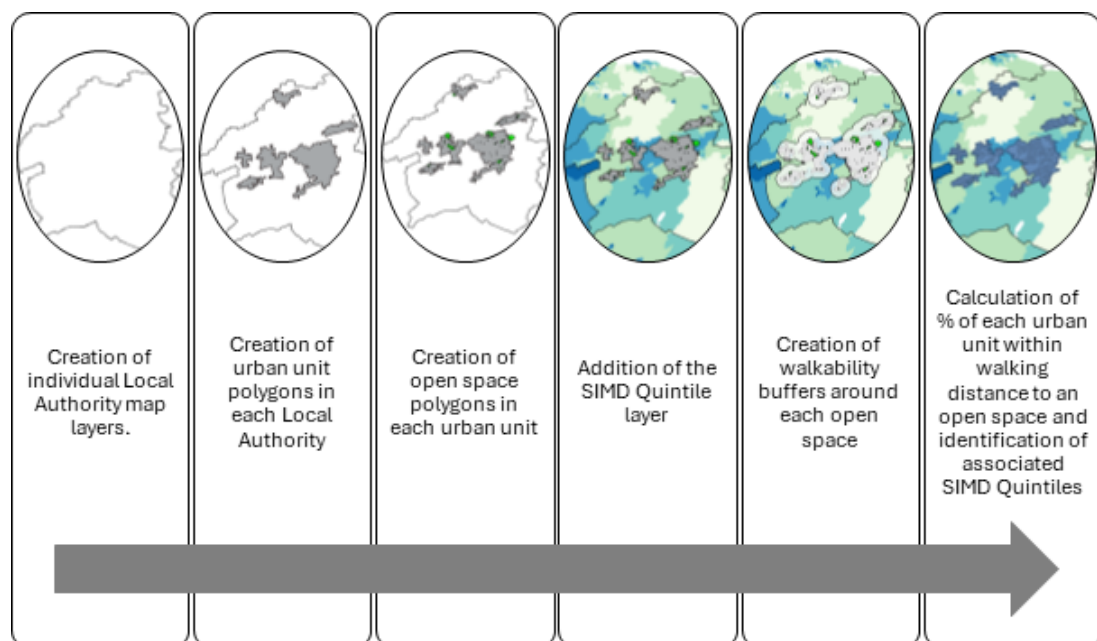
The distances provided by adolescents in the mobility map were expressed in minutes. Therefore, it was necessary to convert this time into a physical distance for the buffer to be created. Following a review of literature relating to

adolescent walking distances, I decided to use a guide of 80 metres per minute, i.e. if the median walking distance was five minutes, this translated to a distance of 400 metres (UNICEF, 2018; Chillon et al., 2014; Colabianchi et al., 2007; Boone et al., 2009; Villanueva et al., 2012).

After applying these buffers, my geospatial data was ready for analysis.

Figure 4.5

Flow diagram describing the processes conducted as part of the geospatial analysis



Note. The images in the flow diagram use Sports Areas in West Lothian as an example. (Adapted from: Ordnance Survey (2022), OS data © Crown copyright and database right 2022; Scottish Government (2021), copyright Scottish Government, contains Ordnance Survey data © Crown copyright and database right (2021); Scottish Government (2021), copyright Scottish Government, contains Ordnance Survey data © Crown copyright and database right (2021); and Seggie (2025)).

The tools I used in this study were innovative and complex. As such, there were several ethical considerations that needed to be made. These are

discussed in the next section, starting with a reflection upon my role as a researcher.

4.6 Ethical considerations

For all studies involving human participants, several ethical considerations and guidelines must be considered. This section describes the main ethical issues identified in this study and how they were addressed. This study adhered to the British Educational Research Association's (BERA, 2018) and British Psychological Society's (2021) ethical guidelines and was approved by the Strathclyde Institute of Education Ethics Committee. The main ethical issues associated with this project related to confidentiality, anonymity and informed consent. These issues and how I addressed them are described in the subsequent sub-sections.

4.6.1 The role of the researcher

My role as a teaching fellow in the Strathclyde Institute of Education requires me to conduct regular visits to partner schools to observe and assess student teachers on placement. Because of this, I was mindful that some participating schools could have a pre-existing relationship with me through this role. In instances where this was the case, it was reiterated that participation in the study was voluntary. This pre-existing relationship was not used to influence schools' participation in any way.

When working with young people and delivering data gathering workshops, I was mindful that, in that moment, I may have been seen by participants as 'the teacher'. This was particularly applicable during workshops conducted during timetabled school lessons. I was mindful that this may influence how participants act and respond to activities – they may have felt pressure to provide the 'correct' answer or provide responses that they thought I wanted to read. I was mindful that this scenario may also influence my interactions with the participants, slipping into 'teacher mode'. To mitigate this, I was addressed by my first name during data gathering workshops instead of the title of 'sir', which is commonly used in Scottish schools to address teachers. I also adopted a critically reflexive practice during each workshop to maintain an awareness and subjective understanding of my assumptions and how they impact my actions.

This reflexive approach to research is advocated by Thomson and Gunter (2011) who emphasise the fluidity of the researcher's positionality within institutional settings. Reflecting upon experiences with school-based research, Thomson and Gunter (2011) highlight how researchers may move between 'outsider' and 'insider' roles depending on context and interaction. Such shifts are shaped through ongoing engagement with leadership, staff, and pupils.

In my experience as a researcher and former teacher working in a school context, I observed a shifting dynamic in my position during the first data gathering phase. These shifting positions influenced how I related to participants and required me to remain attentive to the ways in which my presence shaped our interactions. My initial meetings with key contacts in each

school were as an outsider. I was a researcher with no prior connection to the school. The visitor's lanyard I wore and my introduction to participants as a 'guest' or 'visitor from the university' at the beginning of data gathering workshops reinforced this external position. However, I also recognise that, due to my background as a secondary school teacher, some of the teachers I worked with may have positioned me as a colleague of sorts or as a fellow educator. In these instances, I was perhaps seen as a collaborator by the teachers and support staff that observed and assisted participants during the data gathering workshops.

Furthermore, conducting my research during the school day required adherence to school protocols and this further embedded me into the school's operational systems. In schools where I gathered data over a period of several weeks, I grew more familiar with the school environment. I soon came to interact with school office staff on a first-name basis and became acquainted with the school's ethos. This further contributed to an insider positionality. However, for my participants, who I only ever worked with once, my introduction as a guest and the use of my first name ensured that I was perceived by them as an outsider. As such, my position as an insider/outsider was constantly shifting and adapting depending on the contexts of my interactions with others within the school setting.

4.6.2 Working with young people

As this study aimed to engage with participants across multiple local authorities, I was mindful that different local authorities may have different procedures by which they required me to gain consent from the young people in their care. The logistical requirements of participating schools also influenced the method used. Therefore, when approaching local authorities and individual schools, both 'opt in' and 'opt out' pathways were provided for gaining informed consent from young people.

The research design aimed to deliver data gathering workshops with large cohorts of young people (for context, a class set in Scottish secondary schools can consist of approximately 30 young people) in a single lesson period (50 minutes approximately). I was cautious that for some participating schools, due to staffing, rooming, or timetable constraints, it may not be possible to have participants leave their timetabled class to work with me in another area of the school. Likewise, there may not be staff cover available to supervise non-participants while I work with the rest of the group. For settings such as these, an 'opt out' pathway was preferable.

The 'opt out' pathway saw young people receiving two separate Participant Information Sheets. One sheet was written in a young person-friendly format with explanations of the project and featured a slip for the young people to sign and return to the key contact in each school if they wished to opt out of the project. The second Participant Information Sheet was for the young person's parent/carer/guardian. This also outlined the aims and activities associated with the project as a slip for the adult to sign and return if they wished for their

young person not to participate in the project. The return of either slip indicated a decision to opt-out of the study.

At the beginning of each data gathering workshop, participants were once again introduced to the aims and objectives of the study, what their data would be used for, how it would be stored and how they could access the results. At the end of this introduction, participants were reminded that they could choose to no longer participate in the study at any time by simply speaking to me or a staff member. These young people would still participate in the workshop activities because they are linked to Broad General Education Phase Experiences & Outcomes, and therefore, provide valid educational experiences related to their curriculum. However, these participants' worksheets would not be collected at the end of each session.

The 'opt-in' pathway saw the young person receive two separate Participation Information Sheets. One was written in a young person-friendly format and had written explanations for the project. The second sheet was for the young person's parent/carer/guardian and outlined the aims and activities associated with the project. It also included a slip for both adults and young people to co-sign and return to the key contact if they wish to participate in the project.

All three participating schools decided to use the 'opt-out' pathway.

4.6.3 Workshop activities

To ensure anonymity, the mobility map did not require young people to feature any identifiers such as their name, age, address, SIMD Quintile or the names

of specific places. The use of taxonomy numbers as representations of open spaces in the A4 handout mitigated the likelihood of participants writing names or placenames as identifiers.

When completing the body map, participants were advised that they did not have to disclose any information that they did not wish to disclose, such as details of traumatic incidents that occurred in the open spaces they visit. If information of this nature had been disclosed, individual school procedures would have been followed.

As the Es & Os indicate progression in children's learning in curricular areas, the activity involving the *Health and Wellbeing* Es & Os did not pose any ethical concerns.

Concerning maintaining confidentiality, all hard copies of completed activities were scanned and stored electronically in a password-protected folder on a University of Strathclyde OneDrive account. Only the research team had access. A Data Management Plan was created and followed accordingly. All data gathered and all visual representations created as part of this study will be stored for ten years after the completion of the study, following University of Strathclyde guidelines.

4.6.4 Geographic information systems

The data used in the geospatial analysis was drawn from open-source databases, abiding by terms of use. No confidential information about participants was represented in the maps I made. Maps were created on a

University of Strathclyde staff laptop using a University of Strathclyde subscription to ArcGIS. Maps were not made publicly available via Living Atlas or ArcGIS Online for others to access. The only people with access to these were the researchers. The British Cartographic Society code of ethics was followed during this process (2020).

4.7 Tools of analysis

Due to this study having multiple phases of data gathering and due to both quantitative and qualitative data being gathered at various stages, different tools of analysis were needed at various stages. In this section, the tools of analysis I used at each phase are described.

4.7.1 Tools used in Phase One

4.7.1.1 Quantitative Data

Phase One of the study generated quantitative and qualitative data. I processed the quantitative data gathered through the mobility map and the Es & Os activity using the desktop version of IBM SPSS Statistics (SPSS). Using the workshop worksheet as a guide, I created sets of variables and codes before I entered any data into SPSS. An example of some of these variables and codes is shared in Appendix C. I then worked from scanned worksheets to input the data. It is important to note that some of the data collected through the mobility map was mixed data. Therefore, some qualitative responses

provided by respondents, such as 'hang out with friends' and 'sometimes go to parks for parties', needed to be transformed to be coded. I coded the data from the Es & Os activity by converting responses into a binary format (1 to represent 'yes', 0 to represent 'no').

Once all data had been inputted, I calculated univariate statistics through SPSS. For Es & Os data, further analysis was taken. I used a chi-square test to assess whether there was a significant association between whether a participant visited an open space and whether they achieved all or no health and wellbeing outcomes.

Additive scores were calculated to assess each category of *Health and Wellbeing*, and the relative risk ratio between scores was calculated. An independent sample t-test was used to compare mean scores. I also used a series of Pearson's correlation coefficients to identify correlations between the number of *Health and Wellbeing* Es & Os met and the number of open spaces visited.

4.7.1.2 Qualitative Data

The body map activity produced qualitative data. This was analysed through a reflexive inductive thematic analysis (Braun & Clarke, 2019). This process was completed by hand using scanned images of body maps and coding them inductively. An example of my coding process is featured in Appendix D. The first step of this analysis involved becoming familiar with the data. Familiarisation began by scanning the worksheets on which participants

completed the body map activity. I read each individual worksheet, photographed it, and then uploaded the images to a secure OneDrive folder over a four-day period. A week later, I revisited each scan to re-read the data. During this second reading I took notes to help identify any patterns. Since the body maps contained both words and drawings, this step also allowed me to make sense of the drawings by using the contextual clues provided by the rest of the data on the sheet e.g. a drawing of a pitch with markings was understood to be a football pitch because the participant had also drawn a football kit on their gingerbread person.

Figure 4.6

Example of contextual clues in worksheets (a gingerbread person wearing a football kit and football boots) providing meaning to an image (a football pitch).



This was followed by an initial coding exercise. The initial codes consisted of the positive, negative, and neutral emotions mentioned in the body maps. These codes were generated inductively from the data. After generating these codes, I looked for patterns within them and grouped them into overarching themes. Themes were shaped through my interpretation rather than treated as objectively 'found'. I did not use inter-coder reliability as meaning was co-constructed through analysis. The themes were 'features of open spaces', 'the social world', 'the natural world', and 'activities'. I revisited the body maps again to check whether these themes accurately reflected the data and then began the process of refining my themes.

During the refining process, 'features of open spaces' and 'the natural world' were combined to form a broader theme titled 'the environment'. This theme better captured the direct influence that both natural and man-made features of the environment had on the participants' feelings and emotions. While refining the theme, I was mindful of how my own assumptions (influenced by the findings of my other sets of data gathered in Phase One) might influence this process.

Other themes were also redefined. The theme 'the social world' was renamed 'people' and was broadened to incorporate the 'activities' that participants performed with others. This evolved theme focused solely on the direct influence that the different types of people (e.g. friends and family) encountered in open spaces had on participants' feelings and emotions. Together, both of these themes reflect the members of Bronfenbrenner's

(1979) microsystem as they are settings and individuals that the adolescent has direct engagement with.

Finally, a third theme 'when people interact with the environment' was created in order to capture the indirect or tertiary influences felt by participants in open spaces that were previously accounted for in initial themes. These indirect influences are seen to represent the activities of the exosystem. It is via these three themes that my findings were shared.

4.7.2 Tools used in Phase Two

Phase Two of this study consisted of an exploratory geospatial analysis. For this, I used ArcGIS Online. Once the process described in Section 4.5.2 was complete, I made the following calculations:

- I measured the size of the Large Urban Area and Other Urban Area polygons I created to calculate the total area of each urban unit I was studying (in Km²). I then added these to find the size of my total study area.
- I used the polygons I created for each open space within my study area to calculate the number of polygons for each type, giving me the total number of open spaces under study.
- I used Pearson's correlation coefficient to assess the relationship between the number of individual open spaces of each type found in an urban unit and the size of each urban unit.

- I used Pearson's correlation coefficient to assess the relationship between the number of individual open spaces of each type found in an urban unit and the estimated population of an urban unit.
- I converted each open space polygon into a centroid. Using these centroids, I conducted a 'find closest' analysis via ArcGIS Online. This calculates the distance between one centroid and the closest other centroid. I exported this output as an Excel file and used it to calculate the nearest neighbour ratio for each type of open space.
- Drawing upon findings from the mobility map activity, I calculated the percentage of my study area that was within and beyond median walking distance to each type of open space. I achieved this by creating buffers around each open space, setting them at a distance that reflected how far adolescents walk.
- Following this, I calculated the percentage of each urban unit that was classified as each SIMD Quintile, e.g. what percentage of each unit is classified as Quintile 1, etc.
- Finally, for each open space of focus, I calculated the total area of each SIMD Quintile that lies beyond and within the median adolescent walking distance to each open space. This allowed for an assessment of which SIMD Quintiles have better availability of each type of open space.

4.8 Summary

This chapter has outlined the methodological approach I took for this study. This study uses a post-positivist research philosophy and this stance has influenced my approach to addressing my research questions. I developed an exploratory sequential mixed methods research design that consisted of two phases. Phase One consisted of an equal status qualitative and quantitative data gathering phase conducted in three Scottish secondary schools.

Once I compiled this data, I used information on the types of open spaces that are of greatest relevance to adolescents to inform a quantitative exploratory geospatial analysis of the urban units in each local authority of focus. This formed Phase Two of this study.

This study involved working with young people, the use of education settings as venues for data gathering workshops, and the collection of data relating to the activities, movements, and health and wellbeing of young people. As such, I made several ethical considerations, and appropriate protocols were followed to mitigate risk at all stages of the research process.

The subsequent chapters outline the findings generated from the data gathering activities described in this chapter. Chapter Five shares the findings from the mobility map tool that relate to Research Question 1. Chapter Six presents findings related to health and wellbeing derived from the body map and Es & Os activity. These findings relate to Research Question 2. Finally, Chapter Seven details the findings of the exploratory geospatial analysis and, by doing so, relates to Research Question 3 and Research Question 4.

Chapter Five

Findings Part 1: Adolescent use of open space

5.1 Introduction

In this chapter, the findings on adolescent use of open space are shared. These findings are drawn from the data gathered through the mobility map activity administered during the data gathering workshops I conducted in three Scottish secondary schools. The findings presented in this chapter are organised thematically, and these themes are derived from the questions that were used to support participants in completing their mobility maps.

These themes are:

- Where do adolescents go?
- How do adolescents get to the open spaces they visit?
- How long do adolescents spend in open spaces?
- How often do adolescents go to open spaces?
- What do adolescents do in open spaces?

These themes will be explored in order. This chapter concludes with a summary of key findings taken from these themes.

5.2 Where do adolescents go?

The theme '*Where do adolescents go?*' provides a primary initial understanding of my participants' engagement with open spaces. In this section, I identify the number of participants who visit the different types of open spaces listed in the *PAN 65* typology. The types that are visited most frequently by my participants are also identified, indicating which types of open space hold the most significance in the lives of the Scottish adolescents who participated in this study. As such, the findings associated with this theme provide a basis which informs subsequent phases of this study.

In total, 594 adolescents aged between 12- and 15-years-old participated in this study. Of this figure, 561 participants (94.44%) indicated that they visit at least one type of open space listed in the *PAN 65* typology. Of these participants, 33 did not visit any of the open spaces listed.

The number of different types of open spaces visited by participants is shared in Table 5.1, below. For clarity, the phrase '*One type of space*' used in the table indicates that these participants visit only one type of space listed in the *PAN 65* typology of open space. The phrase '*Two types of space*' shows that these participants visited a maximum of two different types of open space listed in the *PAN 65* typology e.g. they visited both Sports Areas and Civic Spaces.

In instances where a participant indicated that they visited two of the same types of space, i.e. a participant shared that they visit two different Sports Areas and no other spaces, this was coded as visiting one type of open space. Due to the low number of participants who visited more than four types of open

space, these figures have been condensed and represented as ‘*more than four types of space*’ to maintain table legibility.

Table 5.1 shows that 374 participants in this study, or 62.97% of the total sample, visited more than one type of open space. This suggests that most participants engage with a variety of open spaces. It was found that 5.56% visited none of the open spaces listed in *PAN 65*, 31.48% visited one type of open space, 30.47% visited two different types, 19.53% visited three different types, and 8.59% visited four types of open space. The percentage of participants who visited more than four types of open space was 4.38%.

Table 5.1

The number of open spaces visited by participants

Number of Open Spaces	Full Sample	
	N	%
No spaces	33	5.56
One type of space	187	31.48
Two types of spaces	181	30.47
Three types of spaces	116	19.53
Four types of spaces	51	8.59
More than four types of spaces	26	4.38

Note. N denotes the number of participants and % denotes the percentage of participants. The total number of participants was 594. Source: Collected data on open space use and author's own calculations.

It was found that all eleven types of open space listed in *PAN 65* are visited by participants to a certain degree, with some types visited more often by participants than others. Table 5.2 focuses on the sample of participants who visit open spaces. In Table 5.2, the eleven types of open spaces listed in the *PAN 65* typology are ranked in order of the number of participants who indicated visiting these spaces in their mobility maps.

Sports Areas are identified as the type of open space that is visited by the most participants with 52.4% of respondents indicating that they visit this type of space. This is followed by Public Parks & Gardens (39.2%), Play Space (35.5%), and Civic Space (33%). I have therefore found that the adolescents who participated in this study engage with a variety of landscapes such as green spaces, grey spaces, natural environments, built environments, controlled environments, planned landscapes, and purpose-built areas.

The fifth most visited open space was Natural/Semi Natural Green Space with 14.3%. This was followed by Amenity Green Space (13.36%), Green Corridors (11.2%), Other Green Space (9.8%), Burial Grounds (7%), and Private Parks & Gardens (5.9%). Allotments were visited by 1.8%, making them the type of open space visited by the fewest participants.

Table 5.2

The number of participants who visit each type of open space

Type of Open Spaces	Sample	
	N	%
Sports Areas	294	52.4
Public Parks & Gardens	220	39.2
Play Spaces	199	35.5
Civic Spaces	185	33
Natural/Semi Natural Green Sp.	80	14.3
Amenity Green Spaces	75	13.36
Green Corridors	63	11.2
Other Green Spaces	55	9.8
Burial Grounds	39	7
Private Parks & Gardens	33	5.9
Allotments	10	1.8

Note. N donates the number of participants and % denotes the percentage of participants. Source: Collected data on open space use and author's own calculations.

As the number of participants who visited Sports Areas, Public Parks & Gardens, Play Space, and Civic Space is much higher than the number of participants who visited the other types of open space, having at least 100 more recorded visits than the next highest open space, Table 5.2 suggests that these four types of open space hold the greatest relevance to the experiences of participating adolescents.. Therefore, they will be the only open spaces of focus for the remainder of this study.

5.3 How do adolescents get to the open spaces they visit?

This theme describes the mode of transport taken by participants to get to the open spaces they visit, assessing the extent to which independent mobility is a characteristic of their open space use. Participant responses were grouped into four categories: those who walk to an open space, those who are taken there by private car, those who cycle there, and those who take public transportation. Figure 5.1 breaks down the responses provided by 177 of the of the participants that visit Public Parks & Gardens, 163 participants who visited Play Spaces, 247 of the participants who visit Sports Areas and 149 of the participants who visit Civic Spaces.

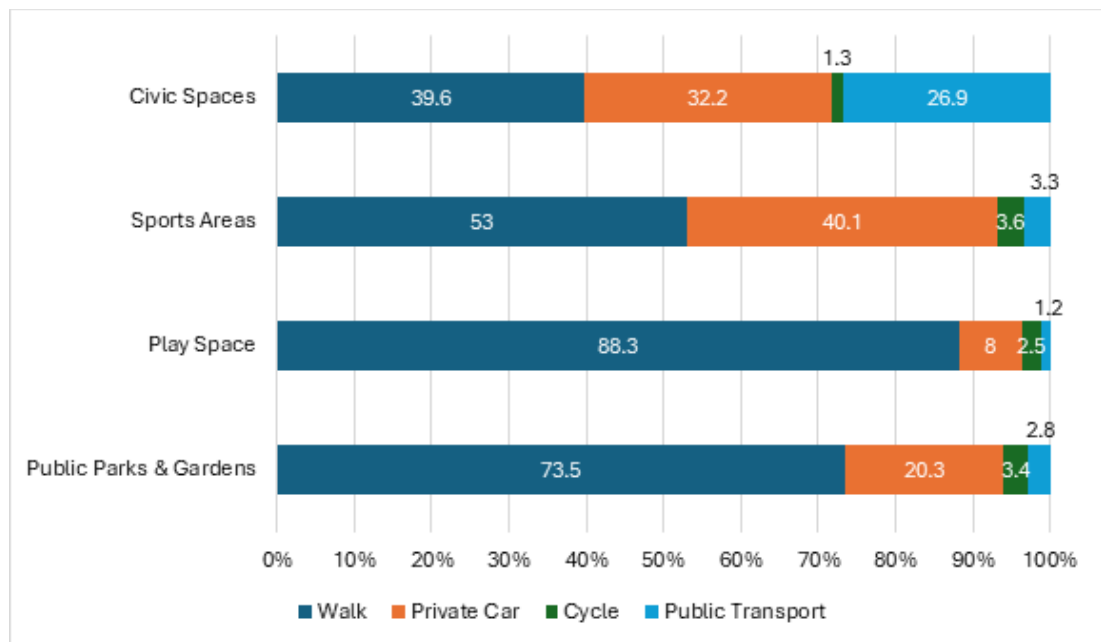
Figure 5.1 shows that transportation patterns are broadly consistent across all four types of open space. In each case, walking is the most common method of travel used by participants. Of those who responded, 73.5% who visit Public Parks & Gardens travel there on foot, 88.3% walk to Play Space, 53% walk to Sports Areas and 39.6% walk to Civic Spaces. Travel by private car was the

second most common option in all instances. In the case of Sports Areas and Civic Spaces, it is notable that the number that travel by private car, 40.1% and 32.2% respectively, is not much less than the number that travel by foot (53% and 39.6% respectively). My finding that private travel to these open spaces is more likely than to other types of open spaces suggests that perhaps the location of these spaces may influence how my participants travel. The spatial distribution of all four open spaces will be explored further in Chapter Seven.

The relationship between spatial dimensions and these findings is further complicated by the findings related to cycling and public transport. Cycling was the third most common method of travel to Public Parks & Gardens (3.4%), Play Spaces (2.5%) and Sports Areas (3.6%), while public transport was the third most common in Civic Spaces (26.9%). The number of participants who take public transport to Civic Spaces is significantly larger than the numbers who take public transport to the other spaces, which range between 1.2 to 3.3%.

Figure 5.1

Percentage of participants who walk, drive, cycle, or take public transport to access Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces



Note. Source: Collected data on open space use and author's own calculations.

In summary, walking is the most commonly used mode of transport by participants to get to Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces. Either public transport or cycling is the least commonly used, depending on the type of open space in question. It is therefore found that, while adolescents aged 12 to 15 may seek out independence as part of their psychosocial development, as suggested by Erikson, Figure 5.1 shows that not all independent active modes of transport (e.g. cycling) are preferred by my participants over other transportation methods (e.g. private car).

Due to the higher number of participants who walk to all four open spaces, the characteristics associated with journeys taken by foot warrant closer attention. To gain a better understanding of the factors that influence the types of open

spaces my participants visit, I will now consider the duration of the journeys taken to access each open space on foot.

Figure 5.2, below, shows the median walking time in minutes taken by participants who travelled on foot to get to the Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces they visit. Median walking time was chosen to remove the influence of outliers when establishing a typical walking time, i.e. particularly long or short walking times. The open space with the shortest median walking time was Play Space, with 5 minutes. In contrast, the longest median walking time was the 15 minutes taken by participants to get to Civic Spaces. The median walking time taken to get to Sports Areas and Public Parks & Gardens was found to be 10 minutes.

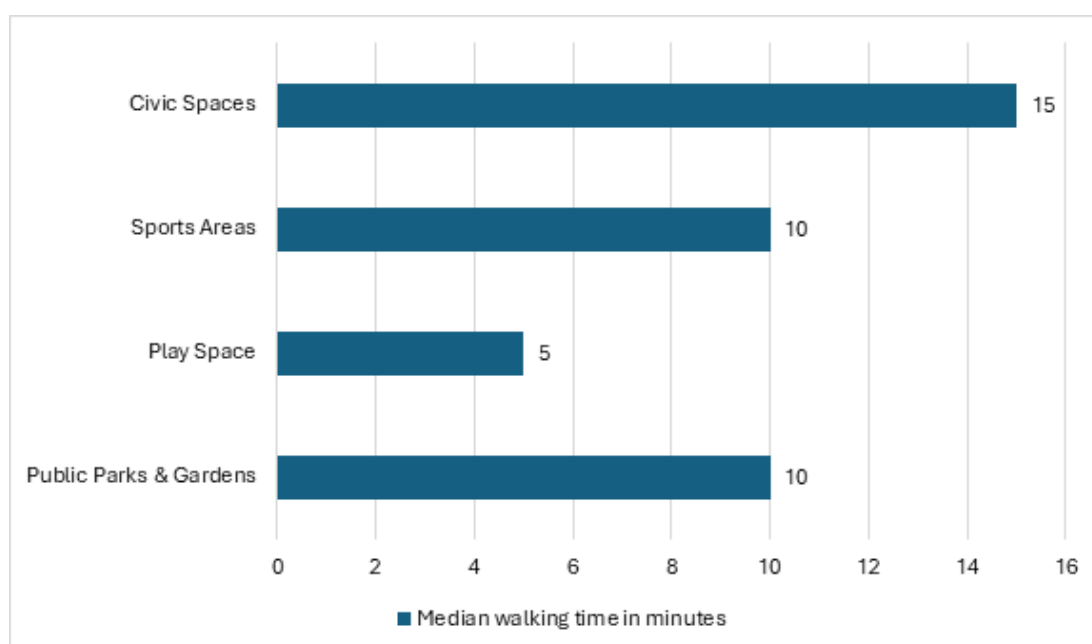
With 5 minutes of walking equating to 400 metres in distance (UNICEF, 2018; Chillon et al., 2014; Colabianchi et al., 2007; Boone et al., 2009; Villanueva et al., 2012), I found that adolescents participating in this study take a median walking distance of 400 meters to access a Play Space, 800 metres to access a Public Park & Garden and Sports Area, and 1200 metres to access a Civic Space.

These findings align with my findings described in Figure 5.1. In Figure 5.1, I found that the type of open space visited the most via walking is Play Space, while the type visited the least by walking is Civic Space. In Figure 5.2 I found that participants walk the shortest distance to get to Play Space and the longest distance to get to Civic Space. Therefore, I can suggest from these findings that the distance between an adolescent's home and an open space

may influence their choice of travel, with participating adolescents perhaps being more likely to walk to open spaces that are closer to their homes.

Figure 5.2

The median walking time in minutes taken by the sample of participants who walk to get to Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces



Note. Source: Collected data on open space use and author's own calculations.

5.4 How long do adolescents spend in open spaces?

In the mobility map, participants were asked to share how long they spend in each open space on average during a typical visit. My findings are shared in this section. The valid responses provided by participants are represented in the box and whisker plot in Figure 5.4. Figure 5.4 illustrates the findings from 165 of the participants who visited Public Parks & Gardens, 148 of the

participants that visited Play Spaces, 227 of the participants who visited Sports Areas, and 128 of the participants who visited Civic Spaces.

I found that the time spent by participants in open spaces is broadly similar in specific open spaces, with the reported time spent in Public Parks & Gardens and Play Spaces sharing very similar findings. While not as closely aligned, there is also some alignment between the findings for Sports Areas and Civic Spaces.

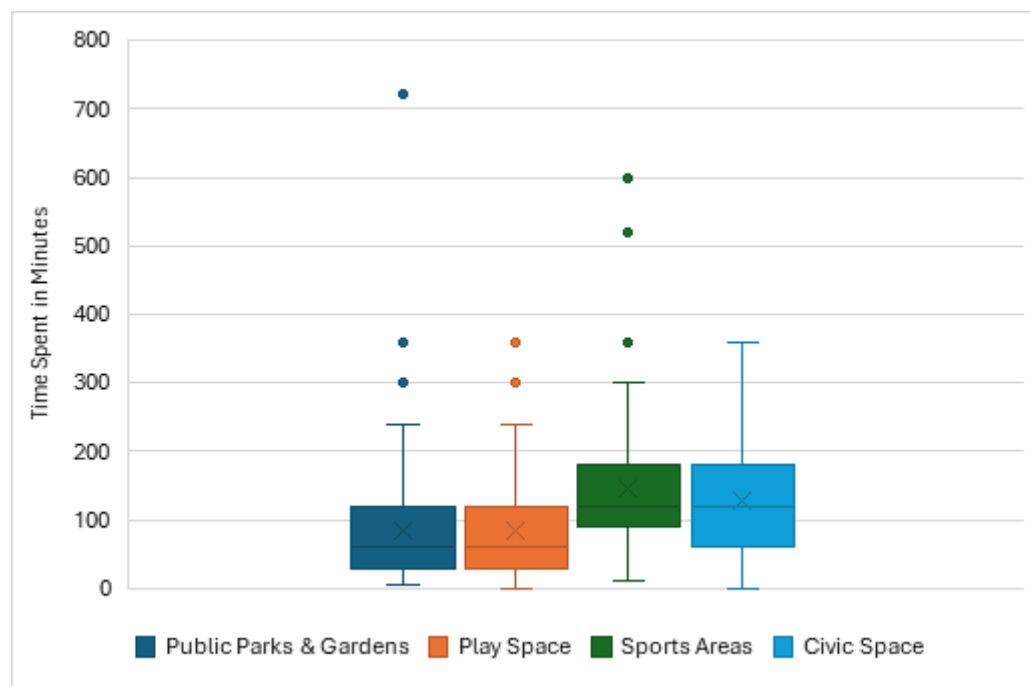
In the case of Public Parks & Gardens and Play Spaces, the median duration spent by participants in both is 60 minutes, the mean duration spent in each is 83 minutes and 84 minutes respectively, the maximum duration spent in both is 240 minutes, and they also share similar outliers. Sports Areas and Civic Spaces tend to host the longest visits, with some participants spending as long as five or six hours in these spaces at any one time. However, although they share a median time of 120 minutes, there is a larger range of time spent in Civic Spaces (359 minutes) than in Sports Areas (290 minutes). In fact, Civic Spaces experience a lower minimum and higher maximum visit duration than all other open spaces, making it the open space with the greatest variability in the time spent there by participants. This suggests that Civic Spaces may have a characteristic that enables them to support more diverse experiences for my participants.

In light of this statement, while I found that Civic Spaces have the most variety in visit durations (Figure 5.3), have the most variety in modes of transport used to access them (Figure 5.1), and take the longest time to walk to (Figure 5.2)

in comparison to other open spaces, no consistent pattern concerning these findings was identified for other types of open space. Although it is plausible that my participants spend more time in spaces they walk the farthest to reach, the findings of this study provide no strong indication to support this assumption.

Figure 5.3

Box plot graph representing how long participants spend in each type of open space



Note. Source: Collected data on open space use and author's own calculations.

Instead, I suggest that the time spent in a particular open space may be linked to the activities that take place there rather than the time taken to access them. I can also suggest that the time an adolescent spends in an open space could perhaps align with how frequently an adolescent visits that space, i.e. perhaps a 'little but often' approach is taken, where they visit an open space frequently

but do not spend a lot of time there. My findings on the frequency of my participants' visits to open spaces are shared in the next section.

5.5 How often do adolescents go to open spaces?

As part of the mobility map activity, I asked participants to include information on how frequently they visit the open spaces they featured. The findings from the 150 Public Park & Garden users, 126 Play Space users, 229 Sports Area users, and 138 Civic Space users that provided this information are explored under this theme.

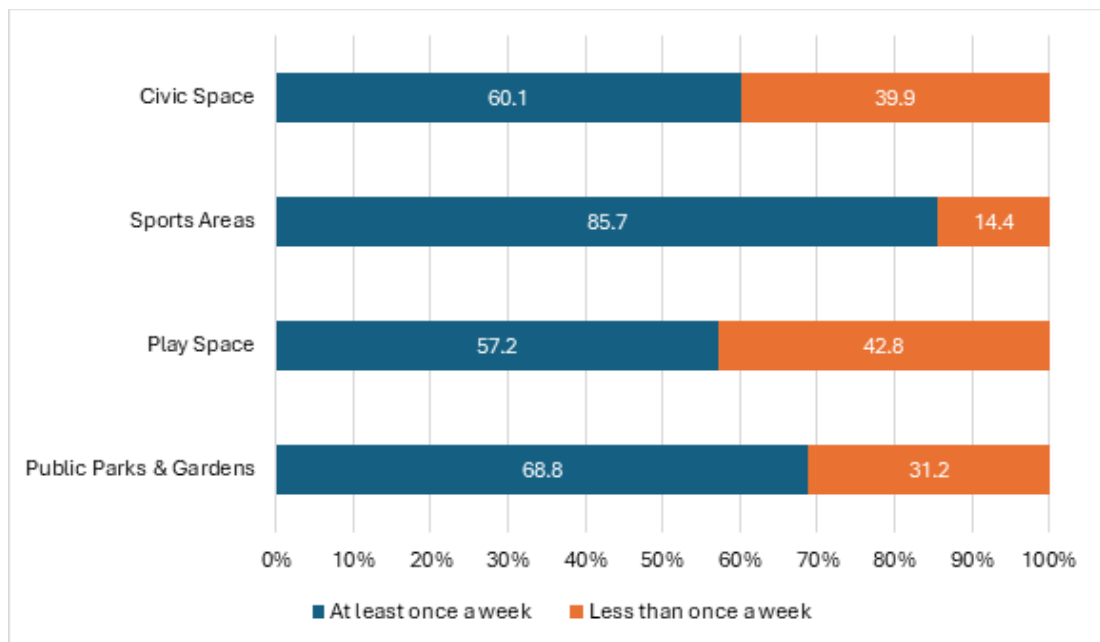
Figure 5.4 shows whether participants visit each type of open space at least once a week or less frequently than that. I found that certain types of open space receive more weekly visits from participants than others. Sports Areas are the spaces that receive the most weekly visits, with 85.7% of responses indicating a weekly visit. It is notable that in Section 5.4, I identified that Sports Areas received some of the longest visits of all open spaces. Therefore, not only are Sports Areas visited the most frequently by participants, but participants tend to spend longer there than in other open spaces, rejecting any belief that participating adolescents take a 'little but often' approach to open space use.

To further understand why this is the case, one may therefore ask whether the activities taking place in Sports Areas afford these longer and frequent visits. I will explore this question further in Section 5.6, where data on the activities taking place in each open space are examined.

Overall, all four types of open space are visited at least once a week by a majority of those who responded. From this, several suggestions can be made. This suggests that perhaps these types of open spaces are highly accessible for a majority of participating adolescents living in urban areas. This will be tested in Chapter Seven through a geospatial analysis of these open spaces. These spaces may have a positive impact on participating adolescents, encouraging frequent visits, or they may be seen as a reliable resource to meet their needs, whether to facilitate a particular activity or support the achievement of a specific outcome. I explore this suggestion in the subsequent section, where the activities that participants engage with in each open space are identified, and in the following chapter, Chapter Six, where the relationship between *Health and Wellbeing* Experiences and Outcomes and adolescent engagement with open spaces is explored.

Figure 5.4

Stacked bar chart representing the percentage of participants who visit each open space at least once a week or less frequently



Note. Source: Collected data on open space use and author's own calculations.

5.6 What do adolescents do in open spaces?

Finally, participants were asked to share what they do in each type of open space they visit. The responses provided by 192 Public Park & Garden users, 172 Play Space users, 273 Sports Area users, and 161 Civic Space users provide the data for this theme.

The types of activities shared by the participating adolescents were varied, but were able to be divided into six distinct categories:

- Vigorous Physical Activity (running, sports, aerobics, gymnastics, martial arts)

- Moderate Physical Activity (walking, riding a bike, dancing, rollerblading)
- Socialising (any reference to meeting, chatting or hanging out with friends)
- Appreciating Nature (wildlife observation, 'be in nature', visiting scenic views)
- Socialisation & Vigorous Physical Activity
- Socialisation & Moderate Physical Activity

The categories describing various types of physical activity were adopted from terminology used in The Scottish Health Survey (Scottish Government, 2023) and by the National Health Service (NHS). The examples of activity provided were taken from the NHS physical activity guidelines (2024). While these guidelines are written for adults, the application of this terminology in The Scottish Health Survey to describe the activity of children supports their use in this study.

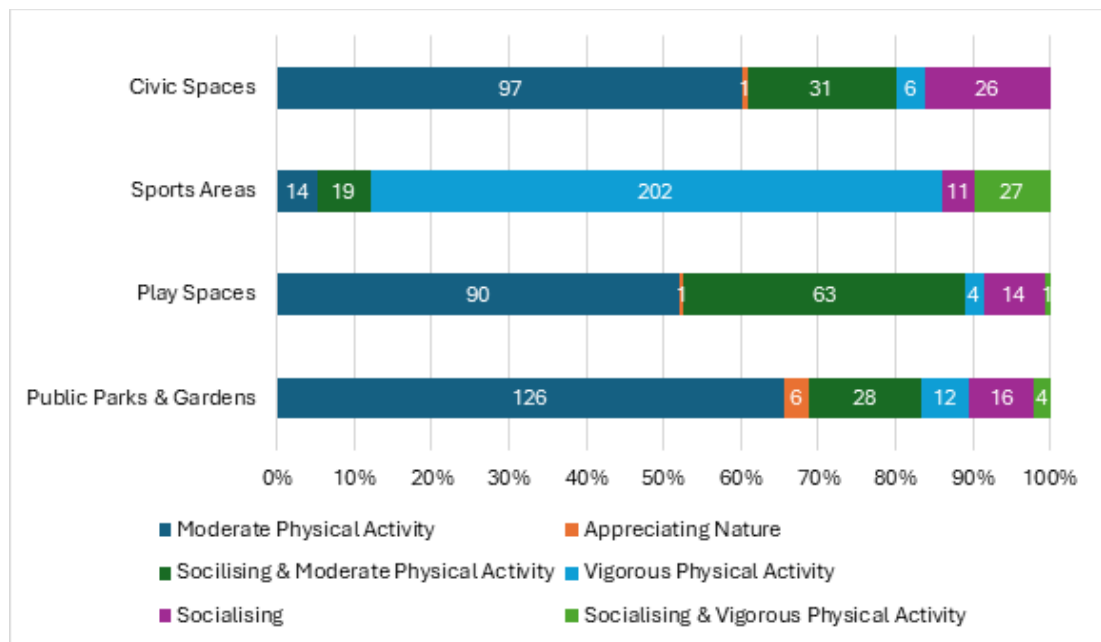
The stacked clustered bar charts below in Figure 5.5 indicate the percentage of participants who engage in each activity in each type of open space:

- For Public Parks & Gardens, I found that 65.6% engage in moderate physical activity, 14.6% socialise while engaging in moderate physical activity, 8.3% socialise, 6.3% engage in vigorous physical activity, 3.1% appreciate nature, and 2.1% socialise while engaging in vigorous physical activity.

- For Play Spaces, I found that 52% engage in moderate physical activity, 36.4% socialise during moderate physical activity, 2.3% engage in vigorous physical activity, 8.1% socialise, 0.6% appreciate nature, and 0.6% socialise while engaging in vigorous physical activity.
- In Sports Areas, I found that 74% engage in vigorous physical activities, 9.9% socialise while engaging in vigorous physical activities, 7% socialise when engaging in moderate physical activities, 5.1% engage in moderate physical activities, and 4% socialise.
- Finally, in Civic Spaces, I found that 60.2% engage in moderate physical activity, 19.3% socialise while engaging with moderate physical activity, 16.1% socialise, 3.7% engage in vigorous physical activity, and 0.6% appreciate nature.

Figure 5.5

Stacked bar chart representing the percentage of participants who engaged with each activity in each open space



Note. Source: Collected data on open space use and author's own calculations.

While the levels of engagement in particular activities appear to be relatively consistent for Public Parks & Gardens, Play Spaces, and Civic Spaces, I observe that each open space affords a particular type of activity more frequently to participants than other spaces. The most obvious example is Sports Areas, which afford vigorous physical activity to more participants than any other space. Public Parks & Gardens are characterised by hosting the most moderate physical activity, while Play Spaces are the most conducive to allowing participants to socialise while engaging in moderate physical activities. When looking for a place to socialise, Civic Spaces appear to be a supportive location for participants in this study.

Thus, while each open space was found to support several different activities for participants, some open spaces were better at supporting particular activities more than others. Overall, Figure 5.5 highlights that physical activity in various forms (whether it be moderate, vigorous, with, or without socialising) is the activity that is most associated with participant use of my four open spaces of focus. In total, 88.6% of Public Park & Garden respondents, 91.3% of Play Space respondents, 96% of Sports Area respondents, and 83.2% of Civic Space respondents engage in physical activity of some form.

Socialising in its various forms, either as an activity in its own right or in tandem with vigorous or moderate physical activity, is the second most common activity in all open spaces. In Public Parks & Gardens, 25% of respondents use this area to socialise. This figure was 45.1% in Play Spaces, 20.9% in Sports Areas and 35.4% in Civic Spaces.

In the case of all four open spaces, appreciating nature was the activity that engaged with the least by participants. No one was found to enjoy nature in Sports Areas, one respondent appreciates nature in Civic Spaces and Play Spaces each, and six respondents appreciate nature in Public Parks & Gardens.

In summary, while Public Parks & Gardens, Play Spaces, Sports Areas and Civic Spaces were found support a variety of activities in this study, my findings suggest that the function of these spaces may influence how participants engage with them. The patterns of usage highlighted in this section suggest that the activities afforded by an open space may influence the duration and

frequency of visits. The implications of these findings will be further examined in Chapter Eight of this thesis.

5.7 Key findings

This section summarises the key findings from five themes explored in this chapter.

In summary, the key findings in this chapter are:

- Open spaces listed in *the PAN 65* typology were visited by 94.44% of participants. Of this number, 62.97% of the total number of participants in this study visit more than one type of open space.
- Participants visit all eleven types of open space listed in the *PAN 65* typology to a certain degree. Sports Areas, Public Parks & Gardens, Play Spaces and Civic Spaces are the types of open spaces that are visited by the most participants, having at least 100 more recorded visits than the next highest open space. Therefore, they are the only open spaces of focus going forward in this study.
- Walking is the most common mode of transport taken by participating adolescents to access Public Parks & Gardens, Play Spaces, Sports Areas and Civic Spaces. Of 736 unique recorded visits to these open spaces, 464 were made by walking, 196 were made by private car, 55 by public transport and 21 by cycling.

- When considering the median amount of time participants spend walking to get to Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces, my findings varied by open space. Generally, participants spend a median time of five minutes to walk to a Play Space, 10 minutes to walk to a Public Park & Garden or Sports Area, and 15 minutes to walk to a Civic Space. These figures will be used to create the radii of 'walkability buffers' in the geospatial analysis.
- When it comes to how long participants spend in open spaces, my findings for Civic Space had the most variation. Participants who visit Civic Spaces tend to spend longer there than participants who visit other spaces. Generally, the time participants spend in Public Parks & Gardens and Play Space was found to be similar. These spaces were found to host the shortest visits, averaging 83 and 84 minutes, respectively.
- Certain open spaces were found to receive more weekly visits by participants than others. Sports Areas were found to receive the highest percentage of weekly visits in comparison to other open spaces.
- Moderate or vigorous physical activities were found to be the activities most highly afforded to participants in all open spaces. In total, 88.6% of Public Park & Garden respondents, 91.3% of Play Space respondents, 96% of Sports Area respondents, and 83.2% of Civic Space respondents visit them to engage in physical activity of some

form. This is followed by socialising in all its forms. In all cases, appreciating nature was found to be the least everyday activity.

Chapter Six

Findings Part 2: Adolescent Health and Wellbeing

6.1 Introduction

In this chapter I share my findings on the extent to which my participants associate use of open space with their subjective health and wellbeing. This chapter is in two parts. The first part shares the quantitative data gathered through the Experiences & Outcomes (Es & Os) activity. The second part shares the qualitative data gathered through the body map activity. These activities were designed to collect data that would provide an answer to Research Question 2: *Is visiting open space associated with adolescents' subjective wellbeing?*

6.2 Part A: Experiences and outcomes activity

During this activity, all participants were provided with a list of 21 *Health & Wellbeing* Es & Os. Participants who entered open spaces in their Mobility Maps were given the following guidance: "I would like you to think about the open spaces you visit. Put a tick beside the sentences that describe how you feel in the spaces that you wrote about". Participants who did not visit the open spaces listed in *PAN 65*, as evidenced in their Mobility Maps, also completed the activity but instead indicated which Es & Os they resonated with. As such,

this section investigates my research question by comparing the subjective health and wellbeing of those in my sample who visit open spaces with those in my sample who do not.

I begin this section by first describing the extent to which participants acknowledged the entire set of Es & Os. Then the degree to which participants fully met each category of *Health and Wellbeing* is described. This is then followed by an assessment of which participants most and least frequently selected individual Es & Os. In all cases, the responses provided by the participants who did and did not visit *PAN 65* open spaces are considered. I then conclude this section with a summary of key findings.

6.2.1 Experiences and outcomes

As I identified in the previous section, out of the 594 adolescents aged between 12 and 15 that participated in this study, 561 visited at least one type of open space listed in *PAN 65*, while 33 indicated that they visited none.

I found that, of the 561 participants who visited open spaces, 21.2% related all 21 *Health and Wellbeing* Es & Os with their experiences in open spaces. In contrast, 8.4% of these participants did not relate any of the listed Es & Os with their visits. Comparatively, of the 33 participants who never visit any open spaces, 12.1% selected all *Health and Wellbeing* Es & Os and 12.1% selected none.

A chi-square test of independence showed a statistically significant association between visiting open spaces and whether participants selected all or none of the *Health and Wellbeing* Es & Os, $\chi^2 (1, N = 594) = 6.07, p = .014$.

A higher percentage of the participants who visit open spaces reported relating all outcomes with their experiences. Mirroring this, a higher percentage of participants who never visit open spaces selected no outcomes. This pattern indicates an association between visiting open spaces and states of *Health and Wellbeing* within my sample but does not indicate a causal relationship.

Overall, the mean additive *Health and Wellbeing* score for participants who visited open spaces was 13.6 ($SD = 6.9$). In comparison, the mean additive *Health and Wellbeing* score for those who never visit an open space was 9.7 ($SD = 7.43$). On average, participants who visit open spaces selected more outcomes compared to their counterparts who never visit any open spaces. I used an independent sample t-test used to compare these mean scores. The result was a p-value of 0.002 ($t (592) = -3.185, 0.05$ significance level), showing that the difference in additive *Health and Wellbeing* scores between participants who do and never visit open spaces is statistically significant.

To further examine the relationship between open space visitation and participant's reported recognition of Health and Wellbeing Es & Os, the following subsection explores the extent to which each category of *Health and Wellbeing* used in the *Broad General Education* phase of the Scottish national curriculum is reported among participants who use open spaces.

6.2.2 Additive health & wellbeing scores

I used additive scores to determine the number of participants who recognised all outcomes in each *Health and Wellbeing* category. By doing this, I identified the category of *Health and Wellbeing* with the highest level of recognition among participants who reported interacting with open spaces. Each category of *Health and Wellbeing* is addressed individually in this section.

6.2.2.1 Mental & emotional wellbeing

The *Mental & Emotional Wellbeing* category consists of eight individual Es & Os, and the additive scores for this category are represented in Table 6.1.

My findings indicate that, although nearly a third of the sample that visited open spaces acknowledged that all *Mental & Emotional Wellbeing* outcomes are related to their experiences in these spaces, not all participants who visit open spaces selected all outcomes. There were participants who only identified some of these outcomes with their open space experiences. It is notable, however, that a higher proportion of participants who visit open spaces selected all outcomes in this category compared to those who never visit open spaces. In total, 29.8% of the sample that visit open spaces selected all eight outcomes, while 15.2% of those who never visit open spaces selected all outcomes. The percentage point difference between these figures is 14.6%. A relative risk ratio of 1.96 indicates that those who visit open spaces are 1.96 times more likely to meet all *Mental & Emotional Wellbeing* Es & Os. These

results demonstrate an association between open space visitation and the likelihood of selecting all outcomes in this category.

Table 6.1 shows that 9.8% of participants who visit open spaces and 27.3% of participants who never visit open spaces selected no *Mental & Emotional Wellbeing* outcomes. The percentage point difference between these figures is 17.5%. A relative risk ratio of 0.36 indicates that those who never visit open spaces are more likely not to select any *Mental & Emotional Wellbeing* outcomes in comparison to their counterparts who do visit open spaces.

The individual scores outlined in Table 6.1 were used to calculate mean additive *Mental & Emotional Wellbeing* scores. This allowed for further comparisons to be made. The mean additive *Mental & Emotional Wellbeing* score for those who visited open spaces was 5.24 ($SD = 2.66$), while the mean additive score for those who never visited open spaces was 3.88 ($SD = 2.99$). A t-test comparing these means yielded a p-value of 0.005 ($t(594) = -2.822$, 0.05 significance level). This result indicates that the difference between these mean values is statistically significant.

Table 6.1

The additive scores for the Mental & Emotional Wellbeing Experiences & Outcomes

N of Es & Os	Visit Open Spaces		Never Visit Open Spaces	
	N	%	N	%
0	55	9.8	9	27.3
1	18	3.2	1	3
2	30	5.3	1	3
3	43	7.7	3	9.1
4	52	9.3	4	12.1
5	61	10.9	3	9.1
6	64	11.4	4	12.1
7	71	12.7	3	9.1
8	167	29.8	5	15.2
Total	561		33	

Note. Where N is the number of participants who selected a particular amount of Es & Os and % is the percentage of participants. Both samples are represented, with 'Visit Open Space Sample' representing the participants who visit PAN 65 open spaces and 'Do Not Visit Open Space Sample' representing the participants who do not. Source: Data collected on open space use, health & wellbeing, and author's own calculations.

6.2.2.2 Social wellbeing

The second wellbeing category is *Social Wellbeing*. There are six *Social Wellbeing* outcomes, and the findings for both samples are outlined in Table 6.2.

In total, 31.6% of participants who visit open spaces selected all six *Social Wellbeing* outcomes, a figure that is 2.6 times higher than the figure recorded for those who never visit open spaces, which was 12.1%. The percentage point difference between these two groups is 19.5%. As such, the findings for *Social Wellbeing* align with the findings for *Mental & Emotional Wellbeing*, showing a

higher proportion of participants who visit open spaces selected all outcomes compared to those who never visit open spaces.

Table 6.2 further shows that 17.1% of those who visit open spaces and 24.2% that do not visit open spaces selected no *Social Wellbeing* outcomes, a percentage point difference of 7.1%. From this, I calculated that those who visit open spaces are 0.7 times as likely to select no Social Wellbeing outcomes compared to those who never visit open spaces.

Drawing upon the data shared in Table 6.2, I calculated the mean additive *Social Wellbeing* scores. The mean score for those who visit open spaces was 3.55 ($SD = 2.25$) while the mean additive score for those who never visit open spaces was 2.42 ($SD = 2.08$). A t-test comparing these means yielded a p value of 0.005 ($t(594) = -2.790$, 0.05 significance level). Therefore, the difference between these mean values is statistically significant.

Table 6.2

The additive scores for the Social Wellbeing Experiences & Outcomes

N of Es & Os	Visit Open Spaces		Never Visit Open Space	
	N	%	N	%
0	96	17.1	8	24.2
1	42	7.5	6	18.2
2	53	9.4	3	9.1
3	58	10.3	7	21.2
4	70	12.5	2	6.1
5	65	11.6	3	9.1
6	177	31.6	4	12.1
Total	561		33	

Note. Where N is the number of participants who selected a particular amount of Es & Os and % is the percentage of participants. Both samples are represented, with 'Visit Open Space Sample' representing the participants who visit PAN 65 open spaces and 'Do Not Visit Open Space Sample' representing the participants who do not. Source: Data collected on open space use, health & wellbeing, and author's own calculations.

6.2.2.3 Physical wellbeing

I found that the patterns associated with *Mental & Emotional Wellbeing* and *Social Wellbeing* also apply to *Physical Wellbeing*. Table 6.3 shows that 46.9% of the sample that visit open spaces selected all four *Physical Wellbeing* Es & Os. As such, it can be suggested that visiting open spaces was associated by almost half of this sample with all *Physical Wellbeing* outcomes. In comparison, only 30.3% of the sample that never visit open spaces indicated the same. This is a percentage point difference of 16.6%.

When the relative risk ratio between these figures was calculated, it was found that participants who visit open spaces were 1.55 times more likely to select all *Physical Wellbeing* outcomes. In addition to this, 30.3% of the sample that never visit open spaces selected no *Physical Wellbeing* outcomes, a figure

that is almost double the figure recorded for the sample that do visit open spaces, which was 16.4% (a percentage point difference of 13.9%). I found that those who visit open spaces were 54% less likely to select no *Physical Wellbeing* outcomes.

To further understand the differences between reported outcomes between these groups, I calculated the mean additive scores using the data shared in Table 6.3. The mean additive *Physical Wellbeing* score for those who visit open spaces was 2.73 ($SD = 1.5$) while the mean additive score for those who never visit open spaces was 1.91 ($SD = 1.63$). A t-test comparing these means yielded a p value of 0.003 ($t(594) = -3.031$, 0.05 significance level). The difference between these mean values is statistically significant.

Table 6.3

The additive scores for the Physical Wellbeing Experiences & Outcomes

N of Es & Os	Visit Open Spaces		Never Visit Open Spaces	
	N	%	N	%
0	92	16.4	10	30.3
1	35	6.2	4	12.1
2	70	12.5	8	24.2
3	101	18.0	1	3
4	263	46.9	10	30.3
Total	561		33	

Note. Where N is the number of participants who selected a particular amount of Es & Os and % is the percentage of participants. Both samples are represented, with 'Visit Open Space Sample' representing the participants who visit PAN 65 open spaces and 'Do Not Visit Open Space Sample' representing the participants who do not. Source: Data collected on open space use, health & wellbeing, and author's own calculations.

6.2.2.4 Relationships

The final set of Es & Os related to *Relationships*. There are three *Relationships* Es & Os, and the additive scores for each sample are listed in Table 6.4.

Of my sample that visit open spaces, 52.9% reported that their experiences in open spaces were associated with all *Relationships* outcomes, making it the category of *Health and Wellbeing* with the highest percentage of participants selecting all outcomes. This was not the case for the sample that never visited open spaces. Of the sample that never visit open space, 30.3% selected all outcomes (a percentage point difference of 22.6%), which is the exact figure that was reported for *Physical Wellbeing*. The relative risk ratio between these *Relationships* figures was 1.74, indicating that those who visit open spaces are more likely to select all *Relationships* outcomes compared to those who do not.

I found that 30.3% of this sample selected no *Relationships* outcomes, a figure that is 1.6 times higher than the 18.9% associated with those who visit open spaces. This is a percentage point difference of 11.4%. Thus, it can be suggested that my participants who visit open spaces are more likely to select outcomes related to building positive relationships than those who never visit open spaces.

The mean additive *Relationships* score for those who visit open spaces was 2.05 ($SD = 1.18$), while the mean additive score for those who never visit open spaces was 1.52 ($SD = 1.23$). A t-test comparing these means yielded a p -

value of 0.011 ($t(594) = -2.549$, 0.05 significance level). This figure suggests that the difference between these mean values is statistically significant.

Table 6.4

The additive scores for the Relationships Experiences & Outcomes

N of Es & Os	Visit Open Space		Never Visit Open Space	
	N	%	N	%
0	106	18.9	10	30.3
1	55	9.8	6	18.2
2	103	18.4	7	21.2
3	297	52.9	10	30.3
Total	561		33	

Note. Where N is the number of participants who selected a particular amount of Es & Os and % is the percentage of participants. Both samples are represented, with 'Visit Open Space Sample' representing the participants who visit PAN 65 open spaces and 'Do Not Visit Open Space Sample' representing the participants who do not. Source: Data collected on open space use, health & wellbeing, and author's own calculations.

6.2.2.5 Summary

In this section, a higher percentage of participants who visit open spaces selected all outcomes in each category compared with participants who never visited open spaces. It was also consistently shown that, in instances where participants selected no Es & Os, the percentage of participants who never visit open spaces was higher in comparison to those who do visit open spaces. Across the categories of *Health and Wellbeing* studied, those who never visit open spaces tended to select fewer outcomes and more frequently selected none.

Based on this information, it is now important to consider whether the acquisition of individual *Health and Wellbeing* Es & Os differs depending on the number of open spaces that participants visit. I will explore this in the next section.

6.2.3 Open spaces and health & wellbeing outcomes

In this section, I explore the extent to which certain *Health and Wellbeing* Es & Os are recognised in relation to the number of open spaces that participants visit. For this purpose, I broke the full sample of 594 participants up into three groups using the mean number of open spaces visited per adolescent (which was 2.11) as a guide. The groups are:

- Those who never visit open spaces – a total of 33 participants
- Those who visit a total number of open spaces that is below the mean (one to two open spaces) – a total of 368 participants. This group is referred to as the group that visits a low number of different open spaces.
- Those who visit a total number of open spaces above the mean, which is referred to as a high number of open spaces (three or more open spaces) – a total of 193 participants.

My findings show that in all instances, a higher percentage of participants who visited a higher number of different open spaces selected each of the individual 21 *Health and Wellbeing* Es & Os. Likewise, in all instances, the participants

who never visit open spaces had the lowest percentage of participants selecting each outcome.

The Pearson's correlation analyses revealed statistically significant but weak positive associations between the number of open spaces visited and the number of wellbeing outcomes achieved across all domains examined. Specifically:

- *Mental & Emotional Wellbeing*: $r = 0.120$, $p = .003$
- *Social Wellbeing*: $r = 0.128$, $p = .002$
- *Physical Wellbeing*: $r = 0.124$, $p = .002$
- *Relationships*: $r = 0.137$, $p = <0.001$

Although these correlations are statistically significant, the strength of association in each case is weak, indicating that while there is a relationship between the number of open space visits and the number of wellbeing outcomes selected, the effect is small. Other influences, such as individual characteristics, social context, or the quality of the spaces visited, may also contribute to these outcomes.

When assessing the percentage of participants from each group (High/Low/Never) who selected each individual outcomes, it was found that the extent to which each individual *Health and Wellbeing* E & O was recognised differed by each group.

In Table 6.5, I first share the data pertaining to the number of participants from each group that selected each *Relationships* outcome. This is the category

that was most comprehensively and consistently selected by participants. As an example, in the case of the *Relationships E & O*, *'I am aware that positive friendships and relationships can promote health and the health and wellbeing of others'*, 65.3% of those who visit a high number of open spaces associated their experiences in open spaces with this outcome. A lower number, 58.2%, of those who visit a low number of open spaces associated their experiences in open spaces with this outcome. Both of these figures, however, are higher than the number recorded for participants who never visit open spaces. I found that only 39.4% of that sample recognised this outcome.

The relative risk ratio was 66% between high and never groups, 48% between low and never groups, and 12% between high and low groups. This pattern of high percentages for the group that visits a high number of open spaces and low percentages for the group that never visits open spaces is replicated for the other two *Relationships* outcomes, as shown in Table 6.5.

Table 6.5

The number (N) and percentage (%) of participants who associated individual Experiences & Outcomes with their experiences in the open spaces that they visit or, in the case of those who never visit open space, Es & Os that they generally aligned with

The <i>Relationships</i> Experiences & Outcomes		High		Low		Never	
		N	%	N	%	N	%
19	I am aware that positive friendships and relationships can promote health and the health and wellbeing of others.	126	65.3	214	58.2	13	39.4
20	I can understand and can demonstrate the qualities and skills required to sustain different types of relationships.	152	78.8	250	67.9	21	63.6
21	I am aware of the need to respect personal space and boundaries and can recognise and respond appropriately to verbal and non-verbal communication.	158	81.9	252	68.5	16	48.5

Note. High signifies the sample that visit a high number of open spaces (3 or more). Low signifies those who visit a low number of open spaces (one or two). Never signifies those who never visit open spaces. Source: Data collected on health & wellbeing, and author's own calculations.

I also observed that the pattern described for the *Relationships* Es & Os applied for the other categories of *Health and Wellbeing*. While the full set of *Relationships* Es & Os was the most comprehensively and consistently selected set of outcomes by participants, the individual *Relationships* Es & Os were not necessarily the outcomes that were the most frequently selected by participants.

The *Mental & Emotional Wellbeing* E & O below, shown in Table 6.6, was the most frequently selected outcome by participants with 84.5% of the high frequency sample, 76.9% of the low frequency sample, and 63.6% of the never sample selecting this outcome:

'I know that friendship, caring, sharing, fairness, equality and love are important in building positive relationships. As I develop and value relationships, I care and show respect for myself and others'

The relative risk between these figures is as follows: a difference of 10% between high and low groups, 21% between low and never groups, and 33% between high and never groups. Table 6.6 shows that, for all *Mental & Emotional* Es & Os, a higher percentage of the group that visits a high number of open spaces selected each outcome, in comparison to other groups.

Table 6.6

Table of the number (N) and percentage (%) of participants who associated individual Mental & Emotional Es & Os with their experiences in the open spaces that they visit or, in the case of those who never visit open space, Es & Os that they generally aligned with

The Mental & Emotional Wellbeing Experiences & Outcomes		High		Low		Never	
		N	%	N	%	N	%
1	I am aware of and able to express my feelings and am developing the ability to talk about them.	119	61.7	204	55.4	10	30.3
2	I know that we all experience a variety of thoughts and emotions that affect how we feel and behave and I am learning ways of managing them.	136	70.5	231	62.8	14	42.4
3	I understand that there are people I can talk to and that there are a number of ways in which I can gain access to practical and emotional support to help me and others in a range of circumstances.	131	67.9	227	61.7	15	45.5
4	I understand that my feelings and reactions can change depending upon what is happening within and around me. This helps me to understand my own behaviour and the way others behave.	151	78.2	256	69.6	21	63.6
5	I know that friendship, caring, sharing, fairness, equality and love are important in building positive relationships. As I develop and value relationships, I care and show respect for myself and others.	163	84.5	283	76.9	21	63.6
6	I understand the importance of mental wellbeing and that this can be fostered and strengthened through personal coping skills and positive relationships. I know that it is not always possible to enjoy good mental health and this if this happens there is support available.	123	63.7	219	59.5	15	45.5
7	I am learning skills and strategies which will support me in challenging times, particularly in relation to change and loss	112	58	197	53.5	15	45.5
8	I understand that people can feel alone and can be misunderstood and left out by others. I am learning how to give appropriate support.	144	74.6	241	65.5	17	51.5

Note. High signifies the sample that visit a high number of open spaces (3 or more). Low signifies those who visit a low number of open spaces (one or two). Never signifies those who never visit open spaces. Source: Data collected on health & wellbeing, and author's own calculations.

The least frequently selected Es & Os differ between groups. For the high frequency group, the following E & O was selected by 54.4% of participants:

'Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community'

For the low-frequency sample and the never sample:

'Representing my class, school and/or wider community encourages me self-worth and confidence and allows me to contribute to and participate in society'

was selected by 45.4% and 21.2% respectively. In addition to this, this outcome was selected by 55.4% of the high-frequency group. Both statements are categorised as *Social Wellbeing* Es & Os and are shown in Table 6.7. Overall, the E & O relating to views, time, and talents was the least frequently selected E & O when all groups are considered.

As was the case with *Mental & Emotional Wellbeing* and *Relationships*, it was consistently found that a higher percentage of the group that visit a high number of open spaces selected each *Social Wellbeing* outcome compared to other groups, with those who never visit open spaces consistently having the lowest percentage.

By identifying two *Social Wellbeing* Es & Os as the least commonly selected outcomes by participants, these findings, once combined with the findings from the previous section that only 31.33% of those who visit open spaces selected all *Social Wellbeing* Es & Os, suggest that *Social Wellbeing* is the category of *Health and Wellbeing* that is the least associated with open space use by my sample compared with other categories. .

Table 6.7

Table of the number (N) and percentage (%) of participants who associated individual Social Wellbeing Es & Os with their experiences in the open spaces that they visit or, in the case of those who never visit open space, Es & Os that they generally aligned with

The Social Wellbeing Experiences & Outcomes		High		Low		Never	
		N	%	N	%	N	%
9	As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others.	155	80.3	246	66.8	17	51.5
10	I recognise that each individual has a unique blend of abilities and needs. I contribute to making my school community one which values individuals equally and is a welcoming place for all.	137	71	207	56.3	18	54.5
11	I make full use of and value the opportunities I am given to improve and manage my learning and, in turn, I can help to encourage learning and confidence in others.	113	58.5	193	52.4	10	30.3
12	Representing my class, school and/or wider community encourages me self-worth and confidence and allows me to contribute to and participate in society.	107	55.4	167	45.4	7	21.2
13	Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community.	105	54.4	173	47	10	30.3
14	I value the opportunities I am given to make friends and be part of a group in a range of situations.	141	73.1	245	66.6	18	54.5

Note. High signifies the sample who visit a high number of open spaces (3 or more). Low signifies those who visit a low number of open spaces (one or two). Never signifies those who never visit open spaces. Source: Data collected on health & wellbeing, and author's own calculations.

In Table 6.8, the percentage of each group of participants who selected each *Physical Wellbeing* outcome is shared. As was the case for other sets of outcomes, I found that a higher percentage of the high frequency group

selected each outcome. In contrast, the lowest percentages were attributed to the group that never visits open space.

In this category the outcome '*I can demonstrate how to travel safely*' was the most frequently selected outcome and was met by 82.4% of the high frequency group, 72.6% of the low frequency group, and 63.6% of the never group. The percentage difference between the high and low groups was 13%, with a 14% difference between the low and never groups, and an 30% difference between the high and never groups.

Table 6.8

Table of the number (N) and percentage (%) of participants who associated individual Physical Wellbeing Es & Os with their experiences in the open spaces that they visit or, in the case of those who never visit open space, Es & Os that they generally aligned with

The <i>Physical Wellbeing Experiences & Outcomes</i>		High		Low		Never	
		N	%	N	%	N	%
15	I am developing my understanding of the human body and can use this knowledge to maintain and improve my wellbeing and health.	142	73.6	230	62.5	14	42.4
16	I am learning to assess and manage risk, to protect myself and others and to reduce the potential for harm when possible.	142	73.6	231	62.8	13	39.4
17	I know and can demonstrate how to keep myself and others safe and how to respond in a range of emergency situations.	132	68.4	227	61.7	15	45.5
18	I can demonstrate how to travel safely.	159	82.4	267	72.6	21	63.6

Note. High signifies the sample that visit a high number of open spaces (3 or more). Low signifies those who visit a low number of open spaces (one or two). Never signifies those who never visit open spaces. (Source: Data collected on health & wellbeing, and author's own calculations)

Overall, these findings describe a consistent pattern across categories of *Health and Wellbeing*. Participants who reported visiting a higher number of

open spaces tended to recognise higher percentages of Es & Os than participants who visited fewer or no open spaces.

6.2.4 Key findings

My findings in this chapter identified the *Health and Wellbeing* Es & Os that participants most associated with their use of open spaces. The key findings from this chapter are:

- Participants in my study who visit open spaces self-report better *Health and Wellbeing* outcomes than those who never visit open spaces.
- Among visitors to open spaces, those who visit a higher number of individual open spaces tend to select more *Health and Wellbeing* Es & Os than those who visit a low number of individual open spaces.
- *Relationships* was the category of wellbeing most consistently and comprehensively associated with experiences in open spaces by participants. This is followed by *Physical Wellbeing*, *Social Wellbeing* and then *Mental & Emotional Wellbeing*.
- The outcome most frequently selected by participants who visit open spaces was: “*I know that friendship, caring, sharing, fairness, equality and love are important in building positive relationships. As I develop and value relationships, I care and show respect for myself and others*”. This is a *Mental & Emotional Wellbeing* outcome.
- The outcomes least frequently selected by participants who visit open spaces was: “*Through contributing my views, time and talents, I play a*

part in bringing about positive change in my school and wider community'. This is a *Social Wellbeing* outcome.

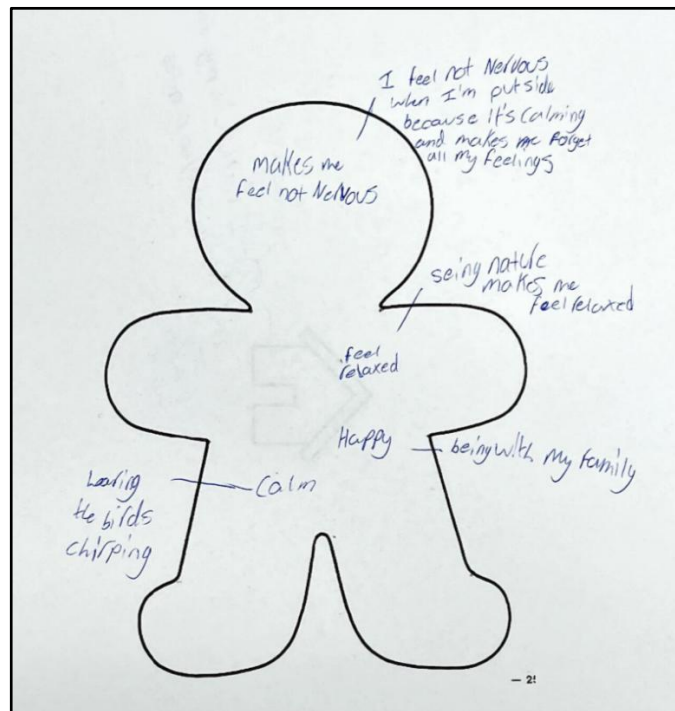
6.3 Part B: Body map thematic analysis

In this section, I share the findings derived from participant body maps. These findings provide further insight into Research Question 2: *Is visiting open space associated with adolescents' subjective wellbeing?*. During the data gathering workshops all participants were provided with a 'gingerbread person' template. As shown in Figure 6.1, on the outside of the template participants were asked to share the things they see or do in the open spaces that they visit. On the inside of the template, participants were asked to share how the things they see or do make them feel. A connecting line was drawn between the feeling/emotion and the activity/feature that evokes it.

A reflexive inductive thematic analysis (Braun & Clarke, 2019) of the body maps identified that my participants associate a range of positive and negative feelings/emotions with open spaces. These feelings/emotions are afforded by a number of attributes and actions. I organised these into three themes: 'the environment', 'people', and 'when people interact with the environment'. I will now discuss these themes in turn.

Figure 6.1

An example of a completed body map



Note. The body map shows things a participant sees and does on the outside and corresponding emotions on the inside.

6.3.1 Theme 1: The Environment

In almost every instance, aspects of the natural and built environment were named in participant responses, making a prominent theme. In Chapter Five, I found that participants very rarely visit open spaces for 'appreciating nature'. However, this theme shows that participants nonetheless recognise the natural environment and the built environment as features of the open spaces they visit and appreciate that they have a bearing on their health and wellbeing.

The natural environment was associated with positive and negative emotions by participants. Negative emotions were found to be primarily associated with elements of the natural environment that participants cannot control, such as the weather and wildlife. Encountering poor weather when visiting an open space was associated with sadness and anger, and the knock-on effects of poor weather, such as muddy conditions, were noted as making some feel dirty, disgusted and angry. A case where an area is allowed to become muddy to the anger of participants infers that this environment is not well-maintained. Poor maintenance and neglect were found to be a key element of Theme 3, and I describe the impacts of inadequate maintenance of open spaces further there.

Other signs of inadequate maintenance of the natural environment, such as 'when the grass is too long' or 'dog poo', were also linked to feelings of anger. Dogs and their excrement were mentioned continuously across body maps, and it evoked a range of strong emotions – disgust, sadness, and annoyance. It was considered 'gross' and seeing it in open spaces made some feel 'sick'. In contrast, dogs themselves were frequently characterised as very positive features of open spaces. Many participants shared their excitement when seeing their dog in an open space, felt happy, calm and relaxed when taking their dog on a walk in an open space, happy when seeing a cute dog, or happy when seeing dogs running around. For others, simply seeing people walk dogs brought them a sense of calm. As such, dogs in open spaces have a very positive influence on the wellbeing of many.

However, dogs were also described as something that made one participant 'nervous', and dogs were generally seen as being 'scary' by others. Therefore, there are dichotomies present in this data. My findings show that participants' experiences in open spaces are subjective. A feature found in an open space (in this case, dogs) can evoke positive emotions in some and negative emotions in others, suggesting that agents of wellbeing in open spaces are not straightforward.

Overall, open spaces were perceived as intimidating by many participants due to their natural environments. Birds and insects were particularly noted as being scary features. Fears were expressed about swans, geese, seagulls, wasps, bees, and midges. In contrast, the presence of mammals in an open space did not have this effect. In addition to dogs, observing animals like squirrels and deer in open spaces made some participants feel calm. In addition to this, while swans, geese, and seagulls were perceived as scary, interestingly, their habitats were not. Open spaces where participants could see and hear bodies of water of various types (streams, rivers, canals, and waterfalls) were always described positively and generally were related to calmness.

I found that features of the natural environment were often associated with feelings of rejuvenation. Trees were mentioned frequently for their restorative properties in participant body maps. They were associated with safety, comfort, protection, peace, and fun (in relation to tree swings). When trees swayed in the wind, one participant felt relaxed. For another, seeing trees inspired a sense of awe and made them feel small, signaling that this connection with

nature provided an understanding of their place in the world. Aligning with this, one participant identified that trees made them feel 'hidden', indicating that trees offered a place of retreat for them from the 'scary' aspects of the open space they visit.

In contrast to the natural environment, which supported a range of positive and negative emotions, I found that the built environment was primarily associated with positive emotions. Features of the built environment such as bike trails, football grounds, skate parks, goal posts, play equipment, and clear pathways enabled participants to dance, do flips, play football, bike, go for walks, and 'run about' which, in turn, were recorded to facilitate feelings of calmness, excitement, safety, happiness, and fun. Engaging in sports such as football, rugby and golf was aligned with promoting feelings of safety, excitement, joy and confidence.

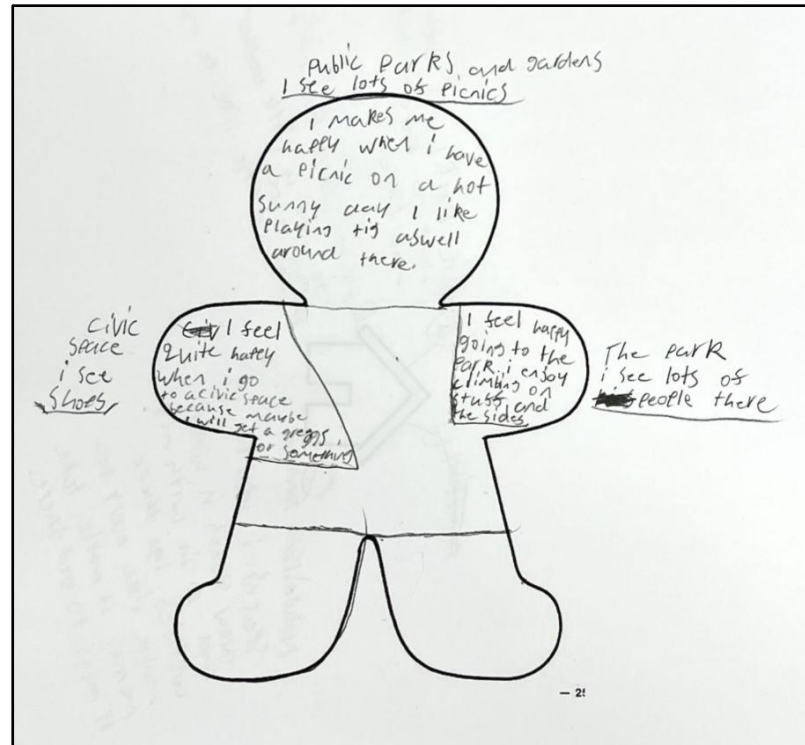
What could be described as examples of 'street furniture' were also mentioned in various body maps and these were associated with positive emotions. Benches provided opportunities to sit and made participants feel protected and comfortable. These feelings, described in Theme 2 as associated with friends and family, suggest that benches may serve as a tool for my participants and those close to them to interact, bond, and build relationships. Notably, one participant was happy to see traffic lights in the open space they visit, suggesting that they value the role of urban infrastructure in facilitating their safe movement to, from and within open spaces. In addition to this, some felt safe and calmed by the presence of streetlights, indicating that these participants visit open spaces at night. The time of day at which participants

visit open spaces was not a focus of this study, but this finding suggests that it may be a variable that influences open space use.

Due to the lack of research exploring Scottish adolescent use of Civic Space, it is worth noting that activities and features specific to engaging with Civic Spaces, such as 'the street', 'going up the street', 'the town', and 'shops' were mentioned and associated with positive feelings by participants. As noted in Figure 6.2, one element of Civic Space that makes it unique from others is that it enables the ability to get food. All mentions of food in body maps were done so in a positive way and appeared to be something to look forward to when visiting open spaces: *'I feel quite happy when I go to a civic space because maybe I will get a Greggs or something'*. Food was often described as a social activity, and eating food, whether from food-on-the-go retailers like in the example provided or as picnics, was something to do with friends and family when in open spaces.

Figure 6.2

A body map showing the distinct advantages of Civic Spaces 'I feel quite happy when I go to a civic space because maybe I will get a Greggs or something'.



In summary, the environment associated with an open space is reported to affect participants in different ways. The built environment was found to support positive wellbeing. Street furniture and urban infrastructure make participants feel safe and support activities that foster happiness, enjoyment and fun. The natural environment, in comparison, was found to be restorative for participants. Many features of the natural environment made participants feel calm, relaxed and happy. However, some features of the natural environment negatively affect mood and inspire feelings of fear and anger. I conclude from these findings that the environment, by being multifaceted, is

inherently complex and evokes intricate and conflicting feelings for my adolescent participants.

6.3.2 Theme 2: People

My participants encounter a variety of people in open spaces, and I found that their feelings towards these individuals depend on their relationships with them.

Engaging with family members when visiting open spaces was always associated with positive emotions. In general, family made participants feel protected, safe, loved, joyful, happy, and calm. Mentions of the words 'protected' and 'safe' indicate that there may be dangers present in open spaces that participants rely on their families to shield them from. Indeed, the body maps illustrated that there are a lot of 'scary' people in the open spaces that participants visit. Participants mentioned that seeing 'junkies' or 'neds' makes them want to leave the open space they are in. Seeing people engage in anti-social behaviour in open spaces such as smoking or drinking is also scary. Certain demographics of the population are found in open spaces where participants feel they need protection. Older teenagers can make some people feel nervous, small children can scare others, and a few individuals may feel scared when they see people their age. This suggests that participants' responses to different age groups in open spaces are contextual and highly variable, depending on an individual's frame of reference and experience.

As a further example, one participant shared that they feel scared when they see Irish people in the open spaces they visit, suggesting that the fears my

participants face in open spaces also have a cultural dimension rather than just a social one. A fear such as this, in the context of this study, is likely derived from the cultural context of the participant and influenced by other social factors, particularly if the open space in question was a Sports Area. When faced with any of these fears in an open space, spending time with family and engaging in activities with them may well provide a sense of comfort and protection.

No other group were mentioned in body maps more than friends. Friends were associated with a series of activities and a variety of emotions. In general, being with friends in open spaces makes participants feel loved, joyful, relaxed, safe, happy, and calm. Specifically, the act of 'hanging out' with friends in open spaces makes participants feel comfortable, included, and connected. Hanging out was also shown to be a mitigator of negative mood in one response where meeting friends resulted in one participant 'not feeling depressed'. Friends make open spaces fun, and simply seeing friends in open spaces made participants feel excited. Engaging in activities with friends like walking or playing sports had positive connotations, with one participant sharing that being out with friends in open spaces made them feel 'over the moon'

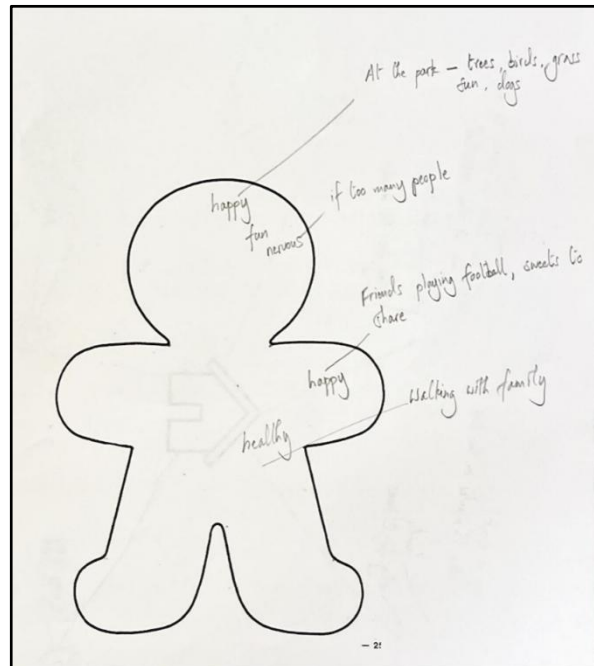
However, unlike interactions with family members, encountering friends in open spaces can lead to negative emotions, illustrating the complex and varied influences that friendships can have at this life stage. Open spaces were characterised as locations where fallouts between friends can happen, where people can lose friends, and where bullying occurs. The participants who

observed these issues in the open spaces they visit linked them with feelings of sadness. Open spaces are also areas where bullying and fights occur, both online via games like *Roblox* and in person. Open spaces are where people get hit, and where people can be seen crying. These sightings were also related to feelings of sadness. From my findings, it is clear that friendships influence how an adolescent experiences an open space and due to the complex social dynamics at play, this influence can be positive or negative.

Social interaction creates challenges for some participants in other ways. Theme 2 identified trees as offering opportunities for retreat and protection. Unfortunately, for some participants, finding zones of retreat in open spaces is not always possible. The body maps, such as Figure 6.3, identify situations where crowds or groups of people are seen in an open space, and this leads to many negative feelings/emotions. One participant identified that '*going somewhere I thought would be quiet but there are lots of people*' is annoying to them. However, this is not a singular case. The presence of many people in an open space can make some feel stressed, nervous, awkward, and anxious. One participant describes the open space they visit as a place that makes them feel '*calm when it is not busy*'. As such, this response shows that it is possible for an open space to offer two conflicting emotions to the same adolescent in different contexts. The next theme describes the feelings derived when people interact with the environments found within open spaces.

Figure 6.3

Body map showing an example of social anxiety, linking 'if too many people' with 'nervous'



6.3.3 Theme 3: When people interact with the environment

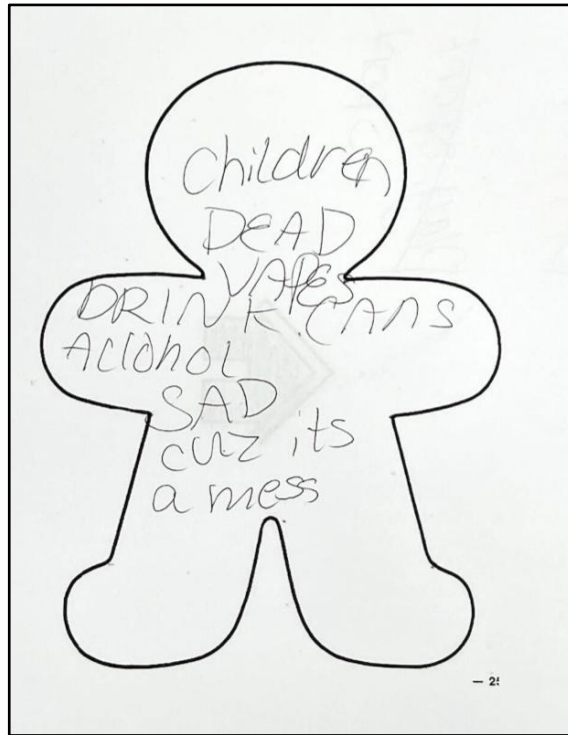
The extent to which people interact with open spaces and the traces they leave behind was a recurring theme. In addition to the long grass and dog poo discussed in Theme 1, there were several accounts of people failing to intervene or engage with open spaces when they should, leading to poor maintenance or neglect. This always led to negative feelings. One participant recorded seeing 'broken outside equipment' in the open space they visit and associated this with sadness. Goals with no nets were annoying to another participant. Examples such as these show that failure to maintain built features of open spaces can mitigate the positive feelings/emotions associated with their use (calmness, safety, and happiness as identified in Theme 1).

Poor maintenance affects participants' feelings in open spaces in several ways. Some participants recorded seeing bins described as 'smelly' in the open spaces they visit. A bin that has yet to be emptied tends to emit odours, indicating neglect. The smell of the bin may also act as a deterrent and dissuade people from using it. This increases the presence of litter, an item mentioned in many body maps. Participants are frustrated by the amount of litter found in the open spaces they visit. It makes them mad, and they are ashamed of the people who leave litter behind. Litter makes some feel unsafe, and results in injury. One participant reported seeing 'glass everywhere' in the open space they visited and associated this with 'pain', suggesting they had been injured by the broken glass in some way.

Evidence of anti-social behaviour found by participants in open spaces also results in feelings of unsafety, even when the perpetrators of said anti-social behaviour are not present. Vape boxes and drink bottles all over the floor, and the presence of drink cans made respondents like the one in Figure 6.4 feel unsafe and sad. The remains of bonfires were scary and made one participant feel furious, suggesting that they saw this act as being disrespectful either to him as an open space user or to the open space itself.

Figure 6.4

Body map showing an example of litter and remnants of anti-social behaviour. 'dead vapes', 'drink cans', 'sad cuz its a mess'.



Finally, I identified several deterrents that hinder a participant's ability to access an open space. A small number of participants mentioned modes of transport in their body maps, and this provides a context behind why some forms of mobility were identified in Chapter 5 as being more popular than others.

Specifically, bus stops were associated with feelings of anxiety and taking public transport made participants feel awkward, perhaps due to the social interactions that may be required. Being in open spaces with family members was exclusively positive, however, taking private transport to get there was associated with negative emotions. Car parks were described as scary and made participants feel anxious, perhaps suggesting fears of car accidents,

being knocked down, or abductions. Cars themselves were also seen as scary, perhaps why one participant was happy to see traffic lights in the open space they visited. One participant was disappointed when they saw a lot of cars in the open space they visited, perhaps indicating the presence of lots of people, a negative feature of an open space described in Theme 2. Overall, while not many participants mentioned how they get to open spaces in their body maps (which is expected as this was a point covered in the mobility map), those who did were found to do so in a negative light. This is worth further consideration when discussing barriers to open space access for this age group.

6.3.4 Key Findings

My findings, shared in this section, identify open spaces as complex places rich in meaning for my participants. The features that participants see in the open spaces they visit and the things that they do while there do not evoke the same feelings and emotions in everyone. As such, how an adolescent experiences an open space is highly subjective and contextual.

Nevertheless, there are some key findings derived from this thematic analysis:

- Features of the built environment in open spaces were commonly associated with positive health and wellbeing.
- Features of the natural environment generally were found support positive health and wellbeing, but can evoke feelings of fear too.

- Being with family in open spaces was found to be consistently positive and emotions associated with family suggest that they play a protective role for participants when in open spaces.
- Being with friends in open spaces is generally positive but can cause participants to feel negative emotions. Open spaces were suggested to provide an important venue for 'hanging out' with friends, and this activity was found to evoke positive emotions and mitigate negative ones.
- Participants observe anti-social behaviour in the open spaces they visit, and this always leads to negative feelings/emotions in the examples shared. This applies to individual cohorts of people and the remnants of their anti-social activities that they leave behind.
- Participating adolescents care about the maintenance of open spaces and note that poorly maintained open spaces lead to negative experiences.
- Civic Spaces were commonly associated with eating with friends, and this was a positive association.

Chapter Seven

Findings Part 3: Exploratory Geospatial Analysis

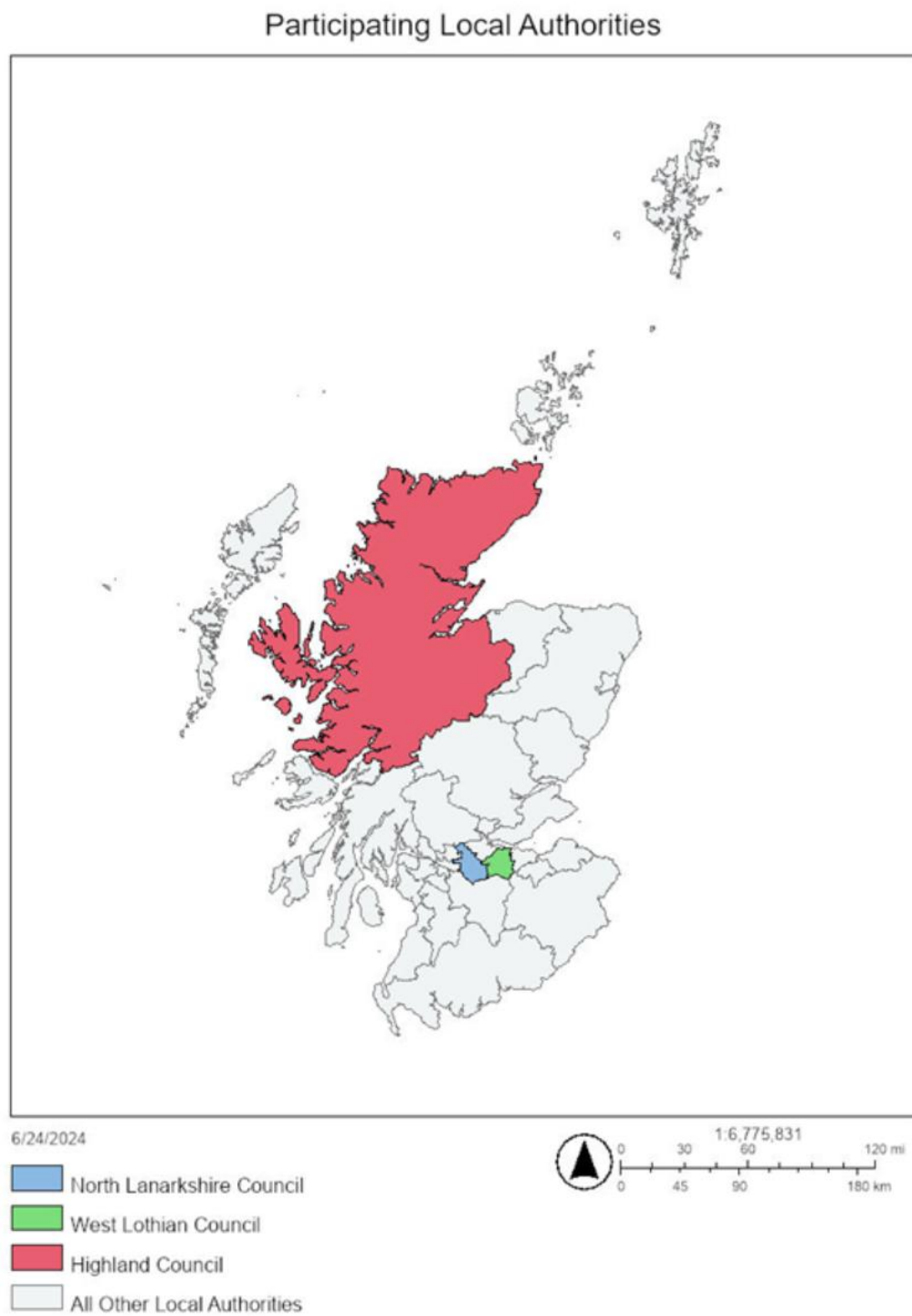
7.1 Introduction

In this chapter, I share my findings from Phase Two of this study, which was an exploratory geospatial analysis. This phase aimed to provide an answer to Research Question 3: *‘What are the spatial distribution patterns of the types of open spaces used by adolescents within the boundaries of Scottish urban units?’*, and Research Question 4: *‘Are the spatial distribution patterns of open spaces used by adolescents within the boundaries of Scottish urban units associated with area-based measures of relative deprivation?’*.

To do so, my analysis focused on identifying the locations and spatial distribution patterns of the four types of open spaces found to be of most significance to my participants (Public Parks & Gardens, Play Space, Sports Areas, and Civic Space) within my study area (which comprised the Large Urban Areas and Other Urban Areas of the Highland Council, North Lanarkshire Council, and West Lothian Council). I also assessed whether this distribution is linked to area-based measures of relative deprivation (SIMD). My study area is visually represented in Figure 7.1 and described in detail in Section 7.2.

Figure 7.1

Map of the research study area.



Note. Adapted from Seggie (2025).

The primary data I shared in Chapter Five was used to inform my analysis. As shared in Chapter 5, Sports Areas were found to be the most visited open spaces by participants. Of the 561 participants who visited an open space, 49.5% visited a Sports Area. In comparison, 37% of those who visited an open space visited a Public Park & Garden, making it the second most popular type of space for participants to visit, and 33.5% of participants recorded a visit to a Play Space, making it the third most visited type of open space. Civic Spaces were ranked as the fourth most visited type of open space overall, being visited by 31.1% of participants. Given the significance of these four spaces, it is crucial to gain an understanding of their spatial distribution within Scottish urban units to assess whether proximity-based equity in access is achieved for all adolescents.

I also found in Chapter Five that walking was the most dominant mode of transport used by participants to get to these open spaces. Using the median walking distances taken by participants to access open spaces, I share the percentage of each urban unit that is within or beyond the median participant walking distance in this chapter. This was found by creating walkability buffers around the perimeters of the Public Parks & Gardens, Play Spaces, Sports Areas and Civic Spaces in my study area.

In each section of this chapter, I describe my findings pertaining to a particular type of open space. In all cases, the spatial distribution pattern of a type of open space within individual urban units is described first. I then share the extent to which these spatial distribution patterns are linked to area-based measures of relative deprivation. As was the case in all previous chapters,

open spaces will be covered in the order in which they are presented in the *PAN 65* typology.

7.2 The study area

In total, I analysed 14 urban units covering a total area of 202.12 km² as part of this study. For clarity, in this chapter, individual urban areas are referred to as 'urban units' to avoid any confusion that may be caused by using the word 'area', which can refer to both a location and an amount of space. A summary of each urban unit included in this study is provided in Table 7.1.

Table 7.1 shows that each of the local authorities in my study area has a different number of urban units, varying in both size and population. However, I recognise that these local authorities share common characteristics despite being located in different regions in Scotland, with each containing a mix of larger and smaller units as well as units with high and low populations. This commonality allows for meaningful comparisons across my study areas despite variations in size and population amongst individual units.

Table 7.1*Table of studied urban units*

Local Authority	Name	Size (km ²)	Urban-Rural Classification
Highland Council	Nairn	4.72	Other Urban Area
	Inverness	30.99	Other Urban Area
	Fort William	9.11	Other Urban Area
North Lanarkshire Council	Kilsyth	3.36	Other Urban Area
	Cumbernauld	21.62	Other Urban Area
	Chryston	3.43	Other Urban Area
	Coatbridge/Airdrie	24.37	Other Urban Area
	Motherwell	45.12	Large Urban Area
West Lothian Council	Linlithgow	4.95	Other Urban Area
	Broxburn	5.28	Other Urban Area
	Livingston	31.81	Other Urban Area
	Bathgate	10.73	Other Urban Area
	Armadale	2.91	Other Urban Area
	Whitburn	3.72	Other Urban Area

Note. Local authorities are listed in alphabetical order, and units are listed from north to south. Table includes size of each urban unit (author's own calculations) and their Scottish Government Urban – Rural Classification (2022).

7.3 Public Parks & Gardens

In this section, I describe the spatial distribution patterns of Public Parks & Gardens. Following this, I draw upon the median walking distance taken by participants to visit a Public Park & Garden to determine the percentage of my study area that lies within and beyond walking distance to a Public Park & Garden. This is followed by an identification of which Scottish Index of Multiple Deprivation (SIMD) Quintiles are most and least served by the recorded spatial distribution of Public Parks & Gardens, i.e. which SIMD Quintiles are associated with being within and beyond the walkability buffers that surround each open space.

7.3.1 The spatial distribution of Public Parks & Gardens

In total, 185 Public Parks & Gardens were present across my study area, equating to an average of one Public Park & Garden per 1.09 km². Using Pearson's correlation coefficient, I found a moderately strong positive relationship between the number of Public Parks & Gardens recorded in individual urban units and the size of those units as listed in Table 7.1 ($r = 0.7647$). A very strong positive relationship was found between the number of Public Parks & Gardens recorded in an urban unit and the estimated total population of a unit as listed in Table 7.1 ($r = 0.9191$). Through these findings, I infer that, in the case of my study area, population size is a more reliable predictor of the number of Public Parks & Gardens within an urban unit. As the total estimated population increases, the number of Public Parks & Gardens tends to increase accordingly.

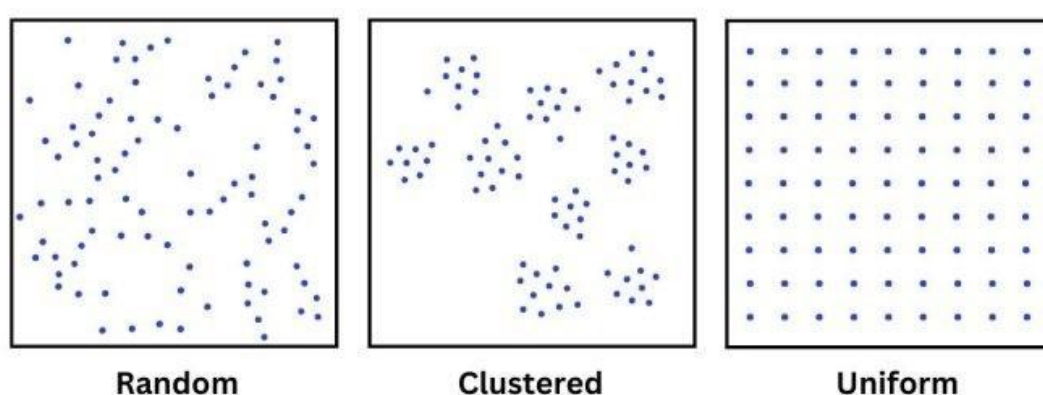
To describe the spatial distribution of open spaces in the studied urban units, I used a nearest neighbour analysis. The results of this analysis were interpreted using the classifications represented in Figure 7.2. The spatial distribution of open spaces can be described as random, clustered or uniform/regular.

For there to be equal availability to any open space, a uniform or regular spatial distribution should be present. This describes a scenario where a type of open space is located at regular intervals across an urban unit with no clusters or high/low density areas. A clustered spatial distribution pattern sees individual

open spaces grouped together, which creates areas of high and low concentration in a unit. A cluster may be recorded around a natural feature/barrier, such as a river, or an urban feature, such as a housing development or road. A random spatial distribution pattern represents no regularity in intervals across an urban unit and no identifiable clustering.

Figure 7.2

Types of Spatial Distribution (GIS Geography, 2024)



I analysed the general spatial distribution pattern of Public Parks & Gardens within my study area by drawing upon polygon centroids. A nearest neighbour ratio of 1.114 was yielded, suggesting that there is a tendency for Public Parks & Gardens to be distributed randomly within my study area, with some regularity. This spatial distribution pattern suggests a deliberate approach to planning the location of some Public Parks & Gardens in my study area. This is because the nearest neighbour ratio suggests that the distribution of Public Parks & Gardens in my study area is more regular than what would be expected to occur by chance.

7.3.2 Public Parks & Gardens and area-based measures of relative deprivation

In total, of the 202.12 km² that was included in this analysis, I found that 29.6% was located beyond the median participant walking distance to a Public Park & Garden (Table 7.2). This suggests that a significant portion of my study area may face limited walkable access to Public Parks & Gardens.

I provide an overview of the total area studied, and its associated SIMD Quintiles are provided in Table 7.2. Interestingly, Table 7.2 shows that the most deprived areas, Quintile 1, and the least deprived areas, Quintile 5, cover a very similar total area (with only 0.64 km² in difference). As such, they are directly comparable and, in this instance, I observed that a higher percentage of land classified as Quintile 1 in my study area (85.3%) is within median walking distance to a Public Park & Garden than Quintile 5 (72.1%), revealing that the most deprived areas are suggested to have the best Public Park & Garden provision in my studied area.

Table 7.2 also shows which SIMD Quintile in my study area had the highest percentage of its total area lying beyond walking distance to a Public Park & Garden. At 40.4%, Quintile 3 was found to have the highest proportion of its total area beyond a walkability buffer. As such, I found that moderately deprived areas in my study area are suggested to have the poorest provision of Public Parks & Gardens. Thus, from these findings, I suggest that adolescents living in locations classified as Quintile 3 are perhaps the least

likely to live within walking distance to a Public Park & Garden. As such, the spatial distribution patterns of Public Parks & Gardens have been suggested to lead to a proximity-based inequity in availability that is linked to specific SIMD Quintiles.

Table 7.2

The amount of area in km² of each SIMD quintile that lies within and beyond a Public Park & Garden walkability buffer in the total area studied

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total Area
% Area within a walkability buffer	85.3%	71.3%	59.6%	65.7%	72.1%	70.4%
% Area beyond a walkability buffer	14.7%	28.7%	40.4%	34.2%	27.9%	29.6%
Total Area in km²	34.13	50.46	37.29	46.75	33.49	202.12

Note. Source: Author's own calculations

7.4 Play Space

In this section, I describe the distribution of Play Spaces across my study area. In the first sub-section, I share the spatial distribution patterns of Play Spaces within urban units. I then determine the percentage of my study area that lies within or beyond walking distance to a Play Space. I conclude this section by identifying which SIMD Quintiles are most and least served by the recorded spatial distribution patterns of Play Spaces, i.e. which SIMD Quintiles are associated with being within and beyond the walkability buffers that surround each open space.

7.4.1 The spatial distribution of Play Spaces

Play Spaces were the most numerous open spaces studied. In total, 590 individual Play Spaces were recorded across the fourteen urban units studied, resulting in an average of one Play Space per 0.34 km².

A Pearson's correlation coefficient indicated a very strong positive relationship ($r = 0.9619$) between the number of Play Spaces in an urban unit and the size of an urban unit. In contrast, a moderate positive relationship ($r = 0.546$) was found between the number of Play Spaces and the total estimated population of a unit. Therefore, in the case of Play Spaces in my study area, I suggest that the size of an urban unit is a better predictor of the number of Play Spaces present. In the case of my study area, as the size of an urban area increases, the number of Play Spaces recorded tends to increase in turn.

A nearest neighbour analysis of Play Spaces within my study area generated a nearest neighbour ratio of 0.958. This indicates that the general distribution of Play Spaces within my study area is somewhat random but with some mild clustering. This spatial distribution pattern suggests that there may be spatial inequality in the availability of Play Spaces within my study area, with adolescents living in locations with mild clustering potentially having a greater opportunity to have multiple Play Spaces close by.

7.4.2 Play Spaces and area-based measures of relative deprivation

In total, I found that 36.9% of the total study area was beyond the median participant walking distance to a Play Space, highlighting that just over a third of my study area may have limited availability of Play Spaces.

Table 7.3 shows the percentage of each SIMD Quintile that lies within and beyond walking distance to a Play Space in my study area. As was the case for Public Parks & Gardens, Quintile 1 was found to be the SIMD Quintile classification with the most of its total area within walking distance to a Play Space (70.3%). As such, in the case of my study area, it was found that those living in the most deprived areas potentially have the best access to Play Space via walking.

Quintile 4, on the other hand, was found to be the classification with the highest percentage of its total area falling beyond a walkability buffer (42.7%). There was a 1% difference between the percentage recorded for Quintile 3 and Quintile 4. This finding shows that, as was the case for Public Parks & Gardens, adolescents living in areas of moderate deprivation are potentially less likely to live within walking distance to a Play Space. As such, I have found that the spatial distribution patterns of Play Spaces in my study area also may lead to a proximity-based inequity in availability that is linked to specific SIMD Quintiles.

Table 7.3

The amount of area in km² of each SIMD quintile that lies within and beyond a Play Space walkability buffer in the total area studied

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total Area
% Area within a walkability buffer	70.3%	64.5%	58.3%	57.3%	63%	63.1%
% Area beyond a walkability buffer	29.7%	35.5%	41.7%	42.7%	37%	36.9%
Total Area in km²	34.13	50.46	37.29	46.75	33.49	202.12

Note. Source: Author's own calculations.

7.5 Sports Areas

In this section, I share the spatial distribution patterns associated with Sports Areas within my study area. Using the median walking distance taken by participants to get to Sports Areas, the percentage of my study area that lies within or beyond walking distance to a Sports Area is described. I follow this with an identification of which SIMD Quintiles are most and least served by the observed spatial distribution of Sports Areas in my study area, i.e. which SIMD Quintiles are associated with being within and beyond the walkability buffers that surround each open space.

7.5.1 The spatial distribution of Sports Areas

In total, 324 individual Sports Areas were recorded across the urban units included in this study. This equates to an average of one Sports Area per 0.62 km².

The results of two Pearson's correlation coefficients indicated that, in my study area, the size of an urban unit ($r = 0.9653$) was a stronger predictor of the number of Sports Areas present in an urban unit than the estimated total population of a unit ($r = 0.6421$). I found that the number of Sports Areas present in an urban unit is strongly proportional to the size of the unit. As such, the number of individual Sports Areas present in urban units in my study area tends to increase as the size of the urban units increases.

I found that the spatial distribution patterns of Sports Areas within the studied urban units follow a slightly regular pattern. A nearest neighbour analysis yielded a nearest neighbour ratio of 1.194. This ratio suggests that Sports Areas are distributed within my study area in a slightly more regular manner than would occur by chance. Therefore, as was the case with Public Parks & Gardens, the spatial distribution of Sports Areas appears to be somewhat deliberate within my study area.

The number of Sports Areas within an urban unit is proportional to the size of the unit, and they tend to be located at slightly regular intervals across the unit. Therefore, on this basis it would be expected for there to be a high level of equity in the availability of Sports Areas across urban units, despite area-based measures of relative deprivation. I explore whether this is indeed the case in the next section.

7.5.2 Sports Areas and area-based measures of relative deprivation

In total, 178.95 km² of the total studied area was found to fall under the influence of a Sports Area walkability buffer, equating to 89.03%. This is the highest level of coverage of all the open spaces analysed as part of this study. Therefore, I found that Sports Areas are the likely most accessible type of open space via walking in my study area.

However, this study found a notable disparity in access to Sports Areas between SIMD classifications, suggesting that a more regular distribution pattern and high levels of walkability do not necessarily equate to equal availability for all adolescents. Table 7.4 shows the SIMD Quintiles associated with the percentage of my studied area that is beyond walking distance to a Sports Area. As was the case with Public Parks & Gardens and Play Spaces, Quintile 1 was found to be the SIMD classification with the best proximity-based access to Sports Areas in my study area. Of the total area classified as Quintile 1, 98.9% is shown in Table 7.4 to be within walking distance to a Sports Area. Therefore, almost every adolescent living in a Quintile 1 area within my study area potentially lives within median participant walking distance to a Sports Area.

Comparatively, Quintile 3 and Quintile 4 were found have the lowest percentage of their total area being within walking distance of a Sports Area (86.3% and 82.9% respectively). Thus, the most deprived areas, Quintile 1, are shown to potentially have the best access to Sports Areas via walking and moderately deprived areas were found to potentially be least likely to be within walking distance to a Sports Area. As such, I can also suggest that the spatial

distribution patterns of Sports Areas may lead to a proximity-based inequity in access that is linked to specific SIMD Quintiles.

Table 7.4

The amount of area in km² of each SIMD quintile that lies within and beyond a Sports Area walkability buffer in the total area studied.

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total Area
% Area within a walkability buffer	98.9%	88.9%	86.3%	82.9%	87.7%	89%
% Area beyond a walkability buffer	1.1%	11.1%	13.7%	17.1%	12.3%	11%
Total Area in km²	34.13	50.46	37.29	46.75	33.49	202.12

Note. Source: Author's own calculations.

7.6 Civic Spaces

In this penultimate section, I present my findings of the geospatial analysis of Civic Spaces in my study area. In the first sub-section, I describe the spatial distribution patterns of Civic Spaces within my studied urban units. In the sub-section that follows, I identify the percentage of my study area that lies within or beyond walking distance to a Civic Space and identify which SIMD Quintiles are most and least served by the spatial distributions of Civic Spaces, i.e. which SIMD Quintiles are associated with being within and beyond the walkability buffers that surround each space.

7.6.1 The spatial distribution of Civic Spaces

In this study, 47 individual Civic Spaces were recorded, equating to one Civic Space per 4.3 km². The results of a Pearson's correlation coefficient ($r = 0.013$) found almost no relationship between the number of Civic Spaces in an urban unit and the estimated total population of an urban unit, suggesting that population size is not an indicator used in planning Civic Space provision in my study area. In contrast, I found that the size of an urban unit is perhaps a more reliable predictor of the number of Civic Spaces available ($r = 0.6955$), with a moderately strong relationship.

The spatial distribution patterns of Civic Spaces in my study area are decidedly different to the patterns observed for Public Parks & Gardens, Play Spaces, and Sports Areas. For my studied urban units, Civic Spaces were fewer in number or smaller in size than all other types of open space, making a nearest neighbour analysis complex to apply, as in many cases the nearest Civic Space to another Civic Space was in a different urban unit. In addition to this, Civic Spaces offered too few centroids for a nearest neighbour analysis to be reliable.

Instead, the location of Civic Space polygons on the maps created for this analysis was used. From this approach, it was apparent that in cases where multiple Civic Spaces were present in a unit, they were to be found in groups that orbit a town centre, a high street, or an area of pedestrianisation.

7.6.2 Civic Spaces and area-based measures of relative deprivation

In Chapter Five, I found that my participants walk further to access a Civic Space than any other type of studied open space. In the previous sub-section, I identified that special distribution patterns of Civic Spaces in my study area led to strong proximity-based inequities in access to Civic Spaces.

As recorded in Table 7.5, a majority of my study area falls beyond walking distance to a Civic Space. As such, I found that Civic Spaces were the only type of open space where more of the total studied area (62.8%) was beyond rather than within walking distance to the open space of focus. As a result, Civic Spaces were found to be the least available open spaces for adolescents in my study area based on this measure.

Table 7.5 describes the extent to which each SIMD Quintile in my study area is within or beyond walking distance to a Civic Space. 49.3% of areas classified as SIMD Quintile 1 are within walking distance to a Civic Space. Therefore, adolescents living in the most deprived areas of my study area are suggested to be the most likely to have a Civic Space within walking distance from their home. I found that areas classified as Quintile 1 consistently have the highest percentage of their total area within walking distance of each open space. Notably, Civic Space had the lowest percentage of all studied spaces, comparatively.

In contrast, I found that only 27.2% of areas classified as Quintile 4 are within walking distance to a Civic Space. In line with previous findings, Quintile 1 are suggested to be best served by this open space while areas of moderate

deprivation, in this case Quintile 4, are the least served by this type of open space. As such, the spatial distribution patterns of Civic Spaces have been found to lead to a proximity-based inequity in access that is linked to specific SIMD Quintiles.

Table 7.5

The amount of area in km² of each SIMD quintile that lies within and beyond a Civic Space walkability buffer in the total area studied

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total Area
% Area within a walkability buffer	49.3%	42%	42.2%	27.2%	25.3%	37.2%
% Area beyond a walkability buffer	50.7%	58%	57.8%	72.8%	74.7%	62.8%
Total Area in km²	34.13	50.46	37.29	46.75	33.49	202.12

Note. Source: Author's own calculations.

7.7 Key Findings

The findings I have presented in this chapter describe the spatial distribution patterns of Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces within my study area. The SIMD Quintiles associated with areas that fall beyond and within median adolescent walking distance to each type of open space were also shared. The key findings from this chapter are:

- A series of Pearson's correlation coefficients assessed the extent to which there were linear relationships between the numbers of each open space recorded in each urban unit and either the size of each urban unit or the estimated total population of each unit. For Public

Parks & Gardens in my study area, the estimated total population of each urban unit was suggested to be a more reliable predictor of the quantity within a unit ($r = 0.9191$). For Play Space ($r = 0.9619$), Sports Areas ($r = 0.9653$), and Civic Spaces ($r = 0.6955$), it was the size of the urban unit that was suggested to be a better predictor of the quantity of open spaces within an urban unit.

- The spatial distribution pattern of each open space across my study area differed. Public Parks & Gardens were distributed in a random pattern with some uniformity ($nnr = 1.114$), Play Spaces were distributed in a somewhat random pattern with some clustering ($nnr = 0.958$), Sports Areas were distributed in a random pattern with some uniformity ($nnr = 1.194$) and in instances where more than one Civic Space was present in an urban unit they were observed to be clustered together.
- In total, 202.12 km² was studied as part of this analysis. Of this, 70.4% is within walking distance to a Public Park & Garden, 63.1% is within walking distance to a Play Space, 89% is within walking distance to a Sports Area, and 37.2% is within walking distance to a Civic Space. Sports Areas are suggested to have the highest level of proximity-based equity in availability, while Civic Spaces are suggested to have the least. Interestingly, this ranking entirely correlates with the number of participants who visit each space recorded in Chapter Five, where Sports Areas receive the most visits from participants and Civic Spaces

receive the least. These findings suggest that the spatial distribution of open spaces may significantly influence their usage.

- Specific SIMD Quintiles are associated with the areas that lie beyond walking distance to a Public Park & Garden, Play Space, Sports Area, and Civic Space. In all cases, SIMD Quintile 1 was found to have the largest proportion of its total area within walking distance to any open space. This suggests that those living in the most deprived locations are perhaps more likely to live within walking distance to a Public Park & Garden, Play Space, Sports Area and Civic Space. Those living in areas of moderate deprivation were found to potentially be the least likely to have such availability. In all cases, either Quintile 3 or Quintile 4 was found to have the lowest percentage of their total area within walking distance to any open space.

Chapter Eight

Discussion and Conclusion

8.1 Introduction

This study aimed to explore the characteristics and activities associated with adolescent visits to open spaces, the extent to which these visits are associated with subjective health and wellbeing, and whether the distribution of open spaces is associated with spatial measures of relative deprivation. In this chapter, I discuss the findings derived from my four research questions, and I do this through four key themes. These themes are:

- Adolescent use of open spaces reflects the Scottish policy landscape, and they have little control over this
- Guidance on open space provision is inconsistent and problematic for adolescents
- Civic Spaces are important to adolescents and have a unique offering
- Open spaces, *Health and Wellbeing*, and spatial measures of relative deprivation: a puzzle partially solved?

A concluding series of recommendations for policy and practice follow this.

Due to the exploratory nature of this study, a distinct methodology was developed that involved data gathering workshops with 594 participating adolescents aged 12 to 15 that informed a geospatial analysis of my study area. In this chapter, I include reflections upon my research methodology for the benefit of any researchers wishing to engage with large cohorts of children

and young people in education settings in Scotland. This is followed by an acknowledgement of the strengths and limitations of this study more generally. I conclude with a reflection upon how this thesis has supported me in meeting areas of the *Vitae Research Development Framework* (Vitae, 2025).

8.2 Contribution to the field

In my Literature Review I noted that, rather than openly exploring where adolescents choose to go, existing literature in the field tends to focus on how adolescents engage with one particular type of open space selected by the researcher e.g. parks (Gidlow & Ellis, 2011) or urban woodlands (Hegetschweiler et al., 2022), with data collected from participants already on site (Gidlow & Ellis, 2011) or via national surveys (such as the SPACES data set in Scotland, used in McCrorie et al., 2021). To my knowledge, this thesis is the first time that an overview of adolescent engagement with all types of open spaces listed in *PAN 65* is recorded, making it an important contribution to the field. Through my decision to unite terminology and datasets from a range of fields/sectors such as *PAN 65*, *Health and Wellbeing* Es & Os, the SIMD, and the *Scottish Government's Urban Rural Classification*, I frame my work in such a way that it can be used to inform future cross-sector policy and practice in Scotland.

My empirical findings show that my participants' engagement with open space in Scottish urban areas is more varied than what has been previously considered in the literature. The high level of consistency recorded across my

sample representing three regions of Scotland permits me to assert that Scottish urban adolescents aged 12 to 15 are likely to engage with at least one type of open space listed in *PAN 65*, no matter where in the country they live. Open spaces, and particularly Public Parks & Gardens, Play Spaces, Sports Areas, and Civic Spaces, are therefore suggested to be a key element of urban infrastructure for adolescents in Scotland based on the findings derived from my participants. For this reason, gaining a research-informed understanding of how adolescents use open spaces is important. In the subsequent sections of this chapter, I contribute to this understanding.

8.3 Theme 1: Adolescent use of open spaces reflects the Scottish policy landscape, and they have little control over this.

In this section, I discuss how the policy landscape may influence adolescent use of open space in Scotland. It is divided into two subsections. First, I discuss how the intentions of policy in the domains of planning, public health and education may have influenced the characteristics of my participants' open space use. Then, I explore the influence that my participants feel they have over the open spaces they visit, drawing upon the *Health and Wellbeing Es & Os* associated with open space use.

8.3.1 Policy Intentions influence adolescent open space use

My application of Erikson's theory of psychosocial development as a theoretical framework led me to expect 'socialising' to be the primary activity engaged with by my participants in the open spaces they visit. This was due to the role of peer groups and social interaction in advancing adolescent psychosocial development (Benson & Bundick, 2015). However, I found that socialising was the second most common activity, receiving less engagement than physical activity in all open spaces of focus.

This suggests that Erikson's theory of psychosocial development (1950) is not always accurate as a mechanism to understand the motivations of adolescents in certain contexts. There is an argument that Erikson's understanding of human development is oversimplified and is limited by prioritising masculine identities, neglecting sub-identities (Benson & Bundick, 2015). One should also be mindful that it is product of the cultural context in which it was produced. These limitations of the theory may be observed in this instance. The distinct social, cultural, and environmental context of my sample and how this context influences their psychosocial development may not be fully reflected in Erikson's theory. Life for a young person in Scotland during the early 2020's is not the same as the life of a young person in the USA during the early 1950s. In addition to this, the age range of my participants and the intersectionality of their identities may work within these contexts to shape development in a way that does not fully correspond with Erikson's thinking. Based on this, future applications of Erikson's theory of psychosocial

development to understand the motivations of Scottish urban adolescents may need adaption to account for these factors.

This subversion of my expectations may also be the result of successful policy implementation in Scotland relating to open spaces and physical activity. In Scotland, open spaces and physical activity appear to be intrinsically linked. On the first page of *PAN 65*, it is stated that the guidance it provides ‘supports *Scottish Planning Policy (SPP) 11: Open Space and Physical Activity*’. This suggests that for Scotland’s planners, the act of maintaining and creating high-quality open spaces is linked to affording physical activity.

As such, I suggest that there is a purposeful design at play where open spaces are expected to fulfil a specific role. This sentiment is consolidated in *National Planning Framework 4 (NPF4)*, where the Scottish Government states its intention ‘to make better use of our spaces to support physical activity’ (2023b:11). In addition, good access to green spaces is said to improve physical health (p. 30). As an aside, considering that my findings identify Civic Spaces as a significant type of open space for my participants, it is noteworthy that grey spaces are not included in this intention, suggesting that Civic Spaces are a neglected or underrepresented type of open space in this documentation.

The impact of purposeful design is well evidenced in Sports Areas. Sports Areas are defined by *PAN 65* as being: ‘large and generally flat areas of grassland or specifically designed surfaces used primarily for designated sports’ (p. 5). This definition presents these open spaces as intentionally designed to encourage vigorous physical activity. I recognise markers of this

intentional design in my findings. For example, all sports have norms that specify how long they are played for and how frequently training or coaching occurs, dictating how and why Sports Areas are used. These norms align with the observed pattern of how my participants use of Sports Areas in my findings, as described in Chapter Five. The high level of regular visits made to Sports Areas by my participants signifies a commitment to attendance associated with training or coaching sessions, and the duration spent in Sports Areas indicates participation in competitions, matches, or tournaments. As such, a pattern emerges showing that Sports Areas are used by my sample for their intended purpose as set out in policy. This evidence suggests that the purposeful design imposed by adults shapes how these adolescents use of this type of open space.

Several policy documents in the areas of public health and education are also noted to promote open spaces as venues for physical activity. Examples include *A More Active Scotland: Scotland's Physical Activity Delivery Plan* (Scottish Government, 2018a), *Curriculum for Excellence through Outdoor Learning* (Education Scotland, 2010b), the *Cycling Framework for Active Travel* (Transport Scotland, 2023), and *Scottish Government Planning Guidance: Play Sufficiency Assessment* (Scottish Government, 2023d). As such, although created in isolation through different policy silos, it can be suggested that successive policy implementations envisioning open spaces as venues for physical activity have been arguably successful in creating spaces that support or encourage physical activity among participating adolescents in this study.

In this sense, I observe that how the adolescents who participated in my study use open space is influenced by the policy decisions made by adults working in the domains of planning, public health, and education. As a result, their experiences of/in open spaces recorded in this study are suggested to be moulded by adults, reflecting a children's geographies perspective of how children and young people experience place (Ansell, 2009).

Consequently, my research is evidence of the power of policy intentions in influencing how open spaces are used. As such, this study suggests a refinement in how children's geographies scholars understand the power dynamics between adolescents and adults in a Scottish context. While children's geographers suggest that children and young people actively resist adult structures imposed upon them, my study suggests that the way my participants use open spaces is evidence of the systemic and pervasive nature of adult control in this context. By aligning with the expected uses of open spaces outlined in policy intentions, rather than subverting them, it can be suggested that adults are particularly powerful in this relationship. This indicates that there is a need for a more nuanced understanding of power dynamics between adolescents and adults in the context of open space use in Scotland as barriers to participation in decision-making for adolescents in this area may be particularly strong in comparison to other areas.

This situation evokes Bronfenbrenner's ecological systems theory and can be better understood through its application. In this example, local authorities, planning authorities, and public health organisations (members of the exosystem) create and implement policies that indirectly influence

adolescents. In Chapter Six, I found that my participants often visit open spaces with their friends or family. The way these young people directly engage with these groups (the microsystem) in open spaces is suggested to be influenced by the natural or built features present. Examples that afford physical activity were paths to walk or cycle on, and goal posts and grass for playing football. These features are funded, placed, and maintained by the policy and budgetary decisions made by those identified members of the exosystem, and their decisions are influenced by what seems to be an unsaid cultural understanding that open spaces in Scotland are primarily for physical activity (the macrosystem). I found that failing to maintain these facilities leads to negative experiences in open spaces for my participants. In this sense, how an adolescent engages with members of the microsystem and their own subjective experience in an open space is seen to be indirectly influenced by the policy intentions of the exosystem.

My application of Bronfenbrenner's ecological systems theory to understand how policy intentions influence my participants use of open space is useful. The process has flagged the importance of taking account of the direct and indirect nature of how adolescent behaviour can be influenced. It also shows that engagement with open spaces can be a multilayered experience for adolescents that goes beyond a simple linear cause and effect sequence. Rather, it is possible for a number of different influences from different systems to be operating at once. By recognising the influence of policy as a multilayered process, I suggest that there is a need for a holistic approach when working to understand the influences that shape adolescent behaviours in open spaces.

Because this framework helps me to interpret my findings from multiple perspectives, I will frequently apply it in this chapter.

Adolescents have no clear means of engaging with these policymaking groups and are therefore not involved in the creation of these policies that affect their use of open spaces. Due to Scotland's fragmented sub-national governance model, the link between physical activity and open spaces has been independently reiterated in policy at national, regional, and local levels. For adolescents to change policy direction, i.e. for policy to prioritise open spaces to be purposefully designed for another use based on adolescents' needs, it would require adolescents to be involved in several different levels and arms of governance. This is not easy to accomplish, and the current fragmented system would require adolescents to repeatedly express the same concerns individually to representatives of different sectors, making this an onerous and potentially frustrating task for the adolescents involved.

The subaltern status of adolescence in the decision-making processes regarding open spaces is also acknowledged in my *Health and Wellbeing* data shared in Chapter Six. This will be discussed in the next sub-section.

8.3.2 The adolescent voice is not valued

The *Social Wellbeing* Experiences & Outcomes (Es & Os) generally describe outcomes concerned with engagement with the 'school community', 'wider community' and society rather than interaction with peers. A *Social Wellbeing*

outcome was the outcome least associated by participants with their experiences in open space:

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community.

Although open spaces are described as being a ‘public good’ and are intended to be locations that can be openly used by the public (Abbasi et al., 2016), this finding suggests that my participants generally do not believe that they can contribute their views, time, or talents to bring about positive change in their wider community. They do not see their engagement with or opinions of open spaces as being valued by others and do not firmly believe that their contributions are considered when change is proposed or made to the spaces they visit.

Not only does this finding correspond with the view of adolescents in open spaces being seen as ‘intruders’ or a social issue by the rest of the general public (Lesko, 2012), it also illustrates that my participants are aware of their subaltern status in the community and recognise that they have little or no voice or agency when it comes to making positive change. This aligns with the literature base that explores children and young people’s ability to participate and engage in local citizenship or decision-making activities. Young people are described as having few opportunities to contribute their opinion in planning processes (Strachan, 2017) despite already informally participating in everyday life in a number of different ways as service users and local residents (Percy-Smith, 2016).

Framing this finding through Lefebvre's Right to the City, it is apparent to me that my participants are conscious that they do not have the right to participate and appropriate the open spaces in the urban units in which they reside (Demirbas, 2022). My participants see themselves as having little power and agency over how open spaces are shaped. This also reflects the relationship between the adolescent and the exosystem illustrated in Section 8.3.1. Those who are responsible for deciding whose 'views, time and talents' are drawn upon to make decisions about open spaces do not support adolescent involvement or participation.

Consequently, control over the planning or development of open spaces is in the hands of others, and this is observed to indirectly impacts adolescents in this study. This may be the result of cultural perceptions of the role of adolescents in society (a cultural perception forming part of Bronfenbrenner's macrosystem) that includes assumptions about their roles in society and their capacity for meaningful participation or it may be a general reflection of the value placed on participatory policy making by the Scottish Government. While the Scottish approach towards policy making tends to involve iterative consultation processes with stakeholders (Cairney et al., 2016) it is worth recalling that it is stated in *Unlocking the Value of Scotland's Data* (Scottish Government, 2023i) that consultation, rather than more active approaches, is preferred by some areas of the public sector when engaging with the public. Thus, perhaps it is not just my participants who are affected by this stance, but Scottish society as a whole. The extent to which the Scottish public actively participates in policy making is beyond the scope of this thesis, but should such

a study take place in the future, I strongly advise that adolescents are considered as a distinct cohort.

8.3.3 Summary

In summary, adolescent use of open space is suggested to be influenced by policy intentions. These policy intentions promote purposeful design, which sees open spaces assigned particular roles and functions. The current policy landscape in Scotland promotes open spaces to be designed as venues for physical activity. This may be the reason why my participants most commonly engage in physical activity while in the open spaces of focus in this study. Should adolescents wish to change the direction of policy or campaign for open spaces to be intended for a different purpose, then doing so would be difficult. This is due to Scotland's fragmented sub-national governance model which supports many independent actors. The adolescents who participated in this study generally do not see open spaces as a place where they can bring about positive change, nor recognise it as a place where they can contribute their views, time, or talents. As such, as current open space provision does not seem to provide a forum for adolescents to express their views and instead nudges their behaviour in a particular direction (Westin & Joose, 2022), it is difficult to say whether Scottish urban open spaces currently meet the needs or reflect the interests of adolescents.

8.4 Theme 2: Guidance on open space provision is inconsistent and problematic for adolescents

Drawing upon my understanding of the Right to the City (1996), complemented by an understanding of central place theory, I expected that the open spaces most frequented by participants would show the most regular distribution patterns, with a corresponding ranking where the second most visited open space would have the second most regular distribution, and so on. This turned out to be the case.

This finding provides an insight into how urban patterns of distribution align with Lefebvre's (1996) conceptualisations of access and availability. It may be argued that the more regular the distribution of a particular open space across an urban area, the more accessible that type of space becomes. When neighbourhoods have direct access to a type of open space, without competing with adjacent areas for its use, this spatial arrangement may cultivate a sense of local ownership and attachment. This can encourage repeat visits, particularly in cases where residents also participate in how the open space is managed or maintained. Of course, based on my findings it is unlikely that my participants are actively involved in the management or maintenance of the open spaces they frequently visit and this is a caveat when applying the Right to the City in this case. Nevertheless, as the following sub-sections show, the distribution patterns of open spaces do seem to influence how they are used by my participants.

Generally, it is difficult to be confident in whether the current open space provision meets the needs of adolescents. In Scotland, there is no strict national guidance on how many people or what size of an area a Public Park & Garden, Play Space, Sports Area, or Civic Space should serve. Any direction provided is decided by local authorities and this guidance is not easily obtainable. This reflects the lack of rigour in how green infrastructure is treated, identified by Hislop et al. (2019). This means that, due to my study area covering three local authorities, there is no universal metric that can be applied to assess whether participating adolescent use and availability of open spaces align with any benchmark. Nonetheless, based on the disparate documentation available, it appears that the open space provision recorded in my study area does meet individual local authority expectations to a certain degree.

8.4.1 Provision of Public Parks & Gardens

I found that, in the case of my study area, the estimated population size is a better predictor of the quantity of Public Parks & Gardens within a unit than unit size, and this aligns with how provision for this space is measured in local authority guidance. For example, the *West Lothian Open Space Strategy 2020 – 2024* (nd) sets an expectation that local parks, which are a minimum size of one hectare, are to serve a population of 250 – 2000 people. Neighbourhood parks, which are a minimum size of three hectares, are expected to serve 2,000 – 10,000 people. Although my study has a limitation in not considering the size of individual open spaces in the geospatial analysis, my findings allow

me to approximate that each Public Park & Garden in my study area serves a mean of 2,023 people. This figure falls within the tolerance of both local authority expectations. This suggests that there is an appropriate number of Public Parks & Gardens within my study area to accommodate the population and, by extension, accommodate adolescents, should no factor other than proportion share be considered.

8.4.2 Provision of Sports Areas

For Play Space, Sports Areas, and Civic Spaces in my study area, the size of the urban unit was found to be a better predictor of the quantity of open spaces than population size, with larger units tending to contain more open spaces. The spatial distribution patterns recorded for these spaces suggest that this is by design, rather than by coincidence. The slightly regular distribution patterns of Sports Areas suggest that their placement is intended to ensure some form of spatial coverage across a unit. This finding suggests an absence of the uneven development of urban areas discussed in Harvey (1985) as this does not seem to be a spatial distribution that favours the accumulation of capital in certain areas. This indicates that the location of Sports Areas in my study area is not a feature of capital-driven urbanisation and instead may be a feature of a more social-focused planning approach.

Different sources need to be drawn upon to assess whether the provision of these open spaces meets expected benchmarks. Notably, not all of these sources are related to planning. A set of standards for the distribution of Sports

Areas is provided through the Observatory for Sport Scotland (OSS). Their *Guidance for Outdoor Sport and Play Beyond the 6 Acre Standard* (2018) advises that formal outdoor sport areas and playing pitches should be no further than 1200 metres from where people live. My findings suggest that, generally, there is a higher density of Sports Areas within my study area than what is expected in this guidance.

However, a high number of my participants visit Sports Areas by car. While my findings show that the density of Sports Areas in my study area exceeds expectations set in guidance, this does not necessarily mean that all Sports Areas in my study area are readily available to adolescents via independent means. A high level of access by private car indicates that adult involvement is associated more with participant use of Sports Areas than the other three open spaces of focus. Considering that Scottish parents act as gatekeepers to open spaces (Teedon et al., 2014; Turner et al., 2006), that training or coaching sessions tend to occur in the evenings, and that sunset can be as early as 4 o'clock in winter in Scotland, it is reasonable to assume that many parents/guardians prefer to take their child to and from a Sports Area via car for safety reasons.

In addition to this, my geospatial analysis found that some large Sports Areas are located on the periphery of the urban units in my study area, perhaps only accessible by road. Considering that not all Sport Areas are multipurpose, and that some require fee-paying memberships to access, it may be necessary for adolescents to travel long distances to access the type they require. Therefore, because of their purposeful design, associated norms, commodification, and

situation, Sports Areas in my study area facilitate activities that require adult support to participate in. This perhaps leads to adolescents experiencing limited independent mobility as a result.

As such, my findings complicate my applied understanding of Harvey (1985) in this instance. Although the distribution of Sports Areas in my study area does not indicate a capital-driven focus, the monetary characteristics of Sports Areas may limit their access to a certain degree. By requiring memberships, some Sports Areas limit access to certain cohorts of the population. This creates exclusivity and reinforces social and economic divisions by prioritising capital over public services. This commodification of Sports Areas *does* align with Harvey (1985) by arguing that those with financial means have the opportunity to enjoy better services. When applying Harvey's (1985) thinking, one could therefore assume that the distribution of these membership only Sports Areas may reflect an uneven distribution of resources by being predominantly located in high-income areas. However, it is impossible to determine this via the data gathered in this study.

8.4.3 Provision of Play Spaces

The differences between how Play Spaces and Public Parks & Gardens are used by my participants may be due to their differing spatial distributions. The characteristics of visits to Play Spaces and Public Parks & Gardens by my participants are broadly similar, as Play Spaces are often located within the boundaries of Public Parks & Gardens. However, it generally takes a shorter

time for my participants to walk to a Play Space. A reason for this may lie in their spatial distribution within my study area. In my study area, Play Spaces are more plentiful and more clustered than Public Parks & Gardens. In addition to this, Play Spaces are strongly associated with residential areas in Scottish policy. This indicates that there is a higher likelihood of a Play Space being within walking distance of an adolescent's home and a stronger chance that an adolescent will need to walk a shorter distance to access one in comparison to Public Parks & Gardens.

Play Spaces also appear to afford more opportunities for socialising than Public Parks & Gardens. By being smaller than Public Parks & Gardens, I argue that Play Spaces offer a more focused location for adolescents to congregate. When organising a place to hang out, the request to 'meet me at the park' is more likely to require further clarification due to the size of parks, the number of entrances/exits they have, and the variety of environments they contain. In comparison, 'meet me at the playground' is more mutually understood, and the spatial distribution of Play Spaces makes them a more local and recognisable location. This attribute might make Play Spaces more identifiable locations for 'hanging out'.

Guidance for Play Space provision can be found in the *West Lothian Open Space Strategy 2020-2024* and in the Highland Council's *Open Space in New Residential Development* document. In West Lothian, the benchmark is set for all residents to live no more than 500 metres from a Play Space, with Play Spaces intended for adolescents being a 1000 metre walk. In contrast, in the Highland Council, the distance threshold is 600 metres for a local equipped

play area and 1200 metres for a strategic equipped play area. A comparison between these guidelines reveals differing expectations among local authorities in Scotland regarding the management of open spaces.

It is notable that, while not explicitly mandated in policy, some Play Spaces are designated specifically to be used by adolescents. This is achieved by assigning them as places that host what the Scottish Government’s *Play Sufficiency Assessment* (2023d:16) refers to as ‘social play’, i.e. places to socialise and meet with friends and ‘generally hang out’. An example of this provision for adolescents is observed in the West Lothian Council Open Space Audit 2020-2024 (nd), where three different types of Play Spaces are described. It is advised that Local Equipped Area for Play (LEAP) spaces (spaces for children aged 0 – 12) are a maximum 5-minute walking distance ‘as the crow flies’ away from developments, with 10 minutes being the guidance for NEAP spaces (spaces for children aged 0 – 15).

Table 8.1

Different types of open space as listed in the West Lothian Council Open Space Audit 2020-2024.

Play Area Type	Feature
Neighbourhood Equipped Area for Play (NEAP)	For children 0-15
Local Equipped Area for Play (LEAP)	For children 0-12
Local Area for Play (LAP)	Primarily for under-6s

My findings do not align with what is expected in policy. While it can be assumed that some adolescents live within a 5-minute walk of a Neighbourhood Equipped Area for Play space, it is unlikely that all do.

Therefore, although LEAP and LAP spaces are not intentionally designed for adolescent use, it is possible that adolescents nevertheless use them because they are located within walking distance. As my findings did not distinguish between different types of Play Space in my geospatial analysis, this assertion requires further research to verify.

Adolescents' use of Play Spaces that are not intended for them may be controversial for the general public. It can lead to their presence being perceived as disruptive and as an exhibition of anti-social behaviour (Valentine, 2013). I argue that this misconception is perpetuated by the decisions made by authorities that result in Play Spaces designed explicitly for adolescent use (NEAPs) being located beyond median adolescent walking distance.

This relationship can also be understood through Bronfenbrenner's ecological systems theory. In this example, the actions of these authorities are again framed as actions of the exosystem. They create accessibility standards and guidelines that indirectly influence how adolescents are viewed by society. Adolescents are perceived as trespassing in these spaces because local authorities create conditions and contexts in which adolescents are occupying the 'wrong' spaces. This influence is seen in the social media quotes used in Chapter One. Through this lens, these quotes used in my Introduction become artefacts of the mesosystem as adults are interacting with each other online about adolescents.

Through this, a cycle is born where this online discourse feeds into the perception that adolescents are a threat, becoming a force of the macrosystem, which in turn mobilises local authorities (exosystem) to make changes to address what is seemingly a social issue. Adolescents are perceived as trespassing in these spaces because local authorities create conditions and contexts in which adolescents are occupying the 'wrong' spaces. This can be used to further justify the need to manage and control adolescent use of open spaces (Lesko, 1996) and limit their independent mobility. The assertion that adolescents visit Play Spaces that may not be designated for them is significant. This questions the appropriateness of Play Space provision for adolescents in Scotland.

This reading of my findings using Bronfenbrenner's ecological systems theory suggests that the exosystem works, in this case, to preserve and maintain its own power and authority over adolescents and their use of open spaces. By creating conditions that potentially villainise adolescents, it legitimises their exclusion from decision making processes. Although there may not be an intention to consciously preserve the power that adults hold over young people, the current distribution of power is nonetheless maintained. Viewing the exosystem in this case as a mechanism that reinforces hierarchies of power is useful from a children's geographies perspective as it affirms that power relationships between young people and adults are embedded within the systems and structures of society. In the case of this study, this leads to a situation where the omission of adolescents from decision making processes about open spaces is legitimised, normalised and persists.

8.4.4 Summary

In summary, the provisions of different types of open spaces are measured by separate metrics. While Public Parks & Gardens and Sports Areas meet or exceed population or area-based expectations in my study area based on my findings, Play Spaces designed explicitly for adolescents do not. This leads to adolescents potentially using open spaces not intended for them, leading to adolescents (in the eyes of the public) occupying places in which they do not belong. This negatively impacts how adolescents are viewed by their communities, becoming a social issue.

8.5 Theme 3: Civic Spaces are important to adolescents and have a unique offering.

My findings relating to Civic Spaces are significant. The literature base on adolescent use of open spaces in Scotland exclusively focuses on green spaces. This makes my findings on how adolescents use Civic Space a unique contribution to knowledge.

Civic Spaces are also underrepresented in policy. Guidance on Civic Space provision is not featured in any documentation consulted for this discussion and is unlikely to be included in the future, with one document stating:

‘when the audit of open space is carried out Civic Spaces will be audited for quality and accessibility but not in terms of quantity’ (2013:42).

For these reasons, Civic Spaces occupy their own theme in this chapter. Civic Spaces are unusual open spaces in the context of *PAN 65*. They are hard-

landscaped grey spaces that are few, unequally distributed across my study area, and located in the centre of the studied urban units that contain them. Despite these spatial barriers, Civic Spaces are visited by a high number of my participants, and the characteristics of these visits are unique in comparison to other open spaces included in this study.

Of all open spaces of focus used by my sample, Civic Spaces were found to have the highest variety and most equally spread modes of access. This may be a result of their situation. My geospatial analysis found that Civic Spaces in my study area are exclusively located within urban centres. Their presence in areas with many commercial units and few residential units situates Civic Spaces away from much of the population. This may explain why Civic Spaces require the longest walking time for my sample to get to.

This relative distance between Civic Spaces, as an area adjacent to commercial activity, and residential areas provides a practical example of how the forces of capitalism can shape an urban area. Both Lefebvre (1996) and Harvey (1985) provide a framework that can be used to understand how Civic Spaces are organised. Lefebvre argues that urban areas are shaped by social relations and the power held by capitalists and asserts that economic interests dominate and control how open spaces are accessed. The commercial characteristics of Civic Spaces results in them being located in central areas to attract capital. This reflects Harvey's argument that urbanisation is driven by the need to facilitate consumption and accumulation. The separation of Civic Spaces from residential areas in this way reflects a strategy that both segregates people (Harvey argues that segregation is by social class and

while this study cannot verify this, my findings that certain SIMD Quintiles have better access to open spaces than others does point in this direction) and offers potential for commercial activities. Thus, these spatial arrangements are seemingly a result of capitalist forces in urban planning that structure access to the urban landscape according to economic function.

Perceived long distances are recorded as a deterrent to active mobility for adolescents when going to school (Ikeda et al., 2018; Mandic et al., 2020) and my findings suggest that this might also be the case for Civic Spaces. The perceived long distance and the effort associated with walking far may explain why so many participants choose to access Civic Spaces by bus or get dropped off by a private car. It is also notable that the age group of focus in this study are entitled to free bus travel via the *Young Person's Free Bus Travel* scheme (Transport Scotland, nd). Urban centres are often transport hubs, featuring bus stops, bus stations, car parks, pavements, pedestrian crossings, and cycling infrastructure. This makes urban centres, and by extension, Civic Spaces, highly versatile in how they are accessed.

Civic Spaces were also found to have the highest variability in the time spent there by participants, experiencing a lower minimum and higher maximum duration than all other open spaces of focus. Unlike other open spaces, Civic Spaces cannot be physically closed as they do not traditionally have gates, fences, or rigid boundaries. In addition to this, street furniture found in Civic Spaces, such as streetlights and pedestrian crossings, was identified in this study as evoking feelings of safety for some participants. Thus, the conditions exist for adolescents to be comfortably present in Civic Spaces for long

periods, if they want to. As a result, it can be suggested that Civic Spaces are readily available for adolescents to engage in activities that support their psychosocial development, such as hanging out with friends.

My analysis of participant body maps revealed opportunities to 'go up the street' with friends to eat, highlighting a unique facet of Civic Spaces. This trait may influence the characteristics of participant visits to Civic Spaces to a certain degree, facilitating Civic Spaces to be social hubs. This is consistent with findings reported elsewhere. Strachan (2024: 150) identified, when working with young people to identify what they feel is important in their local area, that 'young people's knowledge of which type of takeaways were on the local shopping street were second to none' although they collectively did not recognise food outlets as an important feature of their local area. While food establishments as a physical feature are not seemingly important, perhaps the activities they indirectly afford are of more significance. Neely et al. (2014) record a strong social dimension to food consumption, with shared food practices offering a way for adolescents to integrate into peer groups and strengthen relationships. Murray and Wills (2020) found that the opportunities to socialise created by eating together are more important to adolescents than the act of eating itself, with Kapetanaki et al. (2019) further identifying food as a vehicle for socialising for this age group.

Based on this, I argue that food consumption supports what Erikson identified as the social interaction and sense of belonging sought out by adolescents to further their psychosocial development. The ability for Civic Spaces to offer shared food experiences as reported by participants in this study, therefore,

may be a factor in Civic Spaces being a popular open space for my participants. This would also explain why Civic Spaces were recorded to host higher incidents of socialising than other spaces in this study. This application adds a new layer of nuance to Erikson's theory of psychosocial development (1950). While Erikson generally discussed an adolescent's desire to be a part of social groups and members of communities, this was not explored by Erikson in relation to what activities they can participate in for this to occur. The example I describe enhances understanding by suggesting how participation in an activity, such as communal eating, is an indirect way for adolescents to participate in social interactions and foster a sense of belonging. Perhaps when going 'up the street' for lunch, where my participants choose to go might be a community defining trait.

However, not all adolescents may have equal opportunities to engage with Civic Spaces in the urban units in which they live. The observed distribution pattern of Civic Spaces within my study area necessitates that some participants undertake extended travel to access a Civic Space, an activity that has been found to evoke feelings of anxiety for some participants. These feelings may act as a barrier to travel via bus or car, subsequently deterring adolescents from accessing Civic Spaces and denying them the opportunities to engage in the activities that only Civic Spaces can host. As such, although Civic Spaces are evidenced to be accessed by multiple different means by participants in this study, that does not necessarily support adolescent visits to these spaces.

As this is an exploratory study, my findings present an initial understanding of the importance of Civic Space in adolescent open space use. It also provides an early insight into how and why adolescents use Civic Spaces although this requires further verification. Nonetheless, my findings support an argument for Civic Spaces to be included in open space policy, guidance, and literature as a matter of importance. I encourage further work to be done in this area.

8.6 Theme 4: Open Spaces, *Health and Wellbeing*, and Spatial Measures of Relative Deprivation: a puzzle partially solved?

This study was interested in exploring the extent to which adolescent use of open space is associated with self-reported *Health and Wellbeing* outcomes. While literature maintains that engagement with open space has a positive influence on adolescent wellbeing (Roe et al., 2017), there is a literature gap concerning the types of wellbeing that are best supported by open space use in Scotland. Gaining an understanding of the relationship between open space and adolescent *Health and Wellbeing* outcomes is not only important for contributing knowledge to the field; it also allows room for reflection upon the effectiveness of national policy intentions that promote the use of open space as a health intervention for adolescents. (Scottish Government, 2023b). As such, these findings hold significance for several sectors.

My findings on open space and *Health and Wellbeing* support one of two possible conclusions:

- When adolescents visit a high number of open spaces, they benefit by achieving better health and wellbeing outcomes as a result, i.e. more visits = better wellbeing.
- Adolescents with already high levels of health and wellbeing tend to be more likely to visit lots of different open spaces, i.e. good wellbeing = more visits.

This study has no way of determining the causality of the relationship between a high number of open space visits and high levels of health and wellbeing. However, drawing upon findings from my geospatial analysis, an initial understanding can be gained to serve as a basis for further study in this area.

8.6.1 Do adolescents who visit a high number of open spaces benefit from better health and wellbeing outcomes?

I found that SIMD Quintile 1 areas in my study area consistently had the highest proportion of their total area within walking distance to each type of open space. The distribution of open spaces and green spaces is identified to favour more affluent areas (Macedo and Haddad, 2016; Erkip, 1997; Yi Jian et al., 2021; Tjinh Do et al., 2019; Alderton et al., 2022). My findings, however, did not support this to be the case in my study area. My findings align closer to Mavoa et al. (2015), where it was found that socioeconomically disadvantaged locations were in closer proximity to open space, and Hobbs et al. (2017), where more deprived populations were found to have better park access.

This finding suggests that the arguments provided by Harvey in *Urbanisation of Capital* (1985) may not fully apply to the distribution of open spaces in my study area. Due to Harvey's argument that over accumulated capital is invested in the built environment to support further accumulation, I would expect for more socioeconomically advantaged areas to have better access to each type of open space due to the supposed ability of open spaces to refresh the labour force through leisure and recreation. My findings do not support this argument. However, that is not to say that this has always been the case for my study area, and I suggest that there may be a temporal reason for this divergence. The SIMD is generally updated approximately every 3-4 years with the classifications of data zones sometimes changing between updates. This shows that the socioeconomic context of an area can change over time. As urban areas have grown and changed, it is reasonable to suggest that the accumulation of capital has also changed. The high density of open spaces found in socioeconomically disadvantaged areas in my study area may be a remnant of historical past investments made in a time when these areas had a different socioeconomic context that attracted it.

Concerning area-based measures of deprivation, my study found that SIMD Quintile 1 areas in my study area have the highest percentage of their total area served by each type of open space in comparison to other Quintiles and therefore can be suggested to have better availability of multiple open spaces than those living in other areas. However, this does not necessarily mean that adolescents living in areas classified as SIMD Quintile 1 are using these areas more than others. A limitation of my work is that it does not fully account for

factors that might influence adolescent access to open space and whether these factors differ between socioeconomic contexts. However, there is a literature base that affirms that this can occur.

Mavoa et al. (2015) affirm that open spaces in deprived areas tend to be smaller than those elsewhere, which may raise questions about their capacity to support or afford activities associated with positive health and wellbeing. This echoes Harvey's (1985) concept of residential differentiation, where spatial inequalities result in areas of different socioeconomic status receiving different investments in their built environment, resulting in different levels of access to amenities. In McMinn et al. (2020), it is stated that, even though disadvantaged groups may have access to health-promoting facilities, this does not necessarily mean that individuals are empowered to use them to improve their health. Likewise, Macdonald (2019) found that an income-deprived sample of adults were only willing to travel half the distance to access leisure facilities than their more affluent counterparts. Should I have reduced the walkability buffers used in my study to account for the findings shared in Macdonald (2019), it is certain that my results would have been impacted. However, due to ethical reasons it would not have been possible to gather data on the address of each participant and the SIMD Quintile associated with each address. Therefore, this adjustment would not have been possible to make.

Based on my findings, it could be suggested that adolescents living in the most deprived urban areas of Scotland *should* report better health and wellbeing outcomes than those living in other socioeconomic contexts. However, the opposite is known to be true in Scotland.

It is well documented that children and young people living in the most deprived areas in Scotland have poorer levels of wellbeing than their counterparts in different socioeconomic contexts. The Scottish Government report on data from the *Scottish Adolescent Lifestyle and Substance Use Survey* (2015) identified that, for adolescents aged 13 and 15, higher levels of deprivation were correlated with poorer mental health and wellbeing. A deprivation-based gap was also identified in Scottish Government's *Factors affecting children's mental health and wellbeing: findings* (2020), where 4% more Scottish secondary school students living in the most deprived areas were found to have emotional problems. This is echoed in Inchley et al. (2023b), where it is identified that adolescents living with high levels of deprivation report more mental health complaints than their peers. Therefore, although adolescents living in areas classified as SIMD Quintile 1 were found to have more open spaces available to them in this study, it is unlikely that this opportunity is translating into high acquisition of health and wellbeing outcomes. This raises the question: if open spaces do support health and wellbeing, why are they not effective for deprived adolescents?

Open spaces in deprived urban areas contain deterrents that may prevent adolescents from using them. One such deterrent is anti-social behaviour. In Scotland, reports of incivility are more common in deprived neighbourhoods (Scottish Government, 2025d) and in other contexts, incivilities are more commonly associated with open spaces in deprived areas in comparison to others. Hobbs et al. (2017) found that parks in deprived areas of Yorkshire had the most incivilities (auditory annoyance, broken glass, dog waste, unattended

dogs, alcohol use, substance abuse, graffiti, litter, overgrown grass, and vandalism) compared to parks in more affluent areas.

My thematic analysis of participant body maps revealed occurrences of anti-social behaviour and low-quality, poorly maintained facilities in open spaces, suggesting that the deterrents identified in the literature may also be influential here. These features were all associated with negative emotions by participants. As incivilities such as these are more likely to be recorded in deprived open spaces according to literature, it is reasonable to assume that adolescents living in SIMD Quintile 1 areas may experience more deterrents to open space use. Therefore, although they seem to have a greater opportunity to access all types of open space and *should* perhaps experience higher levels of health and wellbeing because of this, they also likely encounter a higher number of barriers to using their local open spaces. Therefore, it is not always possible for adolescents living in areas classified as SIMD Quintile 1 to access their local open spaces, making it more difficult for potential benefits of being in open spaces to be actualised.

8.6.2 Do adolescents with good health and wellbeing visit more open spaces?

In the context of this study, it is perhaps more plausible that participants with already high levels of health and wellbeing tend to visit more open spaces as a result. This may be due to adolescent confidence levels. There is evidence that adolescents with higher levels of health and wellbeing also tend to be more

confident (Moksnes & Reidunsdatter, 2019; Naderi-Lordehani et al., 2019). This confidence may facilitate higher engagement with different open spaces. In their study of Swedish teenagers, van der Burgt (2013) found that participants who reported high levels of personal confidence often translated this into spatial confidence when navigating public spaces, using peer networks to assuredly identify where to go and where to avoid.

Drawing upon Erikson's theory of psychosocial development as a lens to understand the relationship between spatial confidence and peer relationships, a symbiotic relationship emerges. Adolescents gain social validation and a sense of self through peer interactions, which in turn foster feelings of belonging, security, and self-confidence. According to van der Burgt (2013), this sense of self-confidence extends into spatial confidence when the adolescent engages with open spaces. If the adolescent encounters anything newsworthy in an open space, they share it with peers, helping others know where to go and where to avoid. This process of peer-to-peer communication continues to foster self-confidence. Those who share information are validated and appreciated by peers, and those who receive this information feel protected by peers. As such, it can be assumed that high self-confidence and the associated spatial confidence developed through peer interaction enhance adolescents' ability to access multiple open spaces. This application serves as a further extension of Erikson's theory as it connects identity development with environmental factors in a more detailed manner. While Erikson originally focused on identity formation through interactions with peers, my application broadens that concept by integrating spatial confidence into the psychosocial

development stage of adolescence. Not only do I believe that this deepens our understanding of how adolescents may form their identity, but it also flags the dynamic relationship between the social and spatial contexts in which it is formed.

8.6.3 Which category of *Health and Wellbeing* is most associated with open space by adolescents?

I had conflicting expectations about which category of *Health and Wellbeing* my participants would most associate with their use of open space. One expectation was that *Physical Wellbeing* would be the most highly selected area of *Health & Wellbeing*, given that physical activity was found to be the most common activity engaged in by participants in my four open spaces of focus. Considering that physical activity and exercise are commonly associated with lowering stress levels and the production of mood-boosting endorphins (National Health Service, nd), I also expected *Mental & Emotional Wellbeing* to be strongly associated by my sample with open spaces use. On the other hand, the importance of peer relationships for adolescents suggests that *Relationships Es & Os* could be the most significant. As such, a tension was identified where several forms of *Health and Wellbeing* can be reasonably suggested to be most associated with open spaces. My findings play an important role in dissipating this tension by clarifying which category of *Health and Wellbeing* is most associated with my participants' use of open space.

Mental and Emotional Wellbeing was the least consistently and comprehensively selected *Health and Wellbeing* category by participants who visit open spaces. This finding contradicts the myriad of literature and policy that aligns engagement with open space (green space) with positive mental health (Howlett et al., 2025; McCormick, 2017; Zhang, et al., 2020; Callaghan et al., 2020, Vanaken & Danckaerts, 2018). However, that is not to say that green open spaces do not have an impact on adolescents. I cannot deny the restorative effects of natural environments or disprove the notion of ‘green health’ that has come to prominence in the domain of public health in Scotland. My thematic analysis of body maps identified the natural world as highly restorative for participants by affording feelings of calm, happiness, and safety.

However, it is notable that very few participants in this study visited open spaces to bathe in nature. Therefore, while some of my participants experience restorative effects when in open spaces, they generally do not seem to choose to access open spaces for restoration. This may have resulted in fewer *Mental and Emotional* outcomes being selected.

Interestingly, despite this, a *Mental and Emotional Wellbeing* E & O was the outcome most frequently indicated by participants to be associated with visits to public open spaces:

‘I know that friendship, caring, sharing, fairness, equality, and love are important in building positive relationships. As I develop and value relationships, I care and show respect for myself and others.’

Although this outcome is categorised as a *Mental and Emotional Wellbeing E & O* by Education Scotland, mentions of ‘friendship’, ‘positive relationships’ and ‘value relationships’ are social themes associated with peer groups, social networks, and socialising. This suggests that these social themes are associated with my sample’s engagement with open space.

Therefore, it is not surprising that the set of outcomes that were found to be most associated with experiences in open spaces by participants in this study were those associated with *Relationships*. This is a category that describes wellbeing outcomes related to interpersonal relationships. The themes of ‘friendship’ and ‘positive relationships’ within the *Mental & Emotional Wellbeing E & O* are perhaps central to its strong association with open spaces for my sample. Its frequent selection by participants is consistent with my finding that *Health and Wellbeing Es & Os* relating to *Relationships* are more commonly associated with my participants use of open space.

This finding suggests that the most common outcomes associated by my sample with their use of open spaces are sustained friendships and other relationships, the support of the health and wellbeing of others, and the development of communication skills. Significantly, this implies that my participants themselves recognise that open spaces are important to their wellbeing and the wellbeing of others. This focus on friendships aligns with findings in other studies. Viner et al. (2012) recognise that interactions with peers are key in supporting adolescents in achieving positive health outcomes and Gidlow and Ellis (2011) observed that adolescents used a public park as a place for congregating and socialising. However, it is noteworthy that I did

not find socialising to be the dominant activity taking place in open spaces in this study. This raises the question: why are peer-based wellbeing outcomes the most recognised by my sample when socialising was not the most common activity taking place in the open spaces they visit?

I argue that physical activity, the primary type of activity taking place in the open spaces studied, can evoke recognition of these *Relationships* outcomes. For instance, vigorous physical activities, such as team sports, are associated with developing teamwork, communication and fostering bonds between teammates by supporting feelings of empathy (Kwon, 2018). These actions relate to the *Relationships* set of outcomes. On the other hand, moderate physical activities such as going for walks and cycling can be either solo or group endeavours. A solo activity may foster a sense of appreciation for being on your own and respecting your own space and the personal space of others. A solo activity also provides opportunities for verbal and non-verbal communication, such as acknowledging a passerby as you travel or engaging in small talk with friends, family friends, or others as they are encountered.

The informal group games or activities listed by participants in their body maps, such as dancing, doing flips, playing football, biking, going for walks, and 'running about', likewise may offer opportunities to communicate and build positive relationships through shared experiences and memories. The shared sense of place potentially created by these activities may result in an open space becoming a 'field of care', i.e. a place that inspires feelings of affection and safety (Cresswell, 2011; Tuan, 1979). This may provide a reason as to why participants reported feeling calmness, excitement, safety, happiness, and

fun when engaging in these activities in the open spaces they visit. Perhaps this sense of place created with others, when brought to their minds during the data gathering workshop, was maybe understood as a feeling of wellbeing by participants in this study and was recorded as such, resulting in these findings.

8.6.4 Summary

In summary, this study found that there is a positive relationship between the number of open spaces used by individual participants and the number of *Health and Wellbeing* outcomes associated with experiences in open spaces. However, the primary driver of this relationship (i.e. whether more open spaces equal better wellbeing or whether better wellbeing supports higher engagement with open space) could not be confirmed. Participants mostly associated open spaces with the maintenance of positive relationships and friendships and, as such, can be suggested to play a role in supporting their psychosocial development via peer interactions to a certain degree.

This study also found that *Mental and Emotional Wellbeing* was the form of wellbeing least frequently associated with open space use among participants. Considering that 49% of Scottish young people report experiencing multiple mental health complaints every week (Inchley, 2023b) and that the Scottish Government supports the use of learning outdoors as a mechanism to promote good health and wellbeing in young people (Scottish Government, 2023c), these findings may suggest that, within my sample, open spaces in Scottish

urban areas are not consistently associated with positive outcomes in all areas of *Health and Wellbeing*.

Based on these findings, it is recommended that adolescents are not just consulted by policymakers. Their 'views, time and talents' should be drawn upon to begin a process that improves the open spaces they visit. Currently, adolescents in my sample generally do not believe that their views are valued. Therefore, work needs to be done to create a climate where their inputs are recognised. Considering that the United Nations Convention on the Rights of the Child is enshrined in Scots law, I suggest that now is the perfect climate for this process to begin in Scotland.

8.7 A discussion of those who do not visit open space

My findings highlight that there is a cohort of participants who do not engage with any of the eleven types of open space listed in *PAN 65*, a cohort that has yet to be studied in a Scottish context. Although research on this cohort was outside the scope of this study, data from participant body maps and my geospatial analysis can be used to hypothesise reasons why these adolescents do not engage with *PAN 65* open spaces.

Of the 33 participants who reported not visiting open spaces, 20 were from West Lothian (7.8% of that sample), 12 were from North Lanarkshire (5.1% of that sample), and one was from the Highland Council (.95% of that sample). The relatively higher proportion of participants in West Lothian and the lower proportion in the Highland Council may be attributed to several factors. These

patterns may reflect subjective perceptions of the built environment that influence participant behaviours. These may include the quality of the available open spaces, perceptions of safety, or the extent to which local open spaces contain facilities that support an individual's preferred hobbies or interests. However, given the small number of participants in this group, and the fact that this study focused on the distribution of open spaces across a broad study area rather than within specific local authority contexts, these interpretations are speculative and highlight the need for further localised research in this area.

My thematic analysis of participant body maps suggests that open spaces can be intimidating places for some participants. Open spaces have the potential to harbour scary animals, present situations where adolescents feel their safety may be compromised, and be spaces where bullying may be witnessed. In addition to this, my geospatial analysis unveiled that not all urban areas are within a reasonable walking distance to certain types of open spaces. Participants may be deterred from visiting open spaces due to these social and physical barriers.

Studies support these assertions while also recognising other barriers that may be in play such as parental restrictions, online communication replacing the need to meet friends in person, spaces being poorly designed for adolescent use (Akpınar, 2020), a lack of facilities being available for unrestricted use, and social norms and expectations of who belongs in certain types of spaces making adolescents like they don't belong (Hjort & Højbjerg Larsen, 2025). It is also possible that this group of participants simply visit other types of spaces

that are not part of the *PAN 65* typology. They may be avid visitors of beaches (blue spaces) or regularly participate in hill walking (wild spaces). Just because an adolescent does not engage with open space as classified by *PAN 65*, it does not necessarily mean that they do not engage with outdoor environments at all.

Overall, I am mindful that, as this cohort was not the focus of the study, the explanations provided are inferred from data gathered elsewhere in this study. Further research into this cohort and their relationship (or lack of) with open spaces is recommended.

8.8 Recommendations

This section outlines a set of recommendations for policy and practice in the fields of planning, public health, and education. These recommendations are derived from my discussion of the findings of this study.

8.8.1 Recommendation 1: A call for further research

To my knowledge, this study is the first to explore the characteristics and activities associated with adolescent visits to open spaces: the extent to which these visits are associated with subjective wellbeing, and whether the distribution of open spaces is associated with spatial measures of relative deprivation. As this was an exploratory study, the findings derived from my

research naturally unearthed several avenues for further research in this area.

- The study area for this research included 14 urban units across three of Scotland's 32 local authorities. While the findings of this study are generalisable, it is recommended that further research of a similar nature is conducted in other areas. There is a lack of consistency between local authorities regarding the expectations and benchmarks set for open space provision. Repeating this work in other areas would significantly contribute data to set and harmonise standards for open space access for adolescents across Scotland.
- Theme 4 suggested two possible conclusions: either participants who visit more open spaces achieve more health and wellbeing outcomes as a result, *or* participants with better health and wellbeing tend to visit more open spaces due to higher levels of spatial confidence. I encourage further research to identify which is the case.
- Adolescents in this study were found to value Civic Spaces. However, Scottish literature that recognises Civic Space as a form of open space is highly limited and no guidance or benchmarks for Civic Space distribution in Scotland were found. There is a need for further research on adolescent experiences of Civic Spaces, particularly through the lens of *PAN 65*, to inform the creation of appropriate accessibility and distribution benchmarks.

- This study did not explore how adolescent use of open space changes depending on the time of day, day of the week, or seasonally. The findings from my thematic analysis suggest that there may be some temporal variations in how adolescents experience the studied open spaces. Herein lies an opportunity for further research.
- While this study explored whether the distribution of open spaces was associated with area-based measures of relative deprivation, it did not explore whether there were differences in the characteristics of open space visits or differences in associations with *Health and Wellbeing E & Os* between SIMD data zones. This was due to the ethical issues associated with participants disclosing their addresses. Nonetheless, this is an area yet to be explored in a Scottish urban context.
- This study found that SIMD Quintile 1 areas have the highest availability of the four types of open spaces most utilised by my participants. Previous studies of adult populations have found that the quality and size of these spaces, along with social factors, limit the extent to which open spaces are used. A natural next step is to explore whether this is also the case for adolescent populations. In addition to this, there is a gap in knowledge relating to how moderately deprived adolescents engage with open space.

As this section suggests, the field of study relating to urban adolescent use of open spaces in Scotland is ripe for further research. Adolescents are underrepresented in open space research, and I look forward to seeing how

this emerging field develops in the future through my work and the work of others.

8.8.2 Recommendation 2: A call for engagement, consultation, and participation with adolescents when policy making

Drawing upon Bronfenbrenner's ecological systems theory as a theoretical framework for this study, several examples of the current planning process in Scotland forming part of the exosystem, a force that the adolescent is not an active participant in but is nonetheless impacted by, were identified. Phase One of the study uncovered that the *Health and Wellbeing* outcome least associated by participants with their use of open space was:

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community

This suggests that few participants in this study feel their voice is heard in matters pertaining to their open space use, that they have little opportunity to initiate change-making activities, and that they feel like they have little influence on their wider community.

The *National Planning Framework 4* (2023b:13) endorses 'that young people must play an active role in planning', making explicit mention of the UN Convention on the Rights of the Child (UNCRC). The UNCRC (Incorporation) (Scotland) Act 2024 makes Scotland's commitment to this very clear, placing legal obligations on public authorities to respect the rights of children and young people. Based on my findings, this has yet to be actualised.

Participants were reported to visit all types of open space listed in *PAN 65* to a certain degree. An open dialogue needs to be created where adolescents are given the time and opportunity to engage with the processes that shape the open spaces they visit. They should be consulted on any proposed changes and encouraged to participate in the process. Additionally, their involvement in local governance should be fostered. These aims could be achieved in a number of different ways, such as by projects that embed planning related opportunities in the school curriculum (Strachan, 2017), funding opportunities for localised place-based enquiry and peer learning (Percy-Smith & Burns, 2013), or through youth-centred community learning events designed to foster involvement in community initiatives (Percy-Smith, 2021). Through this they will regain what Lefebvre describes as their Right to the City through participation.

The opportunity for Scotland to be a global leader in this area should not be understated. With the incorporation of the UNCRC into Scot's law in July 2024, Scotland became the first devolved government in the world to do so. Under Article 12 of the UNCRC, every child has the right to be heard in matters affecting them and to participate in the life of their family, community and society. Thus, adolescents have the right to contribute their views and participate in bringing about positive change in their wider community by law. As such, it should be seen as a priority for planning authorities to engage with adolescents, perhaps by engaging with schools where children's rights are already an area of focus. Engaging with schools in this way will serve to break some of the barriers identified by Freeman (2018).

Considering that the E & O relating to this activity was the least associated with open space use by adolescents, this should be recognised as a stark warning that current systems and processes are not successful in meeting or identifying the needs of adolescents.

8.8.3 Recommendation 3: A call for reframing the health and wellbeing supports associated with open space

Open space, and in particular green space, is recognised as a mechanism that can support positive mental health and wellbeing by the Scottish Government in national-level action plans (2023c) and guidance (2019). This sentiment is also found in sector-specific initiatives in the domains of public health, planning, and education. This study, when focusing on an adolescent population, did not draw the same conclusion. It was found that *Mental and Emotional Wellbeing* outcomes were the least associated by my sample with their experiences in open spaces. On this basis, any plan to use open spaces as a mechanism to actively target the *Mental and Emotional Wellbeing* of adolescents may need to be reconsidered. This study suggests that open spaces in Scottish urban areas are not consistently associated with this in their current form.

This recommendation is significant once it is considered that leisure services, neighbourhoods, green spaces, and nature form part of the environmental dimension of health outlined in *Scotland's Mental Health and Wellbeing Strategy* (Scottish Government, 2023a). While I found that features of the

natural environment tend to have a restorative effect for my participants, I also found that very few participants visit open spaces to engage with nature, preferring instead to partake in physical activity or socialise. Based on this, I argue that the environmental dimension of health and wellbeing used in *Scotland's Mental Health and Wellbeing Strategy* currently perhaps does not fully reflect the activities that adolescents engage with in open spaces. Therefore, the strategy may not sufficiently reflect the goal of 'improving the mental health and wellbeing of everyone in Scotland' (2023a:4) as the experiences of adolescents recorded in this study are not fully represented in this statement and it cannot be stated whether engaging in these environments improve the mental health and wellbeing of adolescents.

I acknowledge that any proposals to redevelop open spaces to become better associated with *Mental and Emotional Wellbeing* by adolescents would be costly for local authorities. Instead, I suggest that focus should be placed on the qualities of open spaces shown in this study to be already recognised by adolescents, with an expectation that a domino effect can be created. I found that the urban adolescents who participated in this study primarily associated their open space use with *Health and Wellbeing* Es & Os related to interpersonal relationships. Building upon this strength could be a wise investment in the health and wellbeing of a future adult population.

Once adolescents begin participating in decision-making exercises with local authorities as an entry point, as advised in Recommendation 2, open spaces can begin to be modified by and for adolescents to maximise the ability of open spaces to afford or become a host for preexisting positive friendships and

relationships. Good interpersonal relationships may foster a sense of community, and this, coupled with a new approach that records the view of adolescents, would solidify this cohort as a contributor to society and effective members of the community. This would help fulfil their psychosocial needs and, according to Erikson (1950), foster a successful transition into adulthood.

The sense of esteem gained through meaningful participation in decision-making processes may lead to a higher association of open spaces with *Mental and Emotional Wellbeing*. In addition to this, a sense of community, strong interpersonal bonds and feelings of agency in turn may lead adolescents to associate open spaces with *Social Wellbeing*. While this would not be an immediate process and further work is required to formalise this model, I expect it would result in a positive impact once implemented.

8.8.4 Recommendation 4: A call for educators to reconsider their relationship with open space and the Experiences and Outcomes

As mentioned in the Introduction of this thesis, the current educational landscape in Scotland places a lot of importance on relationship building. This sentiment is found in the General Teaching Council for Scotland's Standards for Registration (2021) at all levels, wherein teachers are expected to foster positive relationships throughout their learning community. Notably, there has been a rise in school-based violence in Scotland, with 29,180 incidents recorded in the 2022/23 academic year (STV, 2024). In this study, participants associated open spaces with outcomes related to friendships and

relationships. Education professionals may wish to consider the potential of open spaces as a context in which relationship building can occur between and among teachers and learners.

This initiative would serve as a preventative measure in response to issues surrounding school-based violence and breakdowns in communication between peers. Already, there is evidence of outdoor and adventure education experiences being used by schools in Scotland as an intervention to support learners to develop teamwork skills, bond as a group and support vulnerable young people who display distressed behaviours in school environments (Education Scotland, 2025). However, costs are associated with these experiences, which act as a barrier to their use as an intervention. Using local open spaces within walking distance of a school community as a free alternative to host interventions of this nature can have a myriad of positive effects; namely by supporting *Relationships based Health and Wellbeing* experiences and outcomes, by introducing adolescents to a positive experience of an open space that they may otherwise have been indifferent to or thought negatively of, and by engaging adolescents with place making processes which have been suggested in this study to perhaps support positive health and wellbeing.

This recommendation aligns with the principles of *Curriculum for Excellence*, which strongly advocates for regular outdoor learning experiences to be a part of a young person's school experience. Outdoor learning forms part of the cross-curricular area of Learning for Sustainability, a concept unique to Scottish education that also includes education for sustainable development

and global citizenship education. Like relationship building, learning for sustainability is also explicitly mentioned in GTCS standards (2021). It is conceptualised as the responsibility of all practitioners and is expected to be embedded in professional practice. Therefore, open spaces have an untapped potential to support teachers in fulfilling their professional standards in multiple ways, while also supporting learning outcomes for adolescents in tandem. I recommend using as such.

8.9 Reflections on my methodology

This exploratory study used a sequential mixed methods approach that consisted of two phases. This involved collecting primary qualitative and quantitative data from adolescents through data gathering workshops held in Scottish schools, followed by a geospatial analysis led by participant responses. This section provides a reflection on Phase One of this methodological approach, offering insights for those who may wish to engage in research with adolescents in this manner.

8.9.1 The research access process

In Scotland, the role of delivering education services is entrusted to local authorities. As part of this role, local authorities have a duty to protect children under their care during the school day and adhere to current child protection and safeguarding policy. As such, they are the gatekeepers of research access to schools. In this section, I will describe the processes undertaken to gain

research access and the current opportunities and barriers that can be faced by researchers not employed by local authorities.

Once a researcher, whether post-graduate or otherwise, gains ethical approval for their study from their higher-level institution, current processes dictate that they cannot simply approach an individual school to gain access to children as research participants. Instead, the researcher must first gain research approval from the relevant local authority. In Scotland, gaining research access to children and young people in schools is a four-stage process, as illustrated in the flow diagram in Figure 8.1:

Figure 8.1

The process to gain research access to children in Scottish schools



Note. Source: The author's experience.

Researchers who are not familiar with the context of Scottish education who wish to conduct research in schools for the first time may not be aware of this process. Due to the scope of this study, 16 of Scotland's local authorities were contacted seeking research access. From my experience, each local authority had a different application process. Some local authorities required certain documents, such as PVG certificates, to be dated within a certain time frame. Others required Participant Information Sheets to be in a specific format. It was common for applications to request an explanation as to how the study contributed to their local authority priority areas. Review periods differed

between local authorities, with one taking seven months to grant or deny research access. As such, it can be challenging to maintain a consistent approach to data gathering.

Conducting data gathering activities in schools can be very convenient. Depending on the scope of the study and the characteristics of the school itself, it can provide a convenient sample that can easily be stratified to represent several age groups and socioeconomic backgrounds. Schools also inherently offer a structured environment in which to schedule activities and preestablished child protection protocols for the researcher to follow. However, I can see how this lengthy research access application process would be a deterrent for researchers wishing to engage with large cohorts of young people. In light of this, I now understand one reason as to why so many Scottish-based studies that explore open spaces draw upon data sets such as Studying Physical Activity in Children's Environments (SPACES) (ScotCen Social Research, 2023). Gaining research access to conduct empirical studies with large samples of young people is difficult. For instance, in my study, although I sought to work with 16 different local authorities, this process ultimately yielded three participating schools. This reality is one that researchers need to be aware of, should they wish to replicate this study in other areas of Scotland.

Conducting research in schools is promoted by the Scottish Government. The Scottish Government's *School Research Plan 2023-2026* (2023g:2) 'sets out priorities for research and research activities which will support the Scottish Government to deliver evidence informed policy making in school education'.

While it is appreciated that evidence-informed policy making is a priority for the Scottish Government, it is clear from my experience that current procedures are a barrier to independent researchers contributing knowledge and evidence to inform policy. This is problematic. Current education policy strongly advocates for research-informed practice in Scottish schools, but education services make this difficult to actualise.

This current research access process does not reflect what is advocated for in current school improvement and self-evaluation frameworks by Education Scotland, the Scottish Government agency responsible (at the time of writing) for quality and improvement in Scottish education. This is evident in *How Good is Our School? 4* (Education Scotland, 2017). This document advises a 'looking inwards, looking outwards, looking forwards' model of self-evaluation for schools. Looking outwards involves 'learning from what happens elsewhere to challenge our own thinking' (2017:9). From my research experience, I can assert that the research access procedure currently presents a challenge to those wishing to complete comparative studies that compare outcomes between different schools or local authorities. This is because there is no guarantee that two local authorities or even two schools within the same local authority will grant research access.

Of course, it is the right of schools and local authorities to deny access, and I support this. However, denying access creates a barrier to adopting a research-informed approach towards 'looking outwards'. This may therefore stunt school improvement, professional development, and limit the ability to produce research-informed literature based on a devolved Scottish educational context.

Following the announcement in 2023 that Scotland's educational Regional Improvement Collaboratives (RICs) were to be divested financially, I argue that there is now a greater need than ever for independent researchers to fill this void, as collaboration between local authorities will no longer be funded by the Scottish Government.

The Scottish Universities Insight Institute project, *An Ethical Framework for Research-Practice Partnership* (SUII, 2023), which seeks to align research access criteria and processes across Scotland's local authorities is welcomed. Amongst other things, the project sets out to bring stakeholders together to discuss their interests and concerns about research activity in schools and agree on guideposts for ethical approval. While this project is still in progress at the time of writing, I hope it will help reduce the barriers I experienced. This will benefit not only those engaging with adolescent cohorts in education settings but also Scottish education as a whole.

8.9.2 Data gathering workshops

I conducted data gathering workshops in three Scottish secondary schools. My status as a registered teacher with the General Teaching Council for Scotland and membership of the PVG scheme allowed me to be flexible when planning how the workshops will take place in each setting. It is necessary to reflect upon this process, should a researcher wish to work with children and young people similarly.

Upon reflection, there are specific characteristics that are beneficial when conducting data gathering events in Scottish secondary schools. Based on my experience, I recommend the following:

- All data gathering events took place during timetabled school periods and, as such, provided minimal disruption to the school day. I see this as an essential factor in being permitted to gather data in each school as it worked within school structures.
- Schools are busy places, and teachers are busy people. Any prospect of a research project adding to teacher workload is unlikely to gain research access. The capacity of the researcher to independently deliver workshops with little teacher involvement is therefore an asset when conducting research in Scottish schools.
- Working with individual class groups is most beneficial, particularly if working in their usual classroom. You gain the benefit of the class teacher being present to manage behaviour and pastoral issues. Support for learning assistants can also be present to ensure that those wishing to participate can do so thoroughly.
- Having a 'key contact' in the setting is vital for facilitating data gathering, navigating timetables, and distributing participant information sheets. The role of the key contact may influence when and where your data gathering occurs, e.g. a curricular principal teacher may organise them during curricular periods, while a pastoral staff member may organise them during pastoral periods. While not found to be the case in this

study, this may influence how participants view a study and influence the responses they provide.

8.10 Strengths and Limitations

I acknowledge that this study has several strengths and limitations:

One strength lies in the methodological approach of this study. This research employed a sequential mixed methods design, utilising innovative methods to collect both qualitative and quantitative data. Every element of this data gathering process is repeatable, meaning that others can further this exploratory research. I invite further research using my methodology to be undertaken in other urban units in Scotland to add to the field.

The use of open-source data produced by the Scottish Government in Phase Two of this study is a strength. It opens opportunities for my findings to be related to other studies that use or will use the Scottish Index of Multiple Deprivation or the Urban-Rural Classification Index. This increases the potential impact of this study. In addition to this, reliability is secured by these sources of verified secondary data, and I also see this as a strength of this study. Furthermore, the use of established policy frameworks such as *PAN 65* and the Es & Os provides a successful example of how seemingly disparate areas of public policy can be integrated, opening a door for future cross-sector working.

My identity as a researcher, educator, and geographer is a strength. This intersection has afforded me the ability to navigate the fields of interest in this

study and the skillset necessary to devise the sequential mixed methods approach that I used. I also suggest that this intersection of identities allowed for this research area to be identified. My previous role working with adolescents in education settings, my awareness of the inequities that adolescents can experience, my research interests relating to sustainability and place-based education, and my interests as a human geographer allowed me to be best placed to conduct this research.

A key distinction of this study, compared to other research on open space distribution, is my involvement with young people and my aim to incorporate their responses directly into shaping a phase of this study. This has led to a study that reflects the experience of Scottish adolescents in urban open space like no other has before. In this sense, this research is a unique contribution to the field.

My status as an individual part-time EdD student can be seen as a limitation. This study was ambitious, and my methodology was time-consuming. Completing this research as part of a team would have been more efficient. It would have enabled the inclusion of more local authorities and supported with a greater number of participants. However, the consistency in approach that can only be brought about by a solo investigator is a strength that could only be replicated by a team through training on data gathering and indoctrination into a particular approach towards data analysis.

Limitations also exist in the findings of this study. I did not control for socioeconomic differences in participant responses or differences due to any

other characteristic. In addition to this, I am mindful that the Scottish Index of Multiple Deprivation is calculated using averages. Therefore, my findings related to particular SIMD areas may not apply to all adolescents living within a data zone.

The lack of a literature base relating to adolescent use of open spaces in Scotland is a limitation of this study. Comparing findings to either international examples, adult examples, or child examples is not ideal. However, this is the reality of the field, and the lack of preexisting research further emphasises the need for this study.

Finally, the use of the *Health and Wellbeing* Es & Os as a subjective measure of health and wellbeing is a limitation of this study. While there is a rationale for how they were applied in this research, the Es & Os are ultimately a curricular tool that serve as operational guidance for teachers. They were not designed for research purposes. As such, the list of *Health and Wellbeing* Es & Os do not have theoretical alignment with validated health and wellbeing scales, such as the *Warwick-Edinburgh Mental Well-Being Scale* (The University of Warwick, nd.). Because of this, findings derived from the Es & Os cannot be easily compared with the outcomes of other measures. In addition to this, while each E & O is written in the first person, it is notable that they have not been co-developed with young people and are therefore not necessarily statements that a young person might actually say. Like any feature of the curriculum, they are shaped and influenced by the ideologies of those that created them. As a result, it is possible that the Es & Os portray a particular version of what health

and wellbeing can/ is ought to look like for young people at this age and stage based on these ideologies.

8.11 Final Reflection

The *Vitae Research Development Framework* is a tool that outlines the knowledge, skills, and behaviours of effective researchers at various points in their careers (Vitae, 2025). My Doctorate of Education experience has been both a personal and professional development opportunity, and my understanding of what it means to be a research-engaged professional has evolved at each stage of this process. In this final section of my thesis, I use the *Vitae Research Development Framework* to evaluate how my personal and professional values as a researcher have developed and how my research knowledge and skills have strengthened. In doing so, I intend to establish a fixed point from which my future development as an early-career researcher can be measured.

This thesis has shown a level of research knowledge and skill that aligns with Phase 3 of the Framework. Due to the multidisciplinary and cross-sectoral characteristics of this study, I accepted an opportunity to be innovative in my approach towards answering my research questions. In this regard, my methodology reflects many descriptors including the use of creative methods in gathering primary data, the use of specialist sources of spatial data, and the use of current digital techniques relevant to the field. As such, I have shown a

diverse skillset as a researcher and developed the ability to manage and execute complex research designs.

The sequential design of this study allowed for meaningful integration of these techniques. I have been consistently mindful of the strengths and limitations of these approaches, and their application has been rigorous and well justified as a result. This justification is derived from my subject knowledge. I have learned the value of knowing how previous research has been conducted in the field. Because my research intends to have an impact across different sectors, my knowledge of what has come before has been an asset when working towards this goal. It has also given me the confidence to question established approaches associated with any one field and, because of this, I see my study as contributing to developing new methods within this area of study.

My personal and professional values and behaviours as a researcher reflect Phase 3 of the Framework in several ways. Completing an EdD part-time is an example of the sustained effort and perseverance associated with this level. Throughout this process, I have balanced multiple priorities in my personal and professional life and responded to unforeseen challenges. This has led to the development of a reflexive approach to working, and I have learned to be very efficient with my time, especially during the complex data analysis phase. The complexity of this study has also required a high level of ethical reflection and accountability, and these are values that I have since applied elsewhere in other projects and professional roles.

My decision to pursue an EdD and explore my chosen topic was informed by my personal and professional experiences working with young people as a classroom teacher. I believe, however, that this thesis is a good example of my ability to align my work with broader priority areas. In this sense, although there is a personal and professional outcome associated with completing an EdD, I also understand the strategic context of my work and how it can be used to address issues recorded across sectors at a local, regional, and national level. As a result, the outcomes of this thesis evidence the potential for my study area to be an emerging field with relevance to several sectors. Going forward, I am keen to build upon this work.

In the immediate future, I look forward to opportunities to fulfil other descriptors of Level 3 of the *Vitae Research Development Framework*, such as disseminating my findings, incorporating this work into my teaching, and leading research teams. I also hope to join or build a research community interested in using creative mixed methods approaches to better understand adolescent experiences with open spaces. I have experienced a lot of personal and professional growth, but I eagerly await these new opportunities as I embark on a new phase as an early-career researcher.

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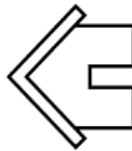
Appendices

Appendix A1: Mobility map activity

Task 1: The Mobility Map

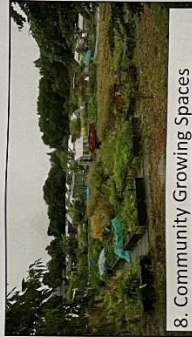
For this task, you are going to create a mind map. Think about the types of public open spaces you visit.

- Choose a place from the sheet, add its number to the sheet.
- From the house in the centre, draw a line that connects the house to the number
- Now, draw lines coming from the number and write down:
 - How long it takes to get to this place from your house (in minutes)
 - How you get there (walking, car, bike, bus etc.)
 - How long you normally spend there
 - What you do there
 - How often do you go here?





7. Natural/Semi Natural Green Spaces



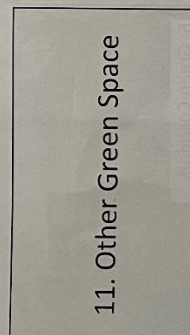
8. Community Growing Spaces



9. Civic Space



10. Burial Grounds



11. Other Green Space



1. Public Parks and Gardens



2. Private Gardens or Grounds



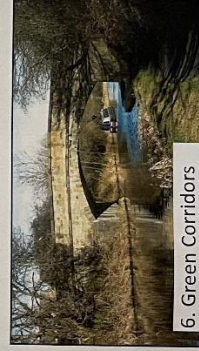
3. Amenity Green Space



4. Play space for Children and Teenagers



5. Sports Areas



6. Green Corridors

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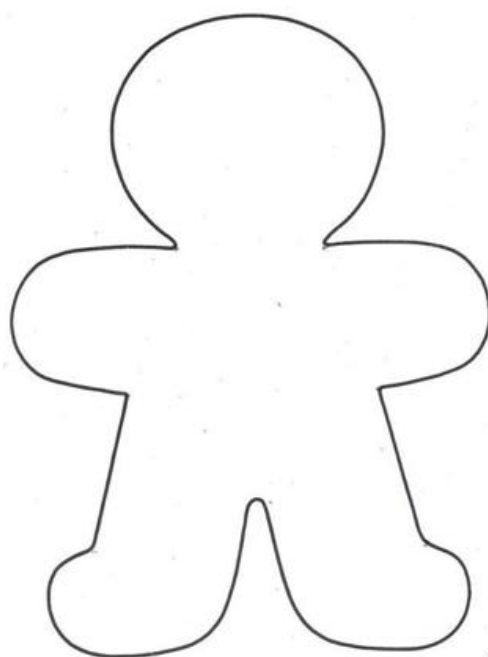
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Appendix A2: Body map activity

This task is about the features of public open spaces and how they make you feel. Features are the parts of things that make them stand out or interesting.

Think about the public open spaces you wrote about in Task 1. Write down or draw the features of those places outside the gingerbread person shape e.g. trees, goal posts, good for playing, benches, etc.

Then, write down or draw how those features make you feel inside the shape.



— 21

Appendix B: Participant information sheets and consent forms



Participant Information Sheet for Parents/Carers

Name of department: School of Education

Title of the study: Exploring the distribution of local authority managed public open space in urban areas and its influence on the wellbeing of adolescents aged 12-15

Introduction

My name is William Quirke and I am a Teaching Fellow and EdD student at the University of Strathclyde. Prior to joining the University of Strathclyde, I used to work as a Geography teacher in a High School in the central belt. My supervisors for this research project are Dr Markus Klein and Dr Edward Sosu. Our contact details can be found at the end of this information sheet.

What is the purpose of this research?

The main objective of this study is to identify the types of public open space commonly utilised by adolescents living in urban areas and identify the extent to which adolescents recognise public open space as a factor that influences their wellbeing. In addition to this, this study seeks to identify whether there is equitable distribution of the public open spaces used by young people across urban local authorities and test whether there is a relationship between this spatial distribution and spatial measures of relative deprivation.

Through this investigation, the following research questions will be explored:

1. What are the functions and characteristics associated with the types of public open space visited by adolescents aged 12-15?
2. To what extent do adolescents aged 12-15 perceive public open space as a factor that influences their social well-being?
3. What is the spatial distribution of the types of public open spaces used by adolescents within the boundaries of Scottish councils?
4. Is the spatial distribution of public open space used by adolescents within the boundaries of Scottish councils associated with area-based measures of relative deprivation?

Does your child have to take part?

Taking part in this research is voluntary. If you would not like your child to take part in this research, then you can communicate this by returning the consent form attached to this sheet. If you decide that you would like your child to participate but change your mind at a later date and wish to withdraw your child's participation, then you have the right to do so. You can withdraw from the project at any time. You or your child will not be treated any differently if you choose not to take part at this stage or wish to withdraw from the project at a later date.

What will your child do in the project?

Your child will participate in a workshop lead by William Quirke. In this workshop, your child will complete three activities.

First, they will complete a Mobility Map where they will be asked to record the types of public open space they visit, how they get there, how far they travel to get there, the activities they do there, how long they spend there and how frequently they visit.

Then, they will complete a Body Map where they will be asked to record the characteristics they associate with the public open spaces they visit and how those characteristics make them feel.

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Finally, they will read through the Experiences and Outcomes used in the Scottish Curriculum for Excellence and highlight the ones they associate with public open spaces.

This should take no more than the length of a lesson period. Examples of the worksheets your child will be using have been included in this form.

Why has your child been invited to take part?

Your child has been invited to take part because they are in S1-S3 and attend school in an urban area.

What are the potential risks to you in taking part?

There are no risks to your child when participating in this study.

What information is being collected in the project?

This study will collect information on what types of public open space your child visits, how they get there, what they do there, how long they stay there and how often they visit these places. Their name, address or the names or addresses of the places they visit will not be collected.

Information will also be collected on the things they see in the public open spaces and how these make them feel. Likewise, names and addresses of the child or the place they visit will not be collected.

Who will have access to the information?

The only people that will have access to the information gathered are me, William Quirke and my two supervisors, Dr Markus Klein and Dr Edward Sosu.

Where will the information be stored and how long will it be kept for?

Physical copies of worksheets completed by your child during the workshops will be scanned and stored electronically in a University of Strathclyde OneDrive folder. This will only be accessible by the researchers. The only identifier that will be maintained is the local authority that the materials have originated from. Physical copies will be stored in securely in the University of Strathclyde and destroyed once the study has been completed.

All data gathered as part of this study and will be stored digitally for 5 years after the study has ended.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

What happens next?

If you would like to find out more about the project, then please get in touch with me, William Quirke, or one of my supervisors.

If you would **not** like for your child to participate in this research, then please return the consent form attached to <teacher name here>. I thank you for your attention.

Once information gathering is complete, a summary of the study will be shared with your school. This can then be shared with you. You will also be provided with a digital copy of the completed thesis upon request.

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Researcher contact details:

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Dr Edward Sosu
Investigator
Institute of Education,
Level 2, Lord Hope Building,
University of Strathclyde
Edward.sosu@strath.ac.uk

This research was granted ethical approval by the University of Strathclyde Institute of Education Ethics Committee.

If you have any questions/concerns, during or after the research, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Secretary to the University Ethics Committee
Research & Knowledge Exchange Services
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50 George Street
Glasgow
G1 1QE

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Email: ethics@strath.ac.uk

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Consent Form for Parents/Carers

Name of department: School of Education

Title of the study: Exploring the distribution of local authority managed public open space in urban areas and its influence on the wellbeing of adolescents aged 12-15

- I confirm that I have read and understood the Participant Information Sheet for the above project and the researcher has answered any queries to my satisfaction.
- I do not consent to my child being a participant in the project.

(PRINT NAME)	
Signature of Participant:	Date:

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Participant Information Sheet for Participants

Name of department: School of Education

Title of the study: Exploring the distribution of local authority managed public open space in urban areas and its influence on the wellbeing of adolescents aged 12-15

Introduction

My name is William Quirke. I work as a Teaching Fellow and I am also an EdD student at the University of Strathclyde. Before I started working in the University of Strathclyde, I used to work as a Geography teacher in a High School in the central belt. My supervisors for this research project are Dr Markus Klein and Dr Edward Sosu. Our contact details can be found at the end of this information sheet.

What is the purpose of this research?

I am interested in finding out what types of public open space (such as parks and playing fields) young people your age use and if you think public open space has an effect on your wellbeing. I also want to find out if public open space is spread equally across different councils.

My research aims to answer the following questions:

1. What are the functions and characteristics associated with the types of public open space visited by adolescents aged 12-15?
2. To what extent do adolescents aged 12-15 perceive public open space as a factor that influences their social well-being?
3. What is the spatial distribution of the types of public open spaces used by adolescents within the boundaries of Scottish councils?
4. Is the spatial distribution of public open space used by adolescents within the boundaries of Scottish councils associated with area-based measures of relative deprivation?

Do you have to take part?

Taking part in this research is voluntary. If you would not like to take part in this research, then you can let me know this by returning the consent form attached to this sheet. If you decide that you would like to take part but change your mind at a later date and wish to stop taking part, then you have the right to do so. You can stop taking part in the project at any time. You will not be treated any differently if you choose not to take part at this stage or wish to stop taking part in the research project at a later date.

What will you do in the project?

You will participate in a workshop lead by me, William Quirke. In this workshop, you will complete three tasks.

First, you will complete a Mobility Map where you will be asked to record the types of public open space you visit, how you get there, how far you travel to get there, the activities you do there, how long you spend there and how frequently you visit.

Then, you will complete a Body Map where you will be asked to record the characteristics you associate with the public open spaces you visit and how these characteristics make you feel.

Finally, you will read through a list of Experiences and Outcomes used in the Scottish Curriculum for Excellence and highlight the ones you associate with public open spaces.

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This should take no more than the length of a lesson period. Examples of the worksheets you will be using have been included in this form.

Why have you been invited to take part?

You have been invited to take part because you are in S1, S2 or S3 and attend school in an urban area.

What are the potential risks to you in taking part?

There are no risks to you when participating in this study.

What information is being collected in the project?

This research will collect information on what types of public open space you visit, how you get there, what you do there, how long you stay there and how often you visit these places. Your name, address or the names or addresses of the places you visit will not be collected.

Information will also be collected on the things you see in public open spaces and how these make you feel. Likewise, your name and addresses or of the place you visit will not be collected.

Who will have access to the information?

The only people that will have access to the information gathered are me, William Quirke and my two supervisors, Dr Markus Klein and Dr Edward Sosu.

Where will the information be stored and how long will it be kept for?

Paper copies of worksheets you complete during the workshops will be scanned and stored electronically in a University of Strathclyde OneDrive folder. This will only be able to be opened and viewed by me and my supervisors. The only piece of named information that will be recorded is the council that our work has been gathered from. Paper copies will be stored in a locked drawer in the University of Strathclyde and destroyed once the study has been completed.

All data/information gathered as part of this research will be stored digitally for 5 years after the research has ended.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

What happens next?

If you would like to find out more about the project, then please ask your parent/guardian/carer to get in touch with me, William Quirke, or one of my supervisors.

If you would **not** like to participate in this research, then please return the consent form attached to <teacher name here>. I thank you for reading this information.

Once information gathering is complete, a summary of the study will be shared with your school. This can then be shared with you. You will also be provided with a digital copy of the completed thesis upon request.

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This research was granted ethical approval by the University of Strathclyde Institute of Education Ethics Committee.

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Research & Knowledge Exchange Services
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Telephone: 0141 548 3707
Email: ethics@strath.ac.uk

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Consent Form for Participants

Name of department: School of Education

Title of the study: Exploring the distribution of local authority managed public open space in urban areas and its influence on the wellbeing of adolescents aged 12-15

- I confirm that I have read and understood the Participant Information Sheet for the above project and the researcher has answered any questions to my satisfaction.
- I do **not** consent to being a participant in the project.

(PRINT NAME)

Signature of Participant:

Date:

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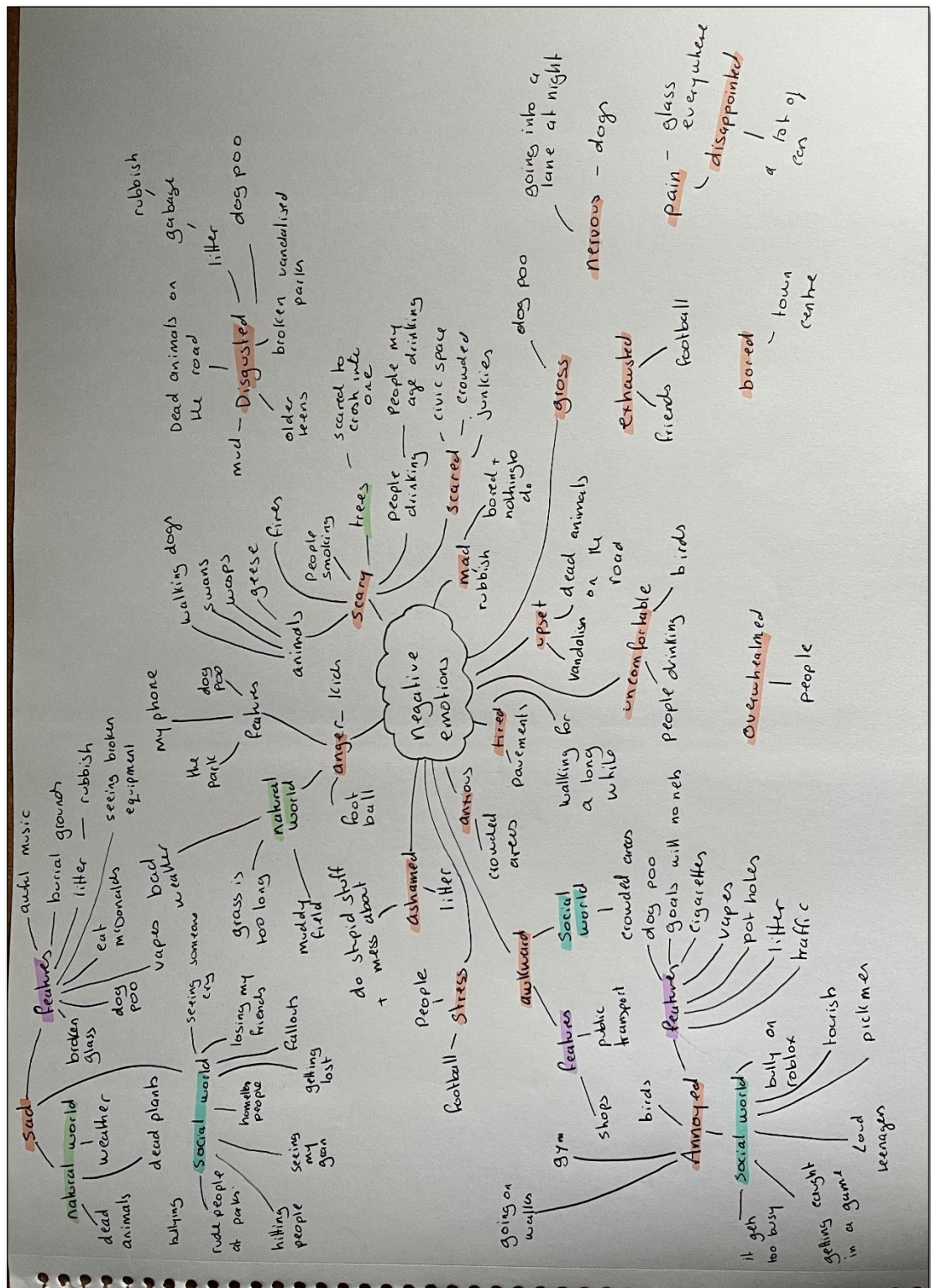
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Appendix C: Example of SPSS Coding

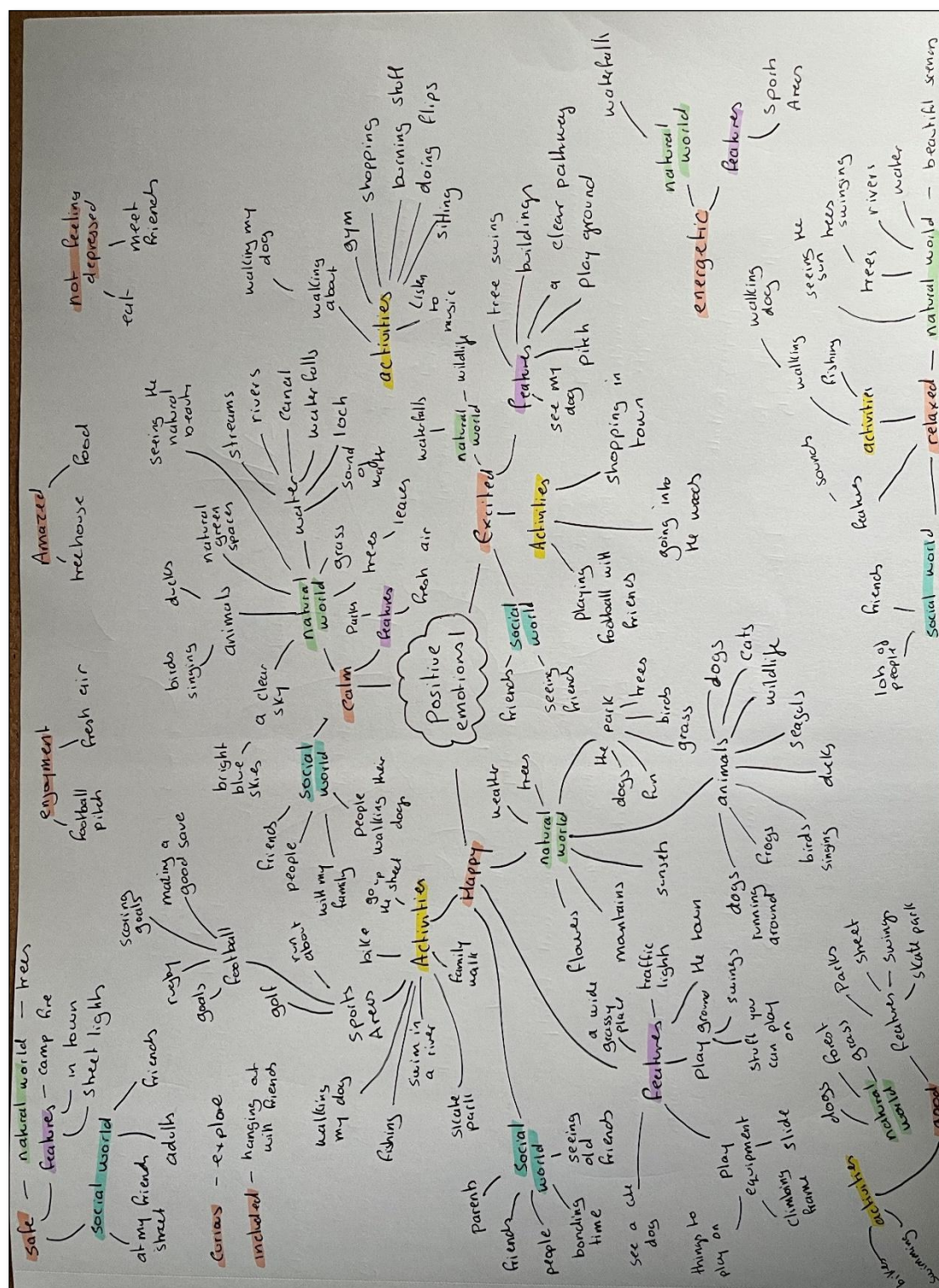
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Search application											
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2	Local_Auth_...	Numeric	8	0		{1, Highland}...	None	8	Right	Nominal	Input
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5	POS_1	Numeric	8	0		{0, No}...	None	8	Right	Nominal	Input
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7	Mode_of_tr...	Numeric	8	0		{1, Walk}...	None	8	Right	Nominal	Input
8	Time_spent...	Numeric	8	0		None	None	8	Right	Scale	Input
9	Frequency_1	Numeric	8	0		{1, few times a week}...	None	8	Right	Nominal	Input
10	Activities_1	Numeric	8	0		{1, Physical Activity}...	None	8	Right	Nominal	Input
11	POS_2	Numeric	8	0		{0, No}...	None	8	Right	Nominal	Input
12	Time_it_tak...	Numeric	8	0		None	None	8	Right	Scale	Input
13	Mode_of_tr...	Numeric	8	0		{1, Walk}...	None	8	Right	Nominal	Input
14	Time_spent...	Numeric	8	0		None	None	8	Right	Scale	Input
15	Frequency_2	Numeric	8	0		{1, few times a week}...	None	8	Right	Nominal	Input
16	Activities_2	Numeric	8	0		{1, Physical Activity}...	None	8	Right	Nominal	Input
17	POS_3	Numeric	8	0		{0, No}...	None	8	Right	Nominal	Input
18	Time_it_tak...	Numeric	8	0		None	None	8	Right	Ordinal	Input
19	Mode_of_tr...	Numeric	8	0		{1, Walk}...	None	8	Right	Nominal	Input
20	Time_spent...	Numeric	8	0		None	None	8	Right	Scale	Input
21	Frequency_3	Numeric	8	0		{1, few times a week}...	None	8	Right	Nominal	Input
22	Activities_3	Numeric	8	0		{1, Physical Activity}...	None	8	Right	Nominal	Input
23	POS_4	Numeric	8	0		{0, No}...	None	8	Right	Nominal	Input
24	Time_it_tak...	Numeric	8	0		None	None	8	Right	Scale	Input

Overview
Data View
Variable View

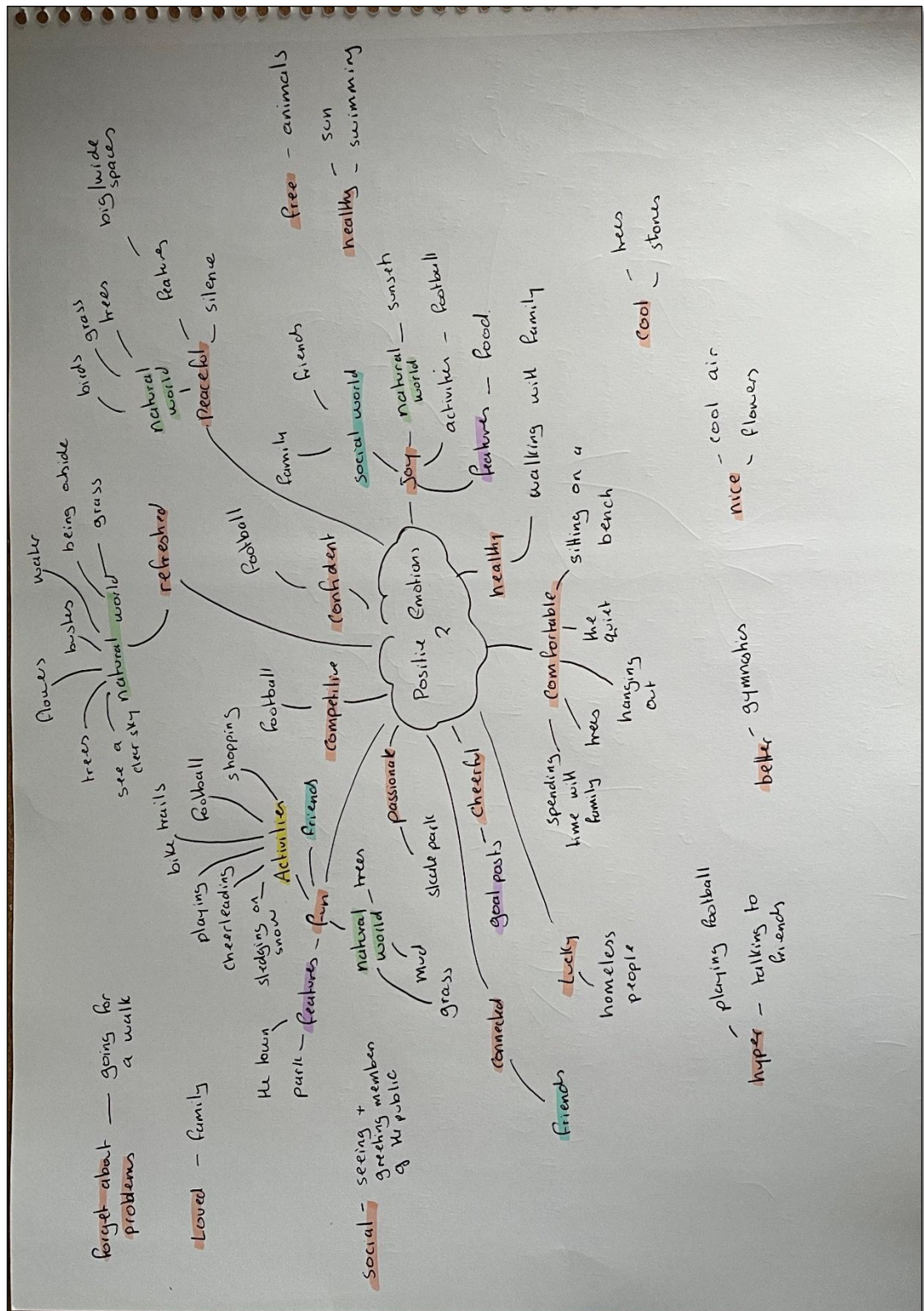
Mind map of initial themes relating to negative emotions.



Mind map of initial themes relating to positive emotions 1.

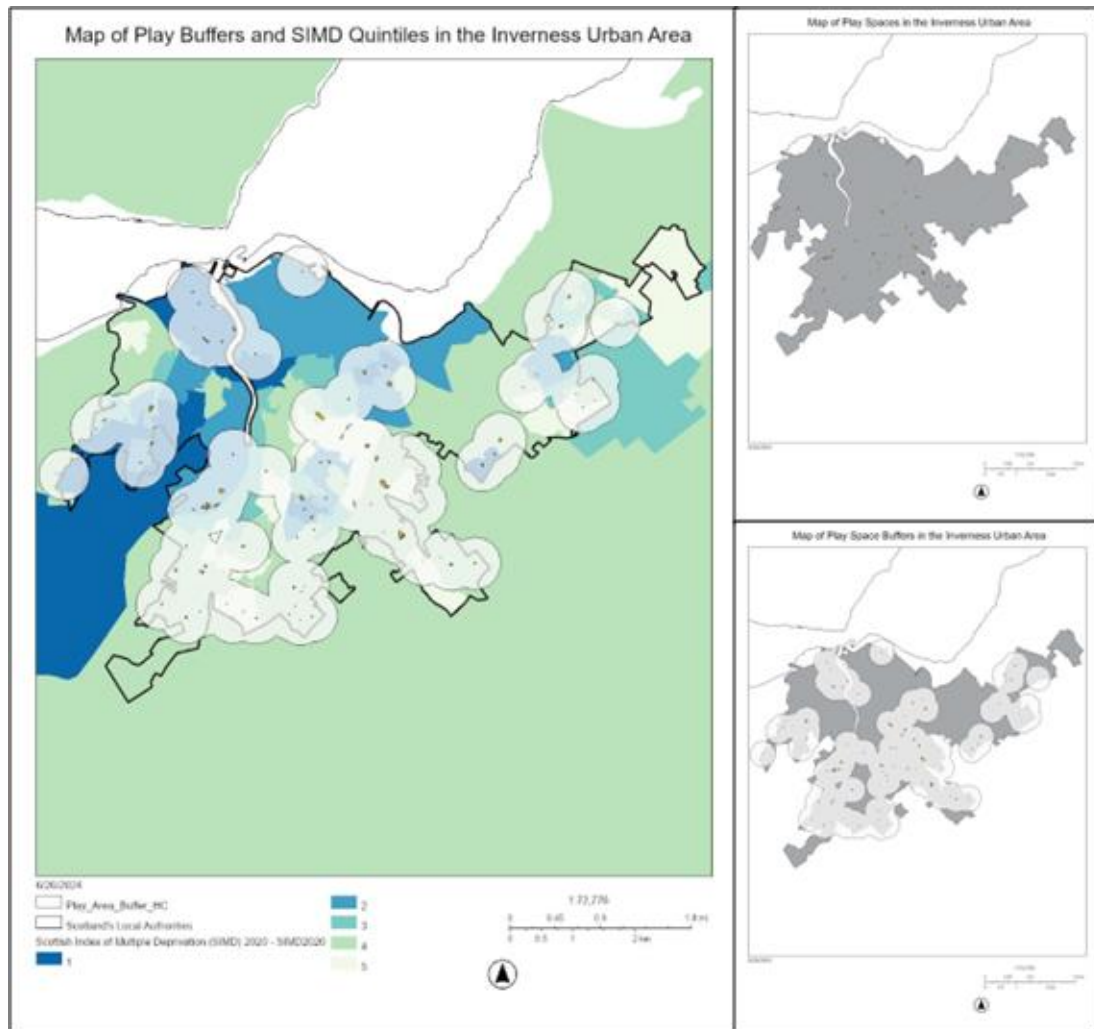


Mind map of initial themes relating to positive emotions 2



Appendix E: Example of geospatial analysis output

Play Space findings in the Inverness urban unit.



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