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Shared residential outdoor space:
what residents do there and the features
that support high levels of usage

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A thesis submitted in partial fulfilment of the requirements for
the degree of Doctor of Philosophy in Engineering

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- | | |
|-----------------------------|-----------------------|
| Hanging washing out | Sitting & relaxing |
| Entertaining visitors | Talking to neighbours |
| Keeping pets | Maintaining a car |
| Gardening | Exercising |
| Growing food | Children’s play space |
| Eating outside | Access route |
| Feeding & enjoying wildlife | Other |

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Amanda Griffin, 3rd September 2012

Dedication

to Pamela
my constant inspiration

Declaration

The researcher was research assistant to the WISE group's part of the I'DGO TOO project (www.idgo.ac.uk). Data was gathered in conjunction with this project. The researcher was involved in all the decisions relating to the methods to be used for gathering the data. Initial locations of older people's housing were selected by Dr. Nicola Dempsey (post-doctoral researcher) and Dr Lynne Mitchell (co-investigator). Amanda Griffin and Dr Dempsey shared the work of investigating developments for possible inclusion in the sample, selecting the rest of the sample, designing the questionnaire and managing the mailing of the questionnaire. Data entry was managed by Dr. Chris Stride of the University of Sheffield. Dr. Lynne Mitchell provided the data on social economic status.

Everything else reported in this thesis is the work of Amanda Griffin. She did all the desk top study and analysis reported here, planned and conducted the interviews and the conclusions are hers alone.

No part of the work contained in this thesis has previously been published by the author. This thesis has not been submitted for a degree at any other university.

Abstract

Shared residential outdoor space (ROS) is an important resource, especially in urban areas where outdoor space is limited. This study investigates how well shared ROS is used by residents. Data was collected from 129 developments and streets using a postal questionnaire. 346 different areas within the selected sites were measured using the Carto tool of EDINA's Digimap. Different types of layout were identified; the area of residential outdoor space available per dwelling was calculated and the distance along a walking route to the nearest shop and public open spaces was measured for each area. Aerial and birds-eye view satellite photographs from www.bing.com were used to assess greenness and tree cover and to confirm the layout and era of the buildings.

1328 valid questionnaires were returned. These are considered in three sets: shared ROS only; individual ROS only and both shared and individual ROS. Respondents with only shared ROS available report significantly lower levels of usage than respondents in the other two sets. Variables that vary across the sets and with levels of usage are identified. These are investigated using a case-based, rather than a variable-based method, using fsQCA software developed by Ragin (2008). This enables sets of variables linked with high and low usage of shared ROS to be identified. The most influential attributes are: area of ROS per dwelling, number of households sharing the ROS, greenness, maximum floor level of the dwelling and concerns about noise and privacy. Six interviews and consideration of nine specific developments show that uncertainty about what is 'allowed' and concerns about not upsetting neighbours are also inhibitors to using shared ROS. Recommendations are made for improving how well shared residential outdoor spaces are used.

Abbreviations

- IROS - individual residential outdoor space
- ISROS - both individual and shared residential outdoor space
- ROS - residential outdoor space
- SROS - shared residential outdoor space

CHAPTER 1 INTRODUCTION

1.1 Aim and scope of the research

This research is based on the premise that in situations where outdoor space is limited, such as in inner cities, it should be designed and managed in a way that enables city residents to use and enjoy it and gain maximum benefit from it. It is argued that having access to outdoor space brings people physical, psychological, social and emotional benefits and that residential outdoor space is particularly important, especially in highly built up areas. The focus of this research is on how people use the private, outdoor space attached to their dwelling, which is referred to throughout, as residential outdoor space or ROS. This is the space that residents have access to, but other people only enter by invitation (or implied invitation *e.g.* for delivery of post). The primary aim of this study is to discover if there is a difference in how residents use their private, residential outdoor space in situations where several households share the same outdoor space (*shared* residential outdoor space or SROS) and those where residents have access to their own *individual*, private, residential outdoor space (IROS). Further aims are to discover what factors support or discourage use of shared residential outdoor space and what design attributes are most supportive of use of such spaces by residents. This chapter introduces the research questions and explains the structure of the thesis.

1.2 Background

Much of the data for this study was gathered in conjunction with a research project, which is part of the I'DGO TOO programme, funded by the EPSRC

(Engineering and Physical Sciences Research Council). This programme is concerned with the well being of older people in the built environment. Information about the first part of the programme, I'DGO, and I'DGO TOO can be found on the website, www.idgo.ac.uk. The researcher was research assistant on the project of the WISE (Wellbeing in Sustainable Environments) team at the University of Warwick. This team, headed by Professor Elizabeth Burton, was investigating the impact of access to private, residential outdoor space on the wellbeing of older people.

1.3 Research questions

To achieve the aims of the study the key research questions have been identified (as described in Chapter 2) as:

- What are the differences between the ways that residents with individual and those with shared, private residential outdoor space use their space and how do these compare with those who have access to both?
- Do residents of housing developments in which only shared, private residential outdoor space is provided, use that space in the way that they would like?
- What factors influence the way in which residents use their shared, private residential outdoor space?
- Are there benefits for those with shared residential outdoor space in having access to some individual private residential outdoor space as well?
- How can shared residential outdoor spaces be designed to enable all residents to gain maximum benefit from them?

1.4 Structure of this thesis

The development of these research questions is discussed in Chapter 2 by reference to previous research and the gaps in it.

In Chapter 3 the variables to be measured are derived and the reasons for selecting the chosen research approach and methodology are discussed.

The methods for the collection and analysis of data are detailed in Chapter 4.

The findings from the research are described in chapters 5 to 7. In Chapter 5 a comparison is made between the use made of their residential outdoor space by residents who have access to shared residential outdoor space only, and the use made by those who have access to some individual residential outdoor space. The relationship of residents, in these two situations, with their residential outdoor space is also explored and compared. Chapter 6 explores a wide range of variables, which may influence how much residents use their space and explain any differences in usage. These fall into four groups: attributes of the dwelling; attributes of the development, including the residential outdoor space, attributes of the respondent and their household; and attributes of the immediate locality. Attributes that are associated with variations in usage of residential outdoor space are identified and the extent to which these may explain variations in usage is discussed. In Chapter 7, nine developments, with varying levels of usage of residential outdoor space, are described and differences in their attributes and comments from their residents are explored. This informs a discussion of the factors that may influence how much shared

residential outdoor space is used by residents and how design of these spaces may support greater levels of use.

Chapter 8 considers all the findings and identifies key attributes that increase the likelihood of shared residential outdoor space being used effectively.

Suggestions are made about how to design such spaces so that residents can gain maximum benefit from them. The contribution of this research and its' methodology to current knowledge is underlined, its limitations are discussed and suggestions for further research are made.

CHAPTER 2 THE IMPORTANCE OF RESIDENTIAL OUTDOOR SPACE

Our research and the research of others have made one fact all too clear: Environments are designed and modified every day in ways that fail to support people's needs and requirements. (Kaplan, 1998, p.7)

2.1 Introduction

This chapter explores why urban outdoor space is so important and the particular case of private, residential outdoor space. Research on the design and use of public parks and what is known about how people use their private residential outdoor space (ROS) is considered and the research questions defined.

Outdoor space, particularly green outdoor space, is important in cities because of the benefits it confers on the inhabitants. These are of two closely linked kinds: health benefits (passive, physical, psychological and emotional) and social benefits.

2.2 Benefits of outdoor space to city dwellers

2.2.1 How urban outdoor space affects people's health and comfort – passive benefits

Urban outdoor spaces influence the health and comfort of city residents, even if they never enter them. This is because they change the quality of the environment that residents are living in. Research on the environmental impact of open spaces mainly focuses on the effect of vegetation, especially trees. The following sections consider the impact of outdoor spaces and vegetation on air quality (Section 2.2.1.1), climate (Section 2.2.1.2) and drainage (Section 2.2.1.3).

2.2.1.1 Air Quality

High levels of air pollutants in cities, particularly from vehicle exhausts, are a major source of discomfort and ill health (Kampa and Castanas, 2008; Curtis *et al.*, 2006). The links between air pollution and the exacerbation of respiratory problems, such as asthma (Neidell, 2004; Peden, 1996; Shuk-Mei Ho, 2010) and chronic obstructive pulmonary disease (COPD) (Silkoff *et al.*, 2005; Salvi and Barnes, 2009) are well established. Pollutants also exacerbate frequent ear infections in children (Bhattacharyya and Shapiro, 2010) and cause increases in mortality from cardiovascular and respiratory conditions (Wei Huang *et al.*, 2009). For example, mortality from cardiopulmonary disease is higher in people who live near major roads than in those who live away from such roads (Hoek, 2002).

Where streets are narrow and buildings high, movement of air may be restricted. This can cause pollutants, from car exhausts and other sources, to congregate. Outdoor spaces allow the air to move and pollutants to disperse. Plants increase the beneficial effect of an outdoor space on air quality (Bernatsky, 1978; Bradshaw *et al.*, 1995; Dept of Environment, 1996, Leung *et al.*, 2011). As air moves past the many leaves on a tree or bush, it tends to deposit any dust that it is carrying, much as a river deposits mud where it is forced to flow more slowly. Leaves also remove polluting gases such as carbon monoxide (CO), sulphur dioxide (SO₂) and the various nitrous oxides (No_x) (Bernatsky, 1978; Bradshaw *et al.*, 1995; Dept of Environment, 1996). By removing particulate and gaseous pollutants, plants create measurable improvements in air quality, especially near to roads, where pollution levels are high. These improvements in air quality result in improved health of nearby residents.

2.2.1.2 Climate

Cities usually have a higher surface and air temperature than the surrounding countryside. This is called the urban heat island effect and is strongest in the centre of the built up area (National Meteorological Library and Archive, 2011). The temperature difference can be between 1°C and 3°C depending on weather conditions, the time of day and the structure of the city. The main cause of this effect is that building materials such as concrete, brick and stone absorb and store solar energy during the day and release it slowly at night as heat, whereas vegetation absorbs and uses solar energy (Met Office, 2009). This effect is advantageous to city residents in cool conditions, as it reduces the amount of energy required for heating, but disadvantageous when temperatures are high.

Outdoor spaces allow air to move and remove some of the heat radiated from buildings. If the outdoor space is vegetated, the plants transpire. This process pulls cool water (H₂O) from the soil and releases it into the air as vapour. The process of evaporation uses heat from the air, which is thus cooled and humidified (Grey and Deneke, 1978; Georgi and Dimitriou, 2010). This means green outdoor spaces are cooler than adjacent built up areas, which can be clearly seen on Landsat (2011) thermal images. Thermal imaging also shows that non-green outdoor spaces, such as tarmacadamed car parks, tend to be hotter than surrounding buildings.

Warm air is drawn towards a cooler green outdoor space, creating horizontal air flow. This improves thermal comfort and in cities where most domestic energy use is for cooling rather than heating, gives significant energy savings (and hence economic benefits) in buildings around the green outdoor space.

Lin Wenqi *et al.* (2011), calculate that green areas in Beijing reduce the city's carbon dioxide emissions by more than 14,000 tons per year and show that edge effects mean that a large number of small green areas with uneven edges have a greater effect than one large smooth-edged area.

Large shrubs and trees also improve thermal comfort in hot conditions by providing shade. They may reduce the amount of solar radiation received by an adjacent wall by up to 85% and thereby reduce the internal temperature of the building (McPherson, 1993; Akbari *et al.*, 1997).

In Great Britain's temperate climate the cooling effects of outdoor spaces are enjoyed for only a few weeks of the year. Our climate, however, is warming. Mean annual Central England temperature has risen by 1°C over the past 40 years and is predicted to rise as much in the next 40 years. Mean summer temperatures are expected to rise by 3.5-4°C during this century. It is estimated that by 2012 there is a 1 in 40 risk (1 in 4 during the decade) of a 9-day heatwave at 27°C in South-East England. This could cause 3,000 immediate deaths and more than 6,000 heat-related deaths in the following few months (DH/HPA, 2008). Thus even in Britain, mitigation of hot conditions by the provision of vegetated outdoor spaces and trees, results in improved thermal comfort and may save lives during extended periods of high temperature, especially as it is not common for residential properties in Britain to be air-conditioned.

Trees and large shrubs can also reduce the use of energy for heating if carefully located. They provide shelter from the wind if properly sited and, if planted adjacent to buildings, provide a "dead space" where the lack of air

movement acts as insulation (Bernatsky, 1978; BRE, 1990; Beazley, 1991; Brown & Gillespie, 1995). Robinette (1972, cited by Bradshaw, 1995) estimates that well sited dense shrubs can give heating fuel savings of up to 23%, while Akbari *et al* (1992, 1997) estimate that savings of 10% of heating energy could be made in Canadian cities by careful planting of trees. As rising costs of heating fuel are a major cause of worry for many older people on fixed incomes, such small effects could improve thermal comfort and reduce levels of mortality and of anxiety in this group.

These studies demonstrate how planting in outdoor spaces close to dwellings can moderate the micro-climate that their residents experience and how small areas of green space can increase air flow and mitigate the impact of high temperatures in built up areas. They also show the importance of trees in cities for the provision of shade and cooling effects. These benefits may become even more important as global temperatures rise.

2.2.1.3 Drainage

An urban environment, by definition, is one where permeable surfaces such as soil and vegetation are replaced by impermeable surfaces such as concrete, stone and tarmac. This means that instead of wetting numerous leaves and slowly infiltrating the soil, rainwater runs rapidly off the hard surfaces into nearby watercourses. This flow of water washes dirt, oil and heavy metals from car exhausts and other toxic pollutants off the surfaces into the watercourse. Most run-off is not treated before entering our rivers and streams and is a major source of pollution and ecological damage in UK rivers. Rapid run-off also increases the risk of flooding caused by heavy rainstorms (Environment Agency, 2003; Whitford *et al.*, 2001).

Pollutants are also washed into groundwater, which is the source of much of our drinking water and is very difficult to treat (CIRIA, 2000). Sustainable water management solutions have been developed to minimise urban run-off. A key component is to increase the area of permeable surface on a site (CIRIA, 2000). One way to do this is to increase the proportion of vegetated land surface. Whitford *et al.* (2001) developed a model to predict the sustainability of different types of urban residential area. They predict strong correlations between the area of green space (and tree cover) and reduced summer air temperatures, reduced run-off and increased biodiversity.

2.2.1.4 Summary of passive health benefits of outdoor spaces

Some urban dwellers are not interested in or attracted to outdoor spaces or to natural environments (Kellert, 1984). It is clear from the research though, that whatever the views of city dwellers about outdoor spaces, green outdoor spaces and particularly trees improve the environment that they live in and hence their health. The impacts of trees and other vegetation on air quality and drainage are particularly valuable. Trees and shrubs are also useful in muffling noise and re-odourising the air (benefits that have not been discussed in detail here) (Bradshaw *et al.* 1995). Even small areas of green space and street trees can have a local effect on the climate and provide habitat and corridors for wildlife. As Whitford concludes

“The results of this study, therefore, show clearly that the ecological performance of cities depends crucially on the amount of vegetation cover, especially of trees, in the urban environment.”

(Whitford, 2001, p. 101)

2.2.2 How urban outdoor space affects people's health – physical benefits

The belief that physical activity is a requirement for health and longevity is an ancient one.

all parts of the body which have a function, if used in moderation and exercised in labours in which each is accustomed, become thereby healthy, well-developed and age more slowly, but if unused and left idle they become liable to disease, defective in growth and age quickly. (Hippocrates c.460-370 BC; trans. by Jones, 1967; quoted by Hardman and Stensel, 2009)

In many societies it has only been a wealthy minority and the infirm that have been likely to avoid physical activity. In the modern world, however, increasing numbers of people no longer have physically active work. Concern about the impact of this on our health and mortality has spawned a considerable volume of research. This section reviews some of the evidence that *regular* physical activity is linked to improved health outcomes. This is followed by a discussion of research that investigates if people are more likely to be physically active if they live near an outdoor space and finally, studies that link health outcomes directly to nearby green space are considered.

2.2.2.1 Physical activity, health outcomes and mortality

Mid 20th century research on the impact of physical activity on health, focused on comparisons between populations with different levels of activity in their jobs. For example, London bus conductors, who climbed about 600 stairs in their working day, suffered from half as many heart attacks (coronary heart disease, CHD) as their more sedentary driver colleagues (Morris *et al.*, 1953).

This was regardless of how portly they were (as measured by the size of their uniform trousers). Similar differences were found between postmen who delivered and those who sorted mail (*ibid.*). As most people's work life has become more sedentary, later research looks at physical activity during leisure time. Few such studies include energy expended in working time.

Large-scale longitudinal studies have demonstrated links between physical activity and reductions in mortality and the risk of some diseases. They tend to concentrate on the impact on cardiovascular disease (heart and vascular conditions including coronary heart disease (CHD) and stroke). CHD is the biggest cause of death and morbidity in the UK, Europe (Scarborough *et al.*, 2010) and the USA (Roger *et al.*, 2011). Most research concentrates on the groups most likely to suffer from cardiovascular disease, middle aged men in sedentary jobs, older men and post-menopausal women.

The Harvard Alumni Health Study of male alumni found that death-rates were 25-33% lower among those who expended more than 8,400 kJ (2,000 kcal) per week compared to those who expended less (Paffenbarger *et al.*, 1986; Lee *et al.*, 1995). This is equivalent to 6 hours and fifteen minutes of brisk walking, about 40km (25 miles) (Hardman and Stensel, 2009). This reduction in mortality is still significant after controlling for smoking, high blood pressure, extremely high or low body mass and early parental death. This study also shows that the risk of heart attack is inversely related to energy expenditure and that this was independent of other risk factors such as smoking, hypertension and high Body Mass Index (BMI). Alumni who had participated in sport at university only had a reduced risk of coronary heart disease (CHD) if they maintained their level of physical activity, while those who became

more active later in life, reduced their risk (Paffenbarger *et al.*, 1993). This suggests that as far as reducing risk of CHD is concerned, regular exercise must be continued to be effective.

Other studies suggest that only 'vigorous' exercise is linked to a substantial reduction in risk of CHD. A study of nearly 18,000 male civil servants with sedentary roles found that increased energy expenditure has a small inverse relationship with risk of CHD, while regular 'vigorous' exercise halves the risk (Morris *et al.* 1953). This effect is stronger in the older age group (55 to 65 yrs) and independent of smoking, height and weight to height ratio. Morris (*ibid* & 1980) suggests that vigorous exercise "trains" the heart muscles in a way that more moderate exercise does not. Research also shows reductions in mortality amongst physically able, non-smoking, retired men who walk more than 2 miles per day (Hakim *et al.*, 1998) and middle-aged men who have improved their measured physical fitness (Erikssen *et al.*, 1998). Regular vigorous physical activity is also associated with reduced risk of non-insulin-dependent diabetes mellitus (Helmrich *et al.*, 1991), hypertension (Paffenbarger *et al.* 1983) and later onset of disability in older people (Vita *et al.*, 1998).

Large scale surveys in the UK, USA and EU countries show that mortality and the incidence of cardiovascular and respiratory illnesses are higher in lower socio-economic groups (Pocock *et al.* 1987; Helmert *et al.*, 1990 and 1994; Smith *et al.*, 1990; Mackenbach *et al.*, 1997; Ramsay *et al.* 2008). These health inequalities are due to a mixture of environmental and behavioural factors. A lower level of recreational physical activity is one of these factors (Pocock *et al.* 1987; Ramsay *et al.* 2008; Helmert *et al.*, 1990; 1994).

It is clear from these and many other studies that regular physical activity is associated with reductions in morbidity and mortality, particularly from cardiovascular disease and diabetes. A review of the evidence concludes that the evidence for the effectiveness of physical activity in preventing obesity, cardiovascular disease, diabetes, cancer, hypertension, depression and osteoporosis is 'irrefutable' (Warburton et al, 2006, cited in Jorgensen, 2010). There is some dissent, however, about the linearity of the effect or whether only "vigorous" activity makes a significant contribution. It is also clear that though this link between health and physical activity has been well known for many years, many people are not physically active. Allender *et al* (2007) have concluded that physical inactivity is directly responsible for 3% of the morbidity and mortality in the UK. The next section discusses whether the presence of nearby outdoor space influences the likelihood of people taking exercise.

2.2.2.2 Relationship between outdoor space and physical activity

Anyone who has walked through Hyde Park, London, on a sunny afternoon and seen the crowds of people of all ages out walking, running, cycling, doing aerobics, skating, playing football, tennis, cricket and golf can only believe that having such a space available must encourage people to do these activities. This section looks at the evidence for this assumption.

The features of any environmental setting can either encourage or inhibit activity in that setting. Gibson (1979) coined the term *affordances* to describe the interplay between what an environment offers and the individual animal.

The *affordances* of the environment are what it *offers* the animal, [including the human animal] what it *provides* or *furnishes*, either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment." p127 (Gibson's italics, Griffin's brackets)

The affordances offered by a man-made, built environment to a wide range of different people can be improved by good design and management. In fact, providing a range of affordances may be the definition of good design.

The reasons why some people are more physically active than others are complex, involving social and environmental, as well as psychological and physical factors. A study of factors supporting the take up and maintenance of vigorous physical exercise found that for men, having a supportive local environment (safety and ease of exercising in neighbourhoods and frequency of seeing others exercise) is significant for sedentary men who take up moderate levels of physical activity, but not for those who move on to more intensive exercise, nor for women. For women the key predictors are education and support for exercise from family and friends (Sallis *et al.*, 1992). This latter factor is also found to be significant in Sternfield's study (*et al.*, 1999) of the activity levels of a racially mixed sample of women that, unusually, included energy expended running a household and caregiving. It found that younger, leaner, white, well-educated women with encouragement to exercise from family and friends and no young children at home are most likely to be engaging in recreational physical activity. Afro-

American, Asian and Hispanic women, not only engage in less sport or exercise classes, but also perceive more external obstacles, such as lack of nearby facilities, than Caucasians. This may represent a scarcity of facilities in the areas where they live or lack of knowledge about existing facilities or it may be caused by feeling uncomfortable about using what is available.

Stahl *et al.* (2001) found that the proportion of active people varies widely between European countries. The social environment (support from family and friends) is the strongest predictor. Those who perceive low support are more than twice as likely to be inactive. Physical environment influences levels of activity, but less strongly than the researchers had expected.

Research using data from the American Third National Health Examination Survey (NHANES III) investigated the relationships between leisure physical *inactivity* and years in education, family income, poverty index ratio, racial group, employment, occupation, and marital status (Crespo *et al.*, 2000). In all racial groups women, the low paid and those with less education were more inactive in their leisure time than men, the better paid and more educated. The only deviation from this was that Mexican-American women with 16 or more years in education were more likely to be inactive than those with 13–15 years in education. They also found that a smaller proportion of Caucasian white people were inactive in their leisure time than African- or Mexican-Americans independently of all the other factors. This suggests that social or cultural factors influence people's level of physical activity.

Kaczynski and Henderson (2007) reviewed fifty studies that related the presence of parks and recreation settings to levels of physical activity. In

twenty (40%) of them all or most of the relationships between parks and recreational settings and levels of physical activity were positive. In a further twenty (40%) results were mixed, while nine (18%) found no significant associations and one, only negative relationships. The seventeen studies examining trails, found that proximity did increase levels of walking and cycling as modes of transport, but not for leisure. Of the thirteen studies examining the effect of nearby parks on levels of physical activity, seven found strong positive associations, while the rest produced mixed results. Levels of walking and cycling appear to be more related to the availability of good routes to local destinations, than to the provision of parks. The Greenspace Scotland reviews of greenspace and quality of life (Bell *et al.*, 2006) and of links between greenspace and health (Croucher, Myers and Bretherton, 2007) similarly find some strong positive and some mixed associations between levels of physical activity and nearby parks. Watts *et al.* (2011), however, found no relation between levels of physical activity and neighbourhood characteristics, including provision of outdoor space, in forty deprived London Boroughs. This may have been due to lack of variation between the different neighbourhoods.

Research in the USA suggests that proximity of parks and recreation grounds does increase the likelihood of adults, adolescents and children engaging in physical activity (Cohen *et al.*, 2006; Roemmich *et al.*, 2006). Cohen *et al.* (2007) found that young men were the most likely group to visit public parks and that men are twice as likely as women to engage in vigorous physical activity whilst there. Proximity to the park predicts both use and exercise for both genders. Research into the levels of physical activity of older people in Australia (Booth, 2000), and Scotland (Sugiyamaa and Ward Thompson, 2007), shows that the proximity of “walkable” green spaces is a factor in

increasing physical activity. Yet Hillsdon *et al.* (2006) found no clear link between access to green outdoor space and levels of recreational physical activity in his study of 4,732 people aged between 47 and 74 years.

Much of this research relies on people reporting their level of physical activity in questionnaires. These may give reliable assessments of vigorous programmed exercise, such as team sports, running and visits to the gym, but people's memories of levels of day to day activities such as walking, gardening and particularly housework, are less reliable (Besson *et al.*, 2010). Also one person's idea of vigorous walking may be quite different from another's. Validation of questionnaire measures against accelerometer readings do not show good correlations (Hardman and Stensel, 2009), but the study by Besson *et al.* (2010) found that their Historical Adulthood Physical Activity Questionnaire accurately ordered a cohort of people in terms of accelerometer measurements of physical activity. Self-report via the questionnaire tended to underestimate levels of physical activity except for the most sedentary people who tended to over-estimate.

Most of these studies have no measures of the attractiveness or quality of the outdoor spaces nor of the facilities available (Cohen *et al.*, 2006, 2007 are exceptions), but they do suggest that people, particularly if they do not drive, are more likely to use outdoor spaces that are nearby. What is clear from the research, is that most of the people who use a park regularly live close by and that people who use a park are more likely to be physically active (Croucher, Myers and Bretherton, 2007). Research on the 'walkability' of public spaces and streets (Burton and Mitchell, 2006; Humpel *et al.*, 2004; Moudon and Lee, 2003, Pikora *et al.*, 2002; Saelens *et al.*, 2003; Sugiyama and Ward

Thompson, 2007) demonstrates that perceptions of the supportiveness of the environment influences how physically active people are.

The next section examines research attempting to link the presence of green outdoor spaces directly with health outcomes.

2.2.2.3 Relationship between green outdoor spaces and health outcomes

Recently, researchers have examined the direct links between green outdoor space in a local area and different health outcomes of residents. Takano *et al.* (2002) found that older people living in Tokyo with a nearby “walkable” green space, be it a public park, street with trees or residential area, were less likely to die during the five years of their study than those without such space. This was independent of age, sex or socio-economic status. Five-year survival rates also increased with increasing hours of sunlight at their residence.

Mitchell and Popham (2008) used secondary data from the Office of National Statistics to investigate the relationship between the area of green space (excluding domestic gardens) in a Lower Super Output Area (LSOA) and working age mortality rates. As explained on the National Statistics website (Office for National Statistics, 2011) Lower Super Output Areas are a geography for the collection and publication of small area statistics formed by aggregating four to six Output Areas from the 2001 Census. They are more similar in population size than electoral wards and less likely to have had their boundaries changed. This makes them suitable for comparisons of data across England and Wales (a different unit is used in Scotland). LSOA’s have an average population of 1,500 (as measured in 2001) and a minimum population of 1,000 residents and 400 households. There are 34,378 Lower

Super Output Areas in England and Wales. (Office for National Statistics, 2011).

Mitchell and Popham (2008) studied a population of 40,813,236 (the working age population of England) which had suffered 366,348 deaths in the years 2001 to 2005. Using the 2004 English index of multiple deprivation domains related to each LSOA, they controlled for other factors that might affect mortality, such as income, education and employment deprivation. They also controlled for housing density and air quality. They found that people exposed to larger areas of green space are likely to be less deprived, but in such a large sample there were significant numbers of people who were exposed to each combination of deprivation and green space area. They also confirmed that mortality rates increase with income deprivation. The analysis found an independent inverse relationship between area of green space and mortality and that as exposure to green space increases, the rate of increase of mortality with income deprivation is reduced. There was a similar relationship between area of green space and death caused by circulatory disease, but not for deaths from lung cancer nor self harm. This study had no information about the quality of the green spaces or whether populations had access to them, but does suggest that, through a mixture of mechanisms, the presence of green space improves health outcomes.

In the Netherlands, a sample of over 250,000 people answered a questionnaire about their health (Maas *et al.* 2006). Their responses were related to the area of green space (excluding private gardens) within 1 km and 3 km circles centred on where they live. The percentage of people rating their health less than good declined steadily from 16% to 10% as the percentage of green space within 1 km or 3km of where they lived, increased from 10% to

90%. This was independent of the degree of urbanity (number of households per sq km). The relationship operates for all age groups, but in strongly urban areas green space seems to offer perceived health benefits to older and younger people, but not to those between 25 and 64 years. This suggests some stage of life effects. Proximity of green space was only important within these strongly urban areas. As in other studies (de Vries, *et al.*, 2003) linking green space and health outcomes, the effect is stronger for those who tend to spend most time close to home: the elderly, children and housewives.

A study of mortality in the 6432 urban (population of settlement > 10,000 (DEFRA, 2005)) wards in the UK (28.6 million adults aged 16 – 64 years) found a significant lowering of mortality rates due to cardiovascular and respiratory diseases in men with increasing area of green space in the ward (Richardson and Mitchell, 2010). This was after controlling for income deprivation, air pollution and smoking. A similar effect was not found for women. This is partly because, below the age of sixty-five, mortality from cardiovascular disease is much lower in women than in men. Had older people been included, as they were in the Dutch study (Maas *et al.* 2006), an effect might have been found for women too. There may also be a cultural effect, perhaps women perceive more barriers to using public outdoor spaces in the UK than they do in the Netherlands. Research in the U.S.A. suggests that in cities, women are less likely to use local parks than men (Cohen, 2007).

These studies all measure quantity rather than quality of, or access to green space in a specific area, and exclude domestic gardens. At the time of writing no large-scale analysis of the links between quality of local green space and people's health has been done.

Several mechanisms have been suggested for the link between green space and health. As outlined in Section .1.1. the role of trees and shrubs in cleaning the air of pollutants and dust is well understood. This mechanism has an impact on nearby residents, even if they do not access the space. Another possible mechanism is the encouragement of residents to engage in physical activity. It appears from the literature that outdoor spaces that provide attractive routes to local destinations do increase levels of walking and cycling as modes of transport and that physically active people are attracted to nearby outdoor spaces. The evidence suggests that nearby outdoor spaces provide an environment for recreational physical activity, particularly for children and young people, but plays a minor role in encouraging people who are relatively inactive to increase their levels of physical activity.

2.2.3 How urban outdoor space affects people's health – psychological and emotional benefits

2.2.3.1 Space and the mitigation of over-crowding

Between 1736 and 1901 the population of Sheffield increased from 14,105 to 410,991 (Robertson, 1905). This was typical of cities in Europe and the East Coast of America as rural populations moved to the cities in search of work, much as is happening in the developing world today. This rapid growth in population and the low wages paid to most of these migrants, resulted in families being crammed into existing housing, resulting in overcrowding, and lack of light, water and sanitation. Charles Booth (1892) estimated that in London, 128,000 families of 4 to 12 people were living in single rooms. In 1908 New York, families lived in 360,000 rooms that received no daylight at all (The Lancet, 1912). Such areas rapidly became slums where outbreaks of typhus, tuberculosis and cholera originated (Special Sanitary Commissioner,

1910; L.C.C., 1953; Drucker *et al.*, 1994). There was much concern amongst doctors and public health professionals about the impact of this on physical, psychological and emotional health. Many advocated the provision of public open spaces so that people living in overcrowded conditions could enjoy space, sunshine and relatively fresh air.

“Except in the case of a few of our towns, such as Edinburgh and some others, where the natural configuration of the site has compelled the provision of large open spaces near central districts, in few of them has sufficient breathing space been allowed for health purposes, or for the amusement and pleasure of the adults. Bricks and mortar and soot lead to physical inefficiency and ultimately to ill-health.” (Robertson, 1905, p. 554)

Today, in Great Britain, the provision of clean water, sanitation and health services has eliminated mass outbreaks of disease, but tuberculosis is on the rise as some households become increasingly over-crowded (Elender, Bentham and Langford, 1998). There is a long running debate in the literature about what harm is done to psychological well-being by living in crowded conditions. A distinction is made between high density and being crowded. The latter only occurs if a person has less space than they feel in need of. Most studies on the impact of crowding in the 1970's did not control adequately (or at all) for socio-economic factors (Solari and Mare, 2011). Research has shown that people's perception of crowding varies widely and is only weakly related to physical density of people in the household (Stokols, 1976). Feeling over-crowded can cause psychological withdrawal from others, leading to isolation, depression, frustration and aggression and can inhibit child development (Gove, Hughes

and Galle, 1979; Wenz 1984; Solari and Mare, 2011). One important predictor of not feeling crowded is the ability of a person to get as much privacy as they require and to be able to remove themselves from the immediate environment when they wish to (Schmidt *et al.*, 1979). If people can get away by themselves as much as they want they don't feel crowded. If they have more privacy than they need, they feel isolated. The provision of outdoor space in dense urban environments therefore provides a place where people might go for privacy and escape from crowded conditions or go to find the company of other people (see Section 2.2.4). Fried (1984) showed that adequate space per person in the dwelling, access to the outdoors and a nearby large open space are significant components of residential satisfaction (n=2622), together with housing quality and neighbourhood satisfaction.

2.2.3.2 Restoration and Relaxation

The studies discussed in Section 2.2.2.3. demonstrate a link between the area of green space in a locality and the health of its residents. One possible mechanism for this association is encouragement to more physical activity. Other possible mechanisms link green space and psychological health.

2.2.3.2.1 The effect of natural scenes on people

Two strands of response to natural places are woven through human history and through the human psyche. These are apparent in the work of writers, artists and philosophers who have celebrated 'nature' as nourishing to mind and soul or have depicted her as a threatening "unknown" and source of disorder. The forest is a source of terror in many central European folk tales and modern Europeans share these mixed responses to woodland (Jorgensen *et al.*, 2002, Jorgensen and Anthopoulou, 2007).

Studies of responses to photographed scenes have established that many (but not all) North American and European people prefer landscapes that contain trees and/or water (Kaplan *et al.*, 1972; Ulrich, 1981). 'Natural' landscapes are preferred to urban ones and responses are more positive to urban landscapes that contain trees than to those that do not. The term 'natural' is interpreted rather broadly.

In general, American groups tend to categorize views as 'natural' if the landscape content is predominantly vegetation and/or water, and if man-made features such as buildings or cars are absent or inconspicuous. (Ulrich, 1986, p.36).

Many people prefer an ordered 'natural' landscape to a wild one, because it is easier to make sense of (Kaplan *et al.* 1998) and may appear less threatening (Burgess *et al.*, 1988; Jorgensen *et al.*, 2002; O'Brien, 2006; Özgüner and Kendle, 2006). Kaplan *et al.* (1989, 1998) suggest that the most preferred environments meet the human need to understand our surroundings and the urge to explore. Preferred scenes have 'coherence' or organisation and 'legibility', that is, recognisable features that enable navigation. They also have 'mystery' (the promise of new, interesting information further on) and are therefore enticing. They also found that people prefer scenes with a smooth ground. A smooth ground is easy to walk on and mystery draws one onward. This suggests that people imagine themselves in the landscape when viewing photographs of scenes, which supports the use of photographs as proxy for actual landscapes.

Mystery is also strongly related to the perception of danger depending on the context (Herzog and Miller, 1998). An urban alley with a bend in it is more

likely to be associated with danger than preference. 'Openness' the amount of space perceivable to the viewer, is a negative predictor of preference. People tend to feel exposed in wide spaces and prefer the edges of spaces where there is some cover (Cooper-Marcus and Francis, 1998). The presence of agricultural crops, scrubland and weedy fields also reduces preference.

Ulrich (1986) agrees with this analysis and adds 'complexity' (number of independently perceived elements), a focal point, 'depth' in the scene and absence of perceived threat as important elements. Humans respond positively to natural environments as long as they feel safe. Feeling safe is related to having good visibility and what Hertzog and Kutzli (2002) call 'locomotor access', which is akin to the preference for smooth ground. More recent studies do not agree on the importance of complexity and depth. Ulrich (1986) sums up the above attributes as preference for a savannah like landscape.

Experimental studies show that natural scenes induce different responses in the human body and brain than urban scenes do. For example, students reported an enhancement of positive emotions after seeing sets of slides of natural scenes with trees or water, but no such enhancement was reported by those who saw a set of slides of urban scenes with no vegetation nor water (Ulrich, 1979, 1986; Hartig *et al.*, 1996). The slides of natural scenes also maintained the attention and interest of the participants better than the urban set and higher amplitude alpha waves (associated with wakeful relaxation) were recorded from the viewers' brains while they viewed the natural slides (Ulrich, 1986). This suggests that natural scenes trigger different brain activity to urban scenes.

Studies of individuals in real landscapes, support the preference for water and trees, but also the avoidance of dark, thick woodland such as spruce forest and a preference for more open woodland with glades or forest rides (Sonntag-Öströma *et al.* 2011). People experienced improvements in mood and in cognitive function after walking in a forest or a country park, compared to those who took an urban walk (Hartig *et al.*, 2003; Mayer *et al.*, 2005; Roe and Aspinall, 2010; Shin *et al.* 2011). Those with poor mental health showed similar improvements on a smaller scale after an urban walk, though it is not clear if this was due to historic and green elements in the urban environment, or due to the social context of the walk (Roe and Aspinall, 2010).

The diastolic blood pressure of students in a room with window views of a natural scene reduced after a period of stressful activity during a ten-minute wait before the next phase of an experiment. The diastolic blood pressure of those waiting in a windowless room increased slightly (Hartig *et al.*, 2003). There was no group waiting in a room with views of a built up scene, so it is not clear if simply having any outside view causes the effect. Those subsequently walking in a forest maintained lower blood pressure than those taking an urban walk, though this effect started to converge after about 20 – 30 minutes. This was at about the point where the participants turned back, possibly reminding those in the natural setting that they would soon return to their everyday life and causing those in the urban setting to feel relieved (Hartig *et al.*, 2003).

Young people returning from a wilderness trip of a few days showed an increase in proof-reading performance, an indicator of enhanced levels of directed attention, whereas those who returned from a holiday in a non-wilderness environment or had no holiday at all, declined in performance. (Hartig *et al.*,

1991). Those who had been on the wilderness trip were slightly depressed on their return, but 21 days later they scored higher on the Overall Happiness Scale (OHS) than the others (Campbell *et al.*, 1976, cited by Hartig *et al.*, 1991). This suggests that despite a flat feeling on their return, their trip may have set them up better to cope with everyday stresses over time. Students who went for a 40 minute walk in a park after an exercise which induced mental fatigue reported higher levels of Overall Happiness and positive affect than those who had taken a walk along city streets or those who had relaxed indoors in a comfortable chair with magazines and a radio (Hartig, *et al.*, 1991). They also showed reduced levels of anxiety and aggression and performed better in a proof reading test.

Having a natural view may speed healing. Patients recovering from gall bladder surgery in a room with a view of trees through a window needed fewer analgesics and were ready to leave hospital sooner than similar patients with a view of a brick wall (Ulrich, 1984). Though, as Parsons (1991) points out, the fact that the former view was more complex (and hence interesting) than the latter may have been as important as the presence of trees. Looking out on a brick wall may make patients feel trapped and therefore slow healing. What is clear is that the view from the window influences patients' progress. Having access to nearby nature has been shown to reduce the impact of stressful life events on children (Wells and Evans, 2003). There is a large body of research on the beneficial effect of therapeutic gardens on those recovering from surgery and mental distress (Cooper Marcus and Barnes, 1999; Sherman *et al.*, 2005), which is not discussed here.

2.2.3.2.2 Theoretical basis for positive responses to natural environments

Based on their experimental work, Kaplan and Kaplan (1989) ascribe the positive effect of natural scenes on people, to recovery from mental fatigue and the restoration of attention. They point out that in our everyday lives we have to consciously direct our attention to a myriad of tasks and other people. This involves making an effort to screen out distractions and is fatiguing. In a natural space, or viewing a natural scene, our attention need not be directed; we can just pay attention to whatever comes to our notice. This allows us to relax and rest our attention. They suggest that restoration from mental fatigue relies on involuntary attention being engaged with no effort. They call this property 'fascination', which is enabled by the properties of 'complexity' and 'mystery' in the environment. 'Fascination' is enhanced by 'being away' from everyday demands in a psychological sense, if not a geographical one; by 'extent', feeling immersed in a different world with no boundaries, and by 'compatibility' between what the environment offers and what the person wants to do (Kaplan and Kaplan, 1989; Kaplan *et al.*, 1998). As already discussed, experiments have shown increases in directed attention after such exposure (Hartig, *et al.*, 1991; Hartig *et al.*, 2003; Mayer *et al.*, 2005; Berto, 2005; Shin *et al.*, 2011).

There is nothing, however, in this early form of Attention Restoration Theory that explains the particular effectiveness of natural environments and it is clear that some urban environments have the same qualities (Parsons, 1991), hence the popularity of the "City Break". As the theory developed, it was suggested that there is an evolutionary aspect, something innate, in people's preferences for natural landscape (Kaplan, S., 1987).

Ulrich and others also add the evolutionary dimension (Orians, 1986; Ulrich and Simons, 1986; Ulrich *et al.*, 1991) and question that the key to the benefit of exposure to natural scenes is the restoration of attention. They point out that stressful situations also give rise to involuntary attention and suggest that it is the recovery from stress that allows restoration. Non-threatening natural landscapes enable stress relaxation, by appealing to something innate in us.

This effect has been demonstrated experimentally, by monitoring the recovery of slightly stressed students (Ulrich, 1979; Ulrich and Simons, 1986). Those looking at slides of unspectacular natural scenes showed a significantly bigger increase in positive affect, that is feelings of affection, friendliness, playfulness and elation and a decrease in fear arousal and anxiety than those viewing urban views with no natural elements. The scenes had been chosen to have similar levels of complexity, so the natural scenes tended to be scruffy and not particularly attractive and the urban scenes were unblighted and tidy. Those viewing the urban slides reported significant rises in feelings of sadness. These effects were independent of gender or whether the students had previously lived in rural, suburban, small town or city environments. Physiological measurements also indicate a more rapid and effective recovery from stress in those viewing natural scenes (Ulrich and Simons, 1986, Ulrich *et al.*, 1991). Wadeson *et al.* (1963, cited by Parsons, 1991) accidentally discovered, when using viewers of Disney nature films as a control group, that watching nature films lowers the levels of the stress hormone, cortisol, in the blood. Mayer *et al.* (2005) conclude that it is a feeling of greater connectedness to nature, rather than the improvement of attentional capacity, that underlies the improvements in positive affect and cognitive performance after exposure to natural scenes, and that the effect is stronger in real rather than virtual situations.

Ulrich (1983) suggests that there are two independent response pathways to sensory stimulation: a fast, innate, affective route and a slower learned cognitive one. This view is supported by some experimental studies (Korpela *et al.*, 2002) though there is some evidence that the affective pathway operates much more powerfully in assessing negative elements of scenes than positive ones (Hietanen and Korpela, 2004). Bourassa (1990) builds on the work of the Soviet psychologist, Vygotsky (1978; 1981; cited by Bourassa, 1990) and the psychiatrist May (1958; cited by Bourassa, 1990), to suggest that the human response to landscape (or to any environment or object) occurs through 'three modes of aesthetic experience'; the biological, the cultural and the personal. He goes on to examine the evidence for separate pathways from our senses to our limbic brain, which handles our biological, emotional responses (the need for self-preservation and the preservation of the species), and our neo-cortex, where language, and cognitive function resides. This suggests that biological and cultural responses are independent and both influence our personal response.

Further support for this view is provided by Balling and Falk (1982), who found that children prefer a savannah like landscape, but older children and adults add environments that they are familiar with to this preference. They suggest that this is because the appreciation of savannah-like landscapes is innate and rooted in our origins on the African plains and influenced by ancient biological imperatives such as the search for water and wariness of possible predators. Preference for other landscapes, including urban ones, is learned and influenced by culture.

2.2.3.2.3 Restoration in urban outdoor spaces

Many of the studies of preference discussed so far used photographic slides of landscape on the scenic scale in contrast to built up scenes. Similar preference studies using photographs of urban outdoor scenes give similar results: well-maintained, natural scenes including trees and or water are preferred by most people (Anderson and Schroeder, 2002). Preferred urban natural scenes, like wilderness scenes, have coherence and mystery (Kaplan 1984). Studies of people who visit parks suggest that the majority of users of green spaces prefer a 'natural' rather than an 'ornamental' style of space as long as it is cared for (no litter, for example) (Caula *et al.*, 2009; Crow *et al.*, 2006; Özgüner and Kendle 2006). What people mean by the terms 'natural' and 'nature' can cover a wide range of landscapes, however, from mown lawns and a few trees, to wilderness (Chiesura, 2004; Caula *et al.*, 2009; Crow *et al.*, 2006; Gobster, 2001; Ulrich, 1986).

Grahn and Stigsdotter investigated the connections between stress and use of urban green space in 9 Swedish towns and cities. They found that children visited green spaces and spent more time in them than adults and pensioners, but in those over seventeen there was no relationship between use of green spaces and age, sex and socioeconomic status. The average number of visits to urban open space in a year was 196 for the 20% of their sample (n=953) who reported the lowest levels of stress, irritability and fatigue and 133 for the 20% reporting highest levels of stress. The number of hours spent in such places was 311 and 186 respectively. 70% of those living in town or city centres and 66% of those living in suburbs wished that they could visit urban green spaces more often. These people were more likely to be stressed and lack of time was the most frequent reason given for not visiting

outdoor spaces. Those who did not have access to a garden or green space adjacent to their dwelling, reported higher levels of stress and were less likely to visit public green spaces. They did not compensate for their lack of green space at their home by visiting other spaces more frequently.

Many studies of specific parks have found that users report improvements in mood, relaxation, fatigue and levels of stress (Francis, 1987; Burgess *et al.* 1988; Kaplan *et al.*, 1989; Cooper Marcus and Francis, 1998; Chiesura, 2004). One of the main reasons given by visitors to parks and outdoor spaces for being there is for relaxation. 'To relax' was the reason given by 73% of respondents to a written survey distributed to people visiting a large park in Amsterdam. 'To listen and observe nature' was the second most frequent choice of over half the respondents (Chiesura, 2004).

Gidlof-Gunnarsson and Ohrstrom (2007 and 2010) found that residents of apartments exposed to substantial traffic noise reported less noise annoyance both at home and in the neighbourhood if they had access to quieter green spaces nearby. They were also less likely to feel 'very tired', 'stressed' or 'irritated/angry' than those with poor access to such spaces.

Kuo (2001) conducted a series of studies investigating the impact of nearby nature on people living in a large, inner city, public housing estate with high levels of deprivation in Chicago. The estate consists of a 3 mile long, single row of identical blocks of flats with major roads on either side. Residents of these blocks have many sources of stress in their lives. Those living in blocks with no nearby trees or grass reported difficulties more long standing, less soluble and more severe than residents of blocks with greener

surroundings and were also more likely to procrastinate when faced with major issues. They also reported higher levels of mental fatigue, aggression and violence (Kuo and Sullivan, 2001a). It appears that exposure to a greener environment enables residents to manage their lives better and to feel calmer. In another large public housing estate levels of both property and violent crime reported to police were lower in buildings with greener surroundings (Kuo and Sullivan, 2001b). In both these estates residents were assigned randomly to a particular block.

Explorations of restorative environments in the city show that people turn to a range of activities in different environments from the home to the city centre when mentally fatigued (Hartig and Staats, 2006). They are more likely, however, to seek out a park or greenspace when fatigued than they do when not fatigued. A key finding shows that people prefer to be alone when fatigued, which means that the daily commute, as part of an anonymous crowd, is, for some people, a time of restoration between the demands of work and home life (Staats *et al.*, 2010). An urban park also provides a destination for a person who needs some time alone. People who have higher levels of negative mood seem to be more likely to seek solitude and natural places (Korpela, 2003) and those who are feeling stressed appreciate the natural aspects of urban green spaces rather than the social ones (Grahn and Stigsdotter, 2010). Young people who were allowed as children to play freely in woodland see woodlands as good places to go to escape from everyday life and be alone (Milligan and Bingley, 2007; Ward Thompson *et al.*, 2008).

2.2.3.3 Enjoying urban nature

City dwellers display a range of attitudes towards wildlife and nature (Kellert, 1984; Gobster, 2001). Kellert describes the attitude found most frequently in his study, as 'humanistic': a relationship with individual animals or birds and an emotional attachment to specific places. Next most frequent was a 'moralistic' abhorrence of exploitation of natural places and cruelty towards living creatures. About 30% of his sample (n=1392) expressed some 'negativistic' attitudes, preferring to avoid contact with animals and natural objects altogether, while positive interest in environmental issues was expressed by about 20% of the sample (Kellert, 1984). Nearly 30 years on, attitudes towards the environment may have changed, with increasing awareness of human dependence on the natural world. Conservationists are, however, concerned that as cities expand, increasing numbers of people have few opportunities to engage with natural environments and that this leads to less interest in environmental issues (Miller, 2005). Mehtälä and Vuorisalo (2006) point out, however, that in Europe, there is increasing concern about looking after the environment, despite urbanisation. They also comment on attitudes changing since the mid-20th Century. For example, collecting birds' eggs used to be considered an acceptable hobby.

There is evidence that regular contact with nature increases the sensitivity of city residents to environmental issues (Miller, 2005; Rohde and Kendle 1994, cited by Savard *et al.* 2000; Kellert, 1984; Hansen-Ketchuma *et al.*, 2011). A proportion of the urban population wants to have opportunities to experience natural environments in the city (Kellert, 1984; Harrison and Davies, 2002; Chiesura, 2004; Ward Thompson *et al.* 2005; O'Brien, 2006). This is demonstrated by public support of tree planting and community gardens and the efforts made to protect natural spaces when threatened by development or

road building (Harrison and Davies, 2002). Also house prices are increased by proximity of attractive, well looked after green spaces (Bark *et al.* 2009).

Threats to, or losses of, nearby natural spaces or trees cause residents to be more sensitive to these issues and to be more likely to take an active part in stewardship activities (Hunter, 2011). For example, the increase in financial and volunteer support after the “great storm” that devastated trees across South Eastern England on 16th October 1987 enabled the Tree Council to set up a highly successful volunteer Tree Warden scheme, which has a network of over 8,000 wardens (www.treecouncil.org.uk/tree-wardens)

The landmarks we had grown up with, that had seemed to have a reassuring permanence, we now recognised were highly perishable. And we knew we would never take them for granted again. (Watkins, 2011)

2.2.4 The social benefits of urban outdoor space

As well as providing the health benefits described in sections 2.2.1 to 2.2.3, urban outdoor spaces provide meeting places where city residents can interact. Some of the resulting social benefits are explored in this section.

2.2.4.1 Meeting places

In their review of ninety empirical studies of urban outdoor spaces reported in *Landscape and Urban Planning* between 1991 and 2006, Matsuoka and Kaplan R. (2008) identified a range of human-interaction needs amongst the themes of the studies. These included social interaction (29 studies) and community identity (19 studies). They commented that ‘These studies expressed great optimism that improved social interactions can be promoted through properly designed urban spaces.’

Maas *et al* (2009) investigated whether increased social contact is a mechanism for the positive relationship between green space and health. They found a relationship between increasing area of green space within 1km of the home and decreased feelings of loneliness and lack of social support. These relationships were strongest for children, older people and those on lower incomes (that is people more tied to the area around the home) and particularly strong in dense urban areas. They found no relationship between area of green space and number of social contacts and hypothesise that more green space is related to developing a better sense of community.

A series of studies in a deprived social housing area in Chicago found links between green outdoor spaces and social connections. Sullivan *et al.* (1996) observed individuals in 27 relatively green and 32 relatively barren, outdoor spaces in a residential development. They found increased social activity in the greener areas. Coley *et al.* (1997) and Gold (1977) found strong relationships between the presence of trees and the amount that different semi-public outdoor spaces are used by people in social housing developments. Spaces with trees attracted more people, both adults and youths, than spaces without trees. They also found that the closeness of the trees to the housing and the number and arrangement of trees is influential. Kuo *et al.* (1998) found that neighbourhood social ties are stronger where residents spend time in common space and that they spend more time in spaces with higher levels of vegetation. Kweon *et al.* (1998) interviewed 91 older adults and found a modest link between the amount they used their outdoor shared spaces and the strength of their social ties and sense of community. These results are from an area with very little green space, where a few trees may well attract people to a space. Their applicability to more green areas is unclear. Public green spaces have

been found to aid the meeting of children of different cultures in Zurich (Seeland *et al.*, 2005)

Social interaction is encouraged by design that encourages walking to near-by destinations and attractive parks may be a destination in themselves. A local park, plaza or green space is a venue where people meet each other either by arrangement or through happenstance. They are often important in the social lives of specific groups such as teenagers or retired people (Burton and Mitchell, 2006; Cooper Marcus and Francis, 1998; Field, 2000; Kim and Kaplan, 2004; Sugiyama and Ward Thompson, 2007).

2.2.4.2 Community gardens

Community gardens occur in cities across the world, often on land which was lying derelict, sometimes with the support of local government agencies and sometimes spontaneously. They are often started through the enthusiasm of a small number of people who encourage other local residents to become involved and help clear and secure the land.

Community gardens vary in what they offer depending on the needs and dreams of those involved (Ferris *et al.*, 2001). Some are focused on growing fresh food, others on providing a beautiful space for relaxation. They all provide a green haven in the city, though usually only for members. In many cities the survival of these enterprises is supported by local authorities or independent organisations, who provide funding and expertise on both gardening and the legal processes that need to be navigated to secure the garden's long term future.

Researchers have assessed the benefits of these gardens and found them to be wide ranging. Members gain improvements to physical health through the

provision of fresh vegetables and exercise and to psychological and emotional health through involvement with other people in a project. They learn gardening skills and the skills required to work with other people, run an organisation and get support and funding. Working and enjoying social events and celebrations together builds relationships and social networks and the impact sometimes spreads out beyond the membership to the local community (Glover *et al.*, 2005; Gough, 2007; Kingsley and Townsend, 2006)

Community gardens in impoverished communities can be a major resource which transforms people's lives (Armstrong, 2000; Schmelzkopf, 1995):

Over and over gardeners told of how gardening and socializing in the garden make them feel as though they are a part of the community and a part of the land, even in the midst of the dirty, crime-ridden streets of Loisaida [New York]. A nonnegotiable rule of most gardens is that no drugs are allowed, which keeps the drug dealers away and some gardeners away from drugs. Many individuals said that if they or their children were not in the gardens, they would be out getting high. In overcoming the challenges of creating and sustaining the gardens, the gardeners develop a common goal and have immediate contact with each other...Many girls and women explain that a garden is a place where they can feel safe yet still be outside with other people. A garden offers security and opportunity for women who are restricted by lack of money, the dangers of the street and responsibilities for children. (Schmelzkopf, 1995, p.373)

Sustaining a community garden in the long term is hard work. There are many threats: internal ones such as waning enthusiasm, conflict or the loss of key people and external ones such as landlords wanting to reclaim their land, loss of funding, complaints from neighbours and vandalism (Glover *et al.*, 2005). Local authorities have been more supportive since the development of Local Agenda 21 initiatives in the 1990s which increased the interest in sustainable development (Ferris, *et al.*, 2001). Community gardens are recognised as linking health, education and community development goals.

2.3 The factors that influence how much an outdoor space is used

The foregoing discussion shows that residents of cities gain a range of health and social benefits from the availability of public outdoor spaces, particularly green spaces. Research on usage of plazas and parks, shows that good maintenance and semi-permanent features such as mature trees and how green a space is, influence preference (Altman and Zube, 1989; Cooper Marcus and Francis, 1998; Gold, 1972; Kuo *et al.*, 1996; Nordh *et al.*, 2011; Sullivan and Lovell, 2006;) and how the space is used (Bell *et al.*, 2006; Coley, *et al.*, 1997; Gold, 1977; Hayward & Weitzer 1984; Kaplan and Kaplan, 1989; Kuo *et al.*, 1996; Shaffer & Anderson, 1985). Some studies suggest that these structural features have more influence on people's choice of park than do decorative elements, such as flower beds (Nordh *et al.*, 2011; Özgüner and Kendle, 2006). For older people seating and clean toilets are paramount (Mitchell and Burton, 2006). Design therefore has a strong influence on how much a park is used (Goličnik and Ward Thompson, 2010)

The Project for Public Spaces (2000) has researched more than 1000 public outdoor spaces across the world. They have concluded that accessibility,

activities, comfort and sociability are the key to success. Places fail because of: lack of spaces to sit; lack of gathering points; poor entrances and visually inaccessible spaces; dysfunctional features (broken or not working); paths that don't go where people want to go; domination by vehicles; blank walls or dead zones around the edges; nothing going on.

2.4 The importance of private, shared residential outdoor space

This research is interested in the outdoor space provided for the exclusive use of inhabitants of residential buildings, particularly where it is shared by several dwellings. This is referred to as residential outdoor space or ROS. Two types of ROS are considered: ROS shared by several households and for comparison, individual ROS attached to single family dwellings. ROS is likely to provide similar benefits to public outdoor space, but has the advantage of being nearby and easier to access. ROS is important as an extension of the home (Petticrew *et al.*, 2009). Residents can design their individual ROS to suit themselves and feel free to do as they like within the bounds of proprietary. It fulfils practical functions such as providing space to dry clothes and a secure place for children to play in. Where such space is shared, however, the degree to which residents can control its design and what happens in it is diluted.

In 'Housing as if People Mattered' Cooper Marcus and Sarkissian bring together 20 years of post occupancy evaluations from the US, UK, Canada, Australia and Europe to outline 254 guidelines for architects and planners (Cooper Marcus and Sarkissian, 1986). They report that studies of housing show that satisfaction of residents depends strongly on the attractiveness of the development, which means variety, colour, landscaping, pleasant views, a 'non-institutional appearance' and most importantly good maintenance.

It is inappropriate, whatever the budget, to regard landscaping, site layout, play areas and community facilities as luxury extras. All the evidence suggests that a medium- or high-density family development designed with little concern for these features will be doomed to failure, no matter how much effort and budget were spent on building interiors. (p46)

If children are not provided with space to play they will colonise parts of the site, not intended for their use, where normal wear and tear will be perceived as 'vandalism'. Coleman (1964, 1984), however, found that litter, graffiti and vandalism were more likely on estates that have a children's play area as this encouraged children from other estates into the area. She counted a play area as a 'design disadvantage', but she was looking at estates with many other such disadvantages. It could be that in a well maintained development that has no other design disadvantages a well located play area brings more benefits than problems.

Dozens of housing-preference studies find that most English-speaking families report that their ideal home would be a house with a garden, so Cooper and Sarkassian (1986) suggest that developments that reproduce some of the features of this ideal will be more successful. These features include a private entrance at ground level, parking reasonably close to home and some private open space (garden, patio, yard or balcony). Residents need to be clear about where their territory ends and their neighbours' or the public domain begins.

‘Privacy is a more basic and universal need than community or neighborliness. The architectural concern with neighboring and community is commendable, but privacy must be established before people will reach out into the community.’ (Cooper Marcus and Sarkissian, 1986, (p.66))

Newman (1973, 1976) compared the design features of 169 housing estates in New York with their levels of crime. Using Jacob’s (1961) concept of ‘defensible space’, he assumed that criminals want to avoid being observed or identified and prefer a choice of escape route. Design features that reduce anonymity, allow casual observation of the outdoor spaces and minimise the number of access points to the site are therefore associated with lower crime rates. His study also emphasised the importance of residents being clear about what was their territory. Residents do not perceive large expanses of undefined outdoor space as theirs and therefore do not take responsibility for it or attempt to control what happens there. He recommended that outdoor spaces should be related to the buildings so that they are easily observed from inside the dwelling and should be clearly defined as public or private. Other factors that he found to be associated with higher crime rates included the overall size of the development, the building height and the number of households sharing an entrance. He established the importance of these features by making design changes that resulted in reductions in crime rates.

Coleman (1964, 1984) developed these ideas in her investigation of the relationship between design features and levels of litter, graffiti, vandalism, urine and faeces in entrances and the number of households with children in

care. Her team mapped all the social housing blocks of flats in Tower Hamlets and Southwark in London and 54 in Blackbird Leys, Oxford; 4,099 blocks in all. They found that all these outcomes were worse on developments where the design made it hard for parents to supervise their children and for residents to control the outdoor spaces.

They defined 'design disadvantages' for residents if there are more than:

12 dwellings per block	(increased anonymity)
6 dwellings per entrance	“ “
4 dwellings per corridor	“ “
50 dwellings per site	“ “
3 storeys	“ “
1 storey per dwelling (flats only)	(though she could not explain this)
1 block per site	(outdoor space clearly belongs to block)
or 3 or 4 blocks around a courtyard	
1 access to the site	“ “ “ “ “ “ and reduces escape routes

Other disadvantageous features, which provide multiple escape routes are:

- Overhead walkways
- Interconnections between stairs or lifts
- Interconnections between building exits

and prevent observation of outdoor space from ground floor flats:

- Dwellings above ground floor garages
- Dwellings on stilts

and prevent public surveillance or provide hiding places:

- Entrances to blocks face away from the street
- Entrances are open apertures with no door

and encourage strangers to enter the site:

- A children's playground

Coleman considers that individual blocks should have their own well-defined outdoor space preferably at the front and the back, with only one access to the site. This clarifies the difference between public and private space and means that residents understand which area is their territory. She uses the term 'confused space' to describe outdoor space that people are uncertain about because it is shared by many people.

In her study of Easter Hill Village Cooper (1975) found that while good design can make life more pleasant for residents, design mistakes (such as poor siting of a playground) can have a greater impact on their life. Herbert Gans, in his foreword to her book, suggests that this research supports his own hypothesis that 'designers major impact on people is in the amount of space, inside and out, which they are able or willing to supply to people, and that the greatest negative impact of design results from the lack of sufficient space.' (p. xvii). It follows that where space is scarce, as in dense urban developments, a key role of the designer is to use the space available as effectively as possible.

These studies highlight the importance of shared residential outdoor spaces being small enough in scale for people to recognise them as 'theirs'. One way to encourage residents to take responsibility for larger shared outdoor spaces is to apply the principles of community gardening (Section 2.2.4.2). This has been tried with mixed success in social housing developments in several cities in Great Britain. The Neighbourhoods Green Initiative supported by CABI, the Design Council and several other partners have produced guidelines and support for housing associations, local authorities and community groups who are working to improve the quality of their outdoor space (Frith and Harrison, 2004). The Edinburgh Backgreens Initiative, for example, has worked with residents of

tenements to clear and restore their neglected backgreens (Robertson, G., 2004). These initiatives have worked hard to involve residents in the improvement of their ROS and have supported considerable improvements in shared outdoor spaces. Engaging more than a few residents in the practical work involved has been much less successful (conversation with Greig Robertson, February 2008).

Other research into shared outdoor spaces focuses on specific situations, for example sheltered housing and care homes (Carstens, 1985) and therapeutic gardens (Whitehouse *et al.*, 2001).

The study of gardens has concentrated on famous gardeners and gardens and neglected the domestic garden. In particular there has been little research on how people use their gardens. Bhatti and Church (1999 and 2004) investigated the nature and meaning of the domestic garden. They found that most people talk of their gardens as a place for relaxation and 'to get away from it all' (though it was not clear what people want to get away from). Only about a fifth of those with gardens are keen gardeners, others are reluctant and see gardening as a chore or they like gardening, but have little time or energy for it. About a fifth actively encourage wildlife and see contact with nature as an important use of their garden (Cammack *et al.*, 2011). People gain psychological and emotional benefits from the activity of creating and looking after a garden (Gross and Lane, 2007; Kaplan, 1973; Kellett, 1982; Loram *et al.*, 2008).

The SHARP (Scottish Health, Housing and Regeneration Project) study, which was looking at the impact of re-housing on residents' health found that the

layout of shared space influenced how it was used. (Gibson *et al.*, 2008). Residents who were concerned about anti-social behaviour found that the boundaries of individual private gardens were usually respected. At the same time they valued the communal spaces as places to meet their neighbours. They preferred these spaces to be open because enclosure encourages 'undesirables' to congregate. Residents said that their children go outside more often now that they have their own garden and it was a place to sit and relax. Some residents like to have a choice about when and how they interact with their neighbours, others enjoy the social possibilities of the shared space. Petticrew (2009) concluded that a mixture of individual and shared outdoor spaces gives residents flexibility in terms of their relations with their neighbours.

2.4.1 The meaning of privacy

The term residential outdoor space implies that this is private space, though in practice this is not always so. The word *private* has a range of meanings (Oxford English Dictionary 2010). In terms of land it can be used to refer to ownership or usage rights or simply mean secluded. The meaning used in this thesis is:

- i. 'Restricted to or for the use or enjoyment of one particular person or group of people; not open to the public.'

The 'particular people' in this case are the residents of the dwelling or dwellings that have the right to use the ROS, and their guests.

The term *private* also has the meaning:

- ii. 'Concerning, involving, or affecting a particular person or group of people apart from the general community; individual or personal, rather than communal or shared.'

This reference to 'individual and personal' implies some degree of *privacy*, in the sense of:

- iii. 'The state or condition of being alone, undisturbed, or free from public attention, as a matter of choice or right; seclusion; freedom from interference or intrusion.'

Privacy is a key concern of residents (Cooper Marcus and Sarkissian, 1986) and is therefore of importance in this research, but the term *private* is used only in terms of rights of access and use, as in definition i. above. So a 'private balcony', for example' might be 'individual' or 'shared'.

This is a narrow definition of *private* and ignores all the nuances from definitely private to obviously public through grades of semi-private and semi-public (Altman, 1976; Madanipour, 2003). For example, how private the back garden of a single dwelling feels depends on factors such as type of boundary, what is beyond the boundary and how overlooked the garden is. Some authors refer to a single dwelling's front garden as semi-public and the hall and reception rooms as semi-private, as compared with the 'private' bedrooms (Madanipour, 2003). Front gardens can often be viewed from the street and provide access to the door of the dwelling which, unless entry is by a controlled gate, is not under the control of the resident(s). The front garden can be seen as a transition space from the private space inside the dwelling to the public space of the street and hence as a buffer between the private and public realms (Lawrence, 1981). Lawrence found that the attempt by architects and planners to create a useful social space by replacing individual front gardens with a grassy open space largely failed. In the typical 1970s housing development that he studied, the residents have little opportunity to personalise the area around their front doors.

The result is that residents withdraw behind those doors and, apart from children playing outside, only use the space for access (Lawrence, 1981). In this research front gardens are considered as *private* spaces which may not afford much *privacy*. Open plan front gardens and shared courtyards are also considered to be *private* in this study if they are designed for the sole use of residents, even though they may be used by other people and offer no *privacy* because their boundaries are ill-defined. These are examples of 'confused' or 'contested spaces' (Coleman, 1984; Schmelzkopf, 1995). Other confused spaces may have no clear ownership and no one responsible for them.

2.5 Aims of this research

The aim of this research is to find out if shared residential outdoor space meets the needs of the residents who have access to it and how shared residential outdoor space can be designed to maximise the amount that residents use it. In order to fulfil this aim the following research questions are investigated:

- What are the differences between the ways that residents with individual and those with shared, private residential outdoor space use their space and how do these compare with those who have access to both?
- Do residents of housing developments in which only shared, private residential outdoor space is provided, use that space in the way that they would like?
- What factors influence the way in which residents use their shared, private residential outdoor space?
- Are there benefits for those with shared residential outdoor space in having access to some individual private residential outdoor space as well?
- How can shared residential outdoor spaces be designed to enable all residents to gain maximum benefit from them?

2.5.1 How people use their residential outdoor space

The literature reviewed in this chapter indicates a range of activities that residents may do in their ROS. The key use of gardens identified by Bhatti and Church, (1999) and Pettigrew (2009) is as a place to sit and relax. Other leisure activities include entertaining visitors, contact with nature (Cammack *et al.*, 2011) and eating outside. More practical activities include drying washing, gardening and growing food (Bhatti and Church, 1999). Gardens are also useful as secure play space for children and may be used to exercise in and for the keeping of pets (Cooper Marcus, 1975; Petticrew, 2009).

2.5.2 Factors which may influence how much residents use shared ROS

Investigations of public outdoor spaces as well as residential outdoor space indicate some of the factors that may influence how much residents use their shared ROS.

Firstly, there are the attributes of the space itself: the layout, size, greenness, presence of trees and shrubs and attractiveness (Bhatti and Church, 1999; Cooper Marcus, 1975; Cooper Marcus and Sarkissian, 1986; Kaplan, 1973; Pettigrew, 2009).

Secondly, the relationship between the dwellings and the outdoor space, which defines how enclosed it is, how overlooked and how easy the access to it is. This is characterised by the age and height of the dwellings.

Thirdly, residents themselves have different needs and wishes. Research on preferences and behaviour in public outdoor spaces suggests that gender, age, health, ethnicity, employment status and socio-economic group of the

resident and the members of their household all influence what people wish to do when outdoors. (Burgess *et al.*, 1988; Hutchison, 1987; Kaplan and Talbot, 1988; Özgüner, 2011; Richardson and Mitchell, 2010; Roovers *et al.*, 2002; Worpole and Greenhalgh, 1995, cited by Woolley and Amin, 1999; Yang and Brown, 1992). Tenure and length of residence may also be influential.

Fourthly the characteristics and walkability of the surrounding area (Sugiyama and Ward Thompson, 2007), particularly the presence of high quality, near-by public space may influence how much residents use their private outdoor space.

This research aims to measure how much residents use their ROS, what they do there and what factors influence this. The indicators and categories for these variables are described in Chapter 3 and listed in Tables 3.1 to 3.6. The chosen methodology is then described.

CHAPTER 3 METHODOLOGY

You can never empirically or logically determine the best approach. This can only be done by considering a situation to be studied and your own opinion of life. (Arbnor and Bjerke, 1997, p 5, quoted in Blaxter *et al.*, 2001, p. 59)

3.1 Introduction

This chapter explains the approach taken to answering the research questions defined in Chapter 2. Section 3.2 describes the philosophical basis of the research. In Section 3.3 the variables to be investigated are derived. The approach to studying these variables is described in Section 3.4. The details of how data was collected and analysed are given in Chapter 4.

3.2 Philosophical basis

The philosophical foundations to the choice of research approach are phenomenological in assuming that every individual person has their own view or perception of the world. This is coloured by numerous influences, including culture, location, race, gender, education, family and experience of life (Diamond and Amso, 2008; Ambady and Bharucha, 2009). These individual perceptions of the world are not the same as 'reality' and therefore individuals, including the researcher, do not know what 'reality' is. The approach is based, however, on the assumption that there is a 'reality' about which we can gather data, but the data will be subjective because of the interpretation of both the researcher and the subjects of the research. Individuals and researchers can come closer to knowing this

'reality' by being as aware as the conscious mind can be of the limitations and biases of their own perspective (Bargh and Morsella, 2008) and by recognising that everyone else has their own individual perspective. This is in line with Giorgio's discussion of validity in qualitative research in which he refers to Willard's (1995) and Mckenna's (1982) interpretations of Husserl's philosophy of knowledge, which Willard describes as the mind's capacity to validly grasp reality (Giorgio, 2002).

Onwuegbuzie and Leech (2005) contend that the 'paradigm wars' between positivists and interpretivists have led to a false dichotomy between quantitative and qualitative research methods (Newman and Benz, 1998, cited by Onwuegbuzie and Leech, 2005). They describe three major schools: purists, who see the two paradigms as incompatible, adhere to one of them only and believe that quantitative and qualitative methods should never be mixed; situationalists, who agree that the methods should not be mixed, but think that either can be used depending on the research question; and pragmatists, who believe that researchers should profit from the strengths of both approaches in any one study. They go on to outline the misconceptions held by purists and situationalists, noting that the objectivity claimed by purist positivists is inevitably made subjective in the process of framing research questions, deciding on the sample and designing the research instruments and by the inconsistencies in the way that people interpret and answer questions. They and others (for example, Lietz, 2010; Seale, 2002; Vogt, 2006) urge that researchers should focus on the similarities of their approaches and not on the differences. Seale (2002) suggests that research is a craft and that researchers need to be aware of the impact of different methodological approaches and the consequences of

their methodological decisions. The key to producing good quality research is understanding the limitations of the methodology and mitigating them, for example by triangulation, audit or checking the interpretation of the data with the participants. This pragmatic approach is taken in this research.

3.3 Derivation of the indicators

The first task of this research is to discover if there is any difference between the way in which people who only have access to shared residential outdoor space, use that space, compared to those who have access to some individual private, residential outdoor space. The second task is to find what factors are associated with any differences in usage. These are the factors that influence what an environment offers, which, as discussed in Section 2.2.2.2, Gibson (1979, p.127) describes as 'affordances'. The affordances provided to a person by their residential outdoor space are unique to that person, as they are the elements that enable (or not) that particular resident to have a positive, active relationship with that space.

In order to determine the levels of usage of different types of residential outdoor space, three different situations are investigated. These are where:

- residents have access to shared, private residential outdoor space only (SROS).
- residents have access to shared and to some individual, private residential outdoor space (ISROS)
- residents have access to individual, private residential outdoor space only (IROS)

3.3.1 Measurement of usage of residential outdoor space

Two aspects of usage are considered in this research:

- How often does a resident go into their residential outdoor space (ROS)?
The aim is to differentiate between residents who use their outdoor space regularly and those who use it rarely or never. It is therefore not necessary to have a detailed measure of minute-by-minute activity in the space. A frequency scale running from daily to never is discriminating enough.
- What activities do residents engage in when in their residential outdoor space?

The amount of time people spend in their outdoor space is not included because it is strongly influenced by how much time is available, which is heavily dependent on factors such as employment status and is therefore less indicative of the affordances offered by the outdoor space than frequency is.

A list of common activities that people engage in, when in their private, residential outdoor space, was generated from consideration of the literature on the use and meanings of domestic gardens (Bhatti and Church, 2004; Smith *et al.*, 2005) and discussions with colleagues. These ranged from purely practical activities, such as hanging washing out, to leisure and social activities such as sitting and relaxing or entertaining visitors. The activities investigated in this research are listed below in alphabetical order:

As an access route
For children's play
Eating outside
Entertaining visitors
Exercising
Feeding and enjoying wildlife
Gardening
Growing food
Hanging washing out
Keeping pets
Maintaining a car
Sitting and relaxing
Talking to neighbours

3.3.2 Factors influencing usage

As discussed in Sections 2.3 and 2.4 the factors that may influence levels of usage of residential outdoor space are:

- 1 Attributes of the dwelling and the development
 - dwelling type
 - tenure
 - number of storeys and storey of dwelling
 - age of the development
 - layout of the residential outdoor space
 - number of dwellings sharing the residential outdoor space
 - area of outdoor space per dwelling
 - greenness
 - tree cover
 - boundary and amount of enclosure
 - inequality of provision of residential outdoor space
 - perceived attractiveness
 - noise
 - air quality

- 2 Attributes of the immediate local area
 - settlement size
 - residential location
 - distance to facilities and public outdoor spaces

- 3 Attributes of the resident and the members of their household
 - demographic variables
 - household composition
 - length of residence and tenure
 - responsibility for the residential outdoor space
 - relationship with the residential outdoor space
 - relationships with neighbours and other residents sharing the space

The indicators for these attributes are discussed in Sections 3.3.2.1 to 3.3.2.4.

3.3.2.1 Attributes of private, residential outdoor space

3.3.2.1.1 Hard design features

These are the features of private, residential outdoor space that are ‘designed in’ and difficult or less likely to change after the development has been built.

The key features of interest are the relationship between the outdoor space and the dwellings, the amount of space available per dwelling, whether that space is for the use of individual households or shared and if shared, by how many households. Some of these features require measurements to be made on the ground or on maps. The indicators devised to measure them are listed in Table 3.1. A typology of layout showing the physical relationship between the building(s) and the residential outdoor space was devised in conjunction with the I'DGO TOO team. This is shown in Figure 3.1. and some examples are given in Figure 3.2 a.) to d.).

Table 3.1 Indicators to measure hard design features

Feature	Indicator	Measures or Categories
Relationship of outdoor space to buildings containing dwellings	Layout typology	See typology in Figure 3.1.
	Type of outdoor space	Front garden Back garden Patio, terrace or veranda Yard (paved area) Balcony Courtyard Other
Individual or shared residential outdoor space		Individual only (IROS) Mixed (some individual, some shared) (ISROS) Shared only (SROS)
Amount of outdoor space available per dwelling	Area of outdoor space per dwelling	Measured area (square metres) Number of dwellings sharing the SROS
Number of households sharing the SROS		Number of dwellings sharing the SROS

Figure 3.1 Typology of residential outdoor space layout

Key

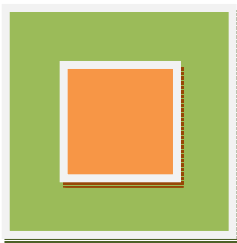
Residential outdoor space



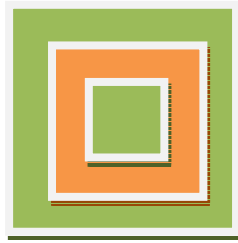
Building containing dwelling(s)



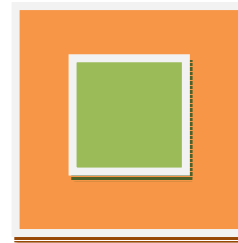
1. Surrounding



2. Surrounding & fully enclosed



3. Fully enclosed



4. To the rear



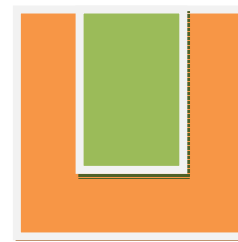
5. To the front



6. Enclosed 2 sides



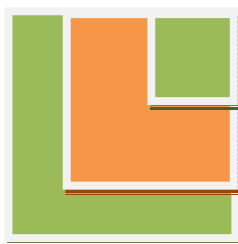
7. Enclosed 3 sides



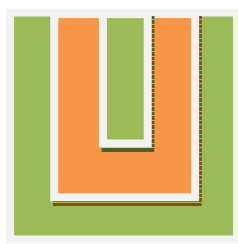
8. To rear & front



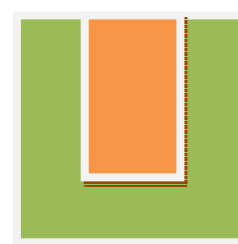
9. Surrounding & enclosed 2 sides



10. Surrounding & enclosed 3 sides



11. Surrounding 3 sides

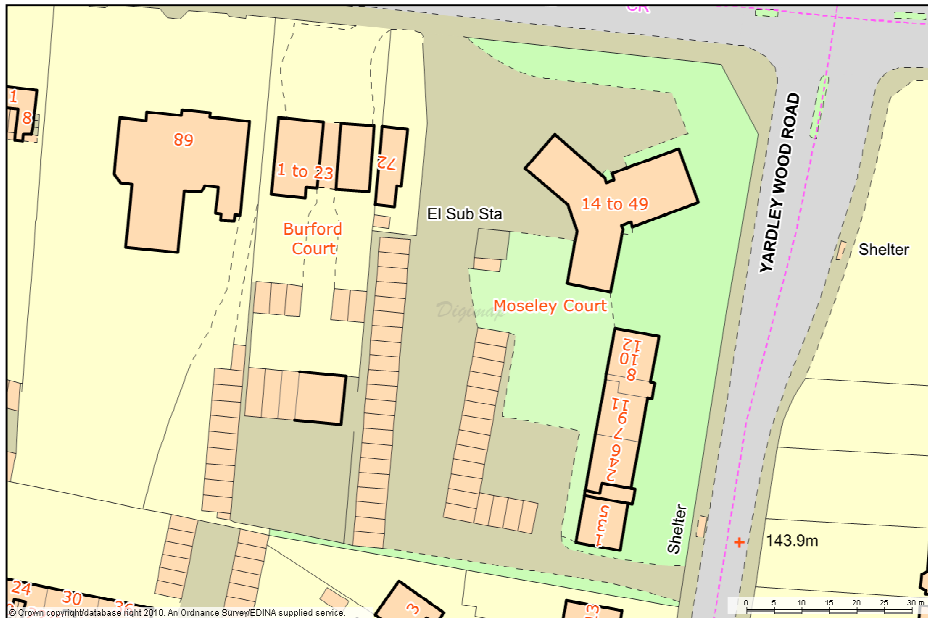


12. Linked courtyards

13. Other

Figure 3.2 Examples of ROS layout type (maps from Digimap, photographs from www.bing.com)

- a.) Two examples of Type 1. – Surrounding. Burford Court has far less space at the sides than Moseley Court but enough to link the front and rear ROS. This is not clear in the aerial photograph.

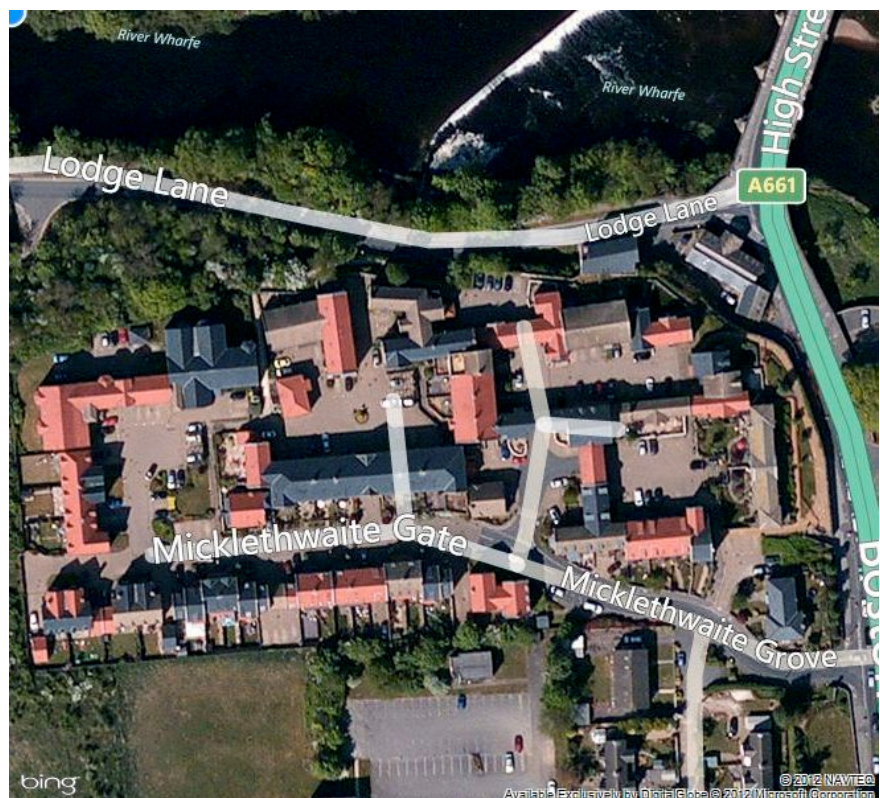


- b.) These Glasgow tenements have enclosed shared gardens. The one between Sword Street and Thomson Street is Type 3 – Fully enclosed.

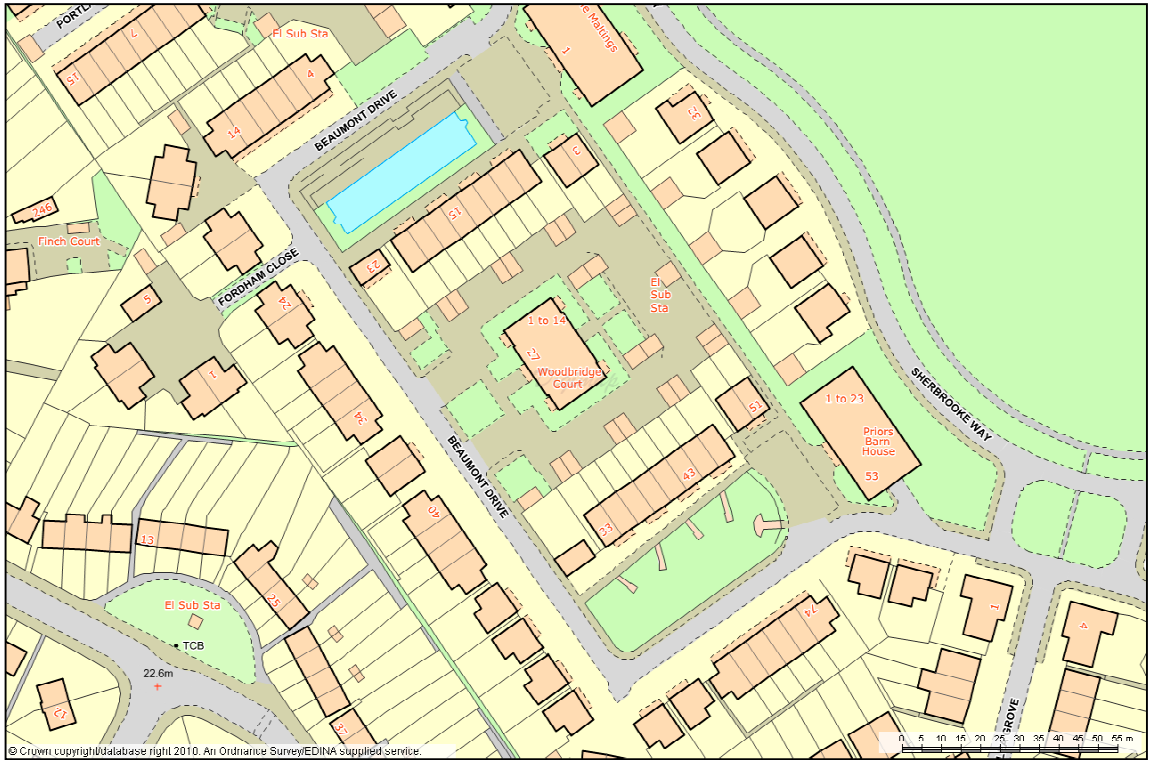


The one between Thomson Street and Bellfield Street is Type 7 – Enclosed 3 sides, because it has an entrance on the south side, which enables some of the space to be used for parking and allows non-residents to enter the space.

- c.) This is a typical post-2000 development with Type 12 – Linked courtyards



- d.) This estate displays several different typologies, so responses from here were coded according to their individual situations. Typologies shown here include 1 – Surrounding, 4 – To the rear and 8 –To the rear and front



3.3.2.1.2 Semi-permanent features

As discussed in Section 2.3, research on usage of public outdoor spaces, such as plazas and parks, shows that semi-permanent features such as mature trees and how green a space is, influence preference (Sullivan & Lovell, 2006; Kuo *et al.*, 1996) and how the space is used (Bell *et al.*, 2006; Coley, *et al.*, 1997; Gold, 1977; Kaplan and Kaplan, 1989). These features are of particular interest in this research because they can only be changed with some effort and expense.

Table 3.2 lists these semi-permanent features and their indicators.

Table 3.2 Indicators to measure semi-permanent features

Feature	Indicator	Measures or Categories
Greenness	Proportion of the outdoor space that is grass and planting	None Less than a fifth One to two fifths Around half Three to four fifths Over four fifths
Mature trees (diameter of trunk at breast height (dbh) ≥ 200 cm (Volder <i>et al.</i> , 2009))	Number of mature trees	None Sparse Moderate Thick Mainly on boundary
Parking provision	Number of off-road parking spaces per dwelling	None Less than 1 per dwelling 1 per dwelling More than 1 per dwelling
	Number of garages per dwelling	None Less than 1 per dwelling 1 per dwelling More than 1 per dwelling
Boundaries	Enclosure	Percentage of fixed physical boundary on the perimeter
Outbuildings	Shed / greenhouse	Present / Not present

Type of boundary, hard standing for cars, sheds, greenhouses, garages and patios also come into this category of semi-permanent features, which may

influence what residents do in their outdoor space. Sheds, greenhouses and garages are not strictly outdoors, but are considered here as features of the outdoor space that support activities in the outdoor space. Parking is not an activity considered in Section 3.3.1 above, because it is passive, as any storage is. Being able to park off the street or in a garage is, however, a use of residential outdoor space and is an important benefit to those residents who own cars. It is therefore included as an element which influences satisfaction.

3.3.2.1.3 Perceived attractiveness

Though attractiveness is a subjective feature, there are attributes that can enhance or detract from it. People's sensitivity to these attributes is variable, but they are still indicators of general attractiveness. Studies of usage of public outdoor spaces show that good maintenance is a major consideration when deciding whether to use a space (Bell *et al.*, 2006; Hayward and Weitzer 1984; Kuo *et al.*, 1996; Shaffer and Anderson, 1985). Even natural spaces are judged on maintenance as many visitors prefer spaces with well maintained paths, good signage and lack of litter (Özgüner and Kendle, 2006; Ward Thompson *et al.*, 2005). Accessibility, air quality and noise levels also influence how attractive a space is and the probability that it will be used. Table 3.3 lists these attributes and their indicators. Other components of attractiveness, such as detailed design and decorative planting, are not included in this study because these are highly variable elements that can be changed more easily to suit residents' requirements.

Table 3.3 Indicators for attributes that relate to attractiveness

Feature	Indicator	Measures or Categories
Accessibility	Distance to outdoor space	Lowest floor of living accommodation of dwelling
Air Quality	Quality of air noticed by residents	Noticeably poor and unpleasant Not noticed
Noise	Levels of unpleasant external noise	Quiet and peaceful Some low level noise (distant hum of traffic) Noticeable noise (occasional aircraft) Intrusive, unpleasant noise (constant, close traffic noise; loud music, frequent shouting, frequent, low aircraft)
Maintenance	Level of maintenance	Well maintained Moderately well maintained Untidy Neglected

3.3.2.2 Attributes of the resident and members of their household

Studies in public outdoor spaces show that different people use the same space in different ways (Field, 200; Chiesura, 2004; Ward Thompson *et al.*, 2005; Matzuoka and Kaplan, 2008; Goličnik and Ward Thompson, 2010; Ozgüner, 2011). This is because a complex mixture of factors influences how a person perceives an environment and its affordances at any one time. As well as the attributes of the environment the personal attributes of the person are important factors. Research on preferences and behaviour in public outdoor spaces suggests that gender, age, health, ethnicity, employment status and socio-economic group of the resident and the members of their household may all influence what they wish to do in their residential outdoor space and what they feel able to do in it (Burgess *et al.*, 1988; Hutchison, 1987; Kaplan and Talbot,

1988; Ozgüner, 2011; Richardson and Mitchell, 2010; Roovers *et al.*, 2002; Worpole and Greenhalgh, 1995, cited by Woolley and Amin, 1999; Yang and Brown, 1992). There have been fewer studies of what people do in their own gardens, but these also show variations with age, social class and tenure (Bhatti and Church, 2004). The personal attributes investigated in this research are listed in Table 3.4. Most of the definitions used are compatible with those from the 2001 Census, so that the data from this research may be used in comparative investigations at a future date.

Table 3.4 Indicators for attributes of residents

Feature	Indicator	Measures or Categories
Age	Year of birth	Year
Gender	Gender	Male Female
Ethnicity	Ethnic group	White Black/Black British Asian/Asian British Mixed Chinese Other
Health	Self-rated general health	Very good Good Fair Poor Very poor
Employment status	Economic status	Paid employed/self employed Unemployed/seeking work Retired Looking after family/home Full time student Long term sick/disabled Other
Socio-economic group	Type of work	Professional/semi-professional Manual
Household composition	Adults in household	Number of adults
	Children in household	Number of children
	Visiting children	Number of children

Table 3.4 continued		
Feature	Indicator	Measures or Categories
Responsibility for ROS	Length of residence in current home	Number of months
	Tenure	Own outright or with mortgage/loan Part rent/ part mortgage Rent from a housing Association or Council Rent from private landlord
	Able to make changes	Strongly agree Agree Neither agree/disagree Disagree Strongly disagree
Relationship to residential outdoor space	Satisfaction with residential outdoor space	Very satisfied Fairly satisfied Neither satisfied nor dissatisfied Fairly dissatisfied Very dissatisfied
		What resident likes What resident would like to change
	Outdoor space is very important	Strongly agree Agree Neither agree/disagree Disagree Strongly disagree
	Ideal uses of residential outdoor space	Activities in section 3.2.1& An attractive environment Enhanced image of home Space for parking Space for storage
	Barriers to using your ROS	Lack of privacy Fear of falling The effort involved
Relationships with neighbours and other users	Barriers to using your ROS	Behaviour of neighbours Fear of attack
	Perception of community spirit	Community spirit is: Very strong, Fairly strong, Not very strong, Not at all strong

These are attributes that can only be known by asking residents directly in a questionnaire or interview.

3.3.2.3 Attributes of the dwelling and the development

The definition of a dwelling used in this research is that used by the Valuation Office Agency (VOA) and the Department for Communities and Local Government (DCLG). They define a dwelling as accommodation normally lived in by one or more households. Flats are each counted as separate dwellings and temporary structures such as houseboats or caravans are included if they are the sole or main residence of a household. Premises that are partly domestic and partly non-domestic are also included. A dwelling is defined in terms of ownership, occupation and liability for Council Tax. For example a terraced house divided into 3 bedsits may be considered as 3 dwellings if they each have their own self-contained bathroom and share a kitchen, but as 1 dwelling if they share washing and toilet facilities. The full definition of a dwelling is found in Section 3 of the Local Government Finance Act 1992. This definition is used in this research because it is closer to the number of households than the definition used for the 2001 (and 2011) Census.

Dwellings of a particular type and age tend to have typical amounts of outdoor space and typical relationships between the space and the building(s) (Kellett, 1982; Loram *et al.*, 2008; Swenarton, 1981). These differences influence the affordances of the space and how residents are able to use it. The importance of the view of the outdoors from the dwelling was established in Section 2.3. Providing an attractive view is another function of residential outdoor space and for some residents may be its chief use. Table 3.5 gives the indicators for the attributes of the dwelling and the development.

Table 3.5 Indicators for attributes of the dwelling and the development

Feature	Indicator	Measures or Categories
Type of dwelling	Form	Detached house or bungalow Semi-detached house or bungalow Terraced house or bungalow Flat, maisonette or tenement
Age of dwelling	Era	2000 + (Urban renaissance) 1980 - 1999 (Postmodern) 1960 - 1979 (Modern) 1946 - 1959 (Post WW2) 1919 - 1945 (Inter-war & WW2) 1901 - 1918 (Edwardian & WW1) 1837 - 1900 (Victorian) Pre-1837 (Pre-Victorian)
View from the dwelling	Main content of view	Garden Street Neighbouring buildings Maintained greenspace Woodland or wild space Countryside Off-street parking space Space for waste bins
	Greenness of view	Very green Fairly green Not very green Not at all green
	Number of trees in view	None Less than 10 Between 10 and 50 More than 50
Height of buildings	Maximum number of floors	Number of floors of tallest residential part of the development

3.3.2.4 Attributes of the immediate local area

The level of usage of residential outdoor space may be influenced by the environment and amenities in the immediate vicinity, particularly provision and quality of public outdoor space (Humpel *et al.*, 2004). To enable comparisons to be made between the use of residential outdoor space in cities and less built up suburbs and small towns, information is required about the settlement and the area surrounding the dwelling. The type of residential location is also

characterised by proximity to food shops, as large residential estates often have no nearby shops. Table 3.6 summarises the data collected about the local area.

Table 3.6 Attributes of the immediate local area

Feature	Indicator	Measures or Categories
Residential location	Settlement size	City/large town Small/medium town Large village/small town Small village
	Proximity to shops (300m (English Nature 2003) measured as a walkable route, not a radius)	Shops within 300m Shops further than 300m Shops further than 300m & site on settlement edge
Access to public space	Access to different types of public open space within 300m (measured as a walkable route, not a radius)	Park/playground Recreation ground/ playing field Public square, plaza or village green Nature reserve, countryside or common River or canal towpath Beach or coastline No public open space except roads
Inequality	Type of inequality	Even share of outside space A few dwellings with a greater share A few dwellings with a lesser share Mixed range of share of outside space per dwelling
Degree of inequality	Degree of inequality	Ratio of inequality is about 1 : 2 Ratio of inequality is about 1 : 4 Ratio of inequality is 1: 5 or more Even share of outside space

3.4 Research approach

3.4.1 A question of scale

Section 3.3 defines a large number of factors that may be associated with variations in the levels of usage of residential outdoor spaces. The features of the outdoor space which are of particular interest, such as the layout in relation to the residential buildings, the area per dwelling and the number of households sharing the space, show a wide variation. To assess the impact of such highly variable factors a large number of study sites with different characteristics was

selected. The advantage of selecting a large number of sites for their different features is that they can also be selected to give variation in other features such as residential location. The large sample should also provide variation in the attributes of the residents. Resource and time constraints limited the methods that could be used to study the resulting sample. A pragmatic mixed approach was therefore taken. A large number of sites was explored using a written postal questionnaire and a small number was investigated in more detail by surveying the site and conducting interviews. The advantages and disadvantages of the methods used are discussed in the rest of this section.

3.4.2 Design of the study

The need for a large number of sites in order to cover the high degree of variation described in the previous section, limits the amount of finite resources that can be expended on gathering data from each site. Time is the greatest constraint. The study is therefore a cross-sectional one that takes a 'snapshot' in time and relies on selecting a sample that includes all the variation required in both the outdoor space and the residents. This large sample was only made possible through the researcher's involvement in the I'DGO TOO project. This enabled a larger sample to be studied than would have been possible alone. Care was taken in defining a sample with all the variability required.

The use of a longitudinal study was excluded because changes in residents' usage of their residential outdoor space are likely to be linked to changes in the space or major life changes, such as having a child, retiring or losing their job. To capture such changes, a longitudinal study would have to be done over

several years, which is not possible due to time constraints. A longitudinal study would also be flawed because the sample would become increasingly skewed over time. This would be caused by the greater rates of internal migration by people aged 20 to 29 years compared to other age groups (Migration Statistics, 2008). Migration of younger people is particularly high in the private rented sector, where leases are often short term (Clark and Onaka, 1983; Feijten and Mulder, 2002; de Groot *et al.*, 2011; Kritz and Gurak, 2001; Lee *et al.*, 1994): so this segment of the sample would dwindle more rapidly than others over time.

The use of a natural experiment where a residential, outdoor space was about to be overhauled or its management changed in some way was excluded because only a small number of the variables of interest would change. The hard design features, in particular, would usually be unchanged and these are of particular interest in this research.

3.4.3 Selection of data collection methods

3.4.3.1 Survey of sites

The task of collecting data about the features of a large number of sites is too big to be accomplished by one researcher doing physical surveys in the time available. Desk-based methods were therefore used. These also make it easier to be consistent in the measurements taken and enable measurement to be done without physical barriers impeding sight lines. The accuracy of these measurements is discussed in Section 4.2. The map tool chosen for this desk based survey was the Carto product from the Digimap Ordnance Survey collection (Digital map data).

It was used both in the selection stage and the data gathering stage to check layouts and locations. It was also used to measure the area of each development so that the area of outdoor space available per dwelling could be assessed.

Digimap (©Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.) is one of the EDINA (Edinburgh Data and Information Access) services funded by the Joint Information Systems Committee (JISC) and hosted by the University of Edinburgh. Data are provided from the Ordnance Survey MasterMap® Topography Layer, which covers all of Great Britain. The OS MasterMap® Topography Layer contains over 450 million features that represent physical objects, such as buildings, fields, fences and intangible objects such as county boundaries. In urban areas (major towns and cities) the scale is 1:1,250, in rural areas 1:2,500 and on moorland 1:10,000. Major changes, such as large housing developments or major road construction are updated on the OS MasterMap® Topography Layer through a process of continuous revision using both ground and aerial survey techniques. Changes are captured within six months of building completion or demolition (Digimap, 2011). Carto is therefore a tool with high reliability and has the benefit of being simple to use, thus reducing human error.

At the beginning of this research aerial views of many areas of Great Britain were available via the internet although the quality was variable. Birds-eye views, which are often much clearer and enable easier identification, became increasingly available over the duration of the research. It therefore became apparent that the tree cover, greenness and boundaries of the outdoor space

could be assessed for a large number of different sites using this technology. Most of these visual assessments were made using www.bing.com because, at the time, high quality birds-eye view was more widely available on this website than on Google Earth (www.maps.google.co.uk). The amount of off-street parking, the maximum number of storeys and the era of buildings were also assessed using birds-eye view and Google streetview accessed via www.rightmove.co.uk. Use of these visual resources also enabled Carto map data to be checked where its meaning was ambiguous (for example where the position of a boundary was unclear).

3.4.3.2 Gathering data on residents' usage

Experiments in psychology and behavioural science suggest that there is often a difference between what people say they do and what they actually do (Foddy, 1993; Hardman and Stensel, 2009). This suggests that observing residents' behaviour might be a better method than asking them about it. Direct observation is a key method for landscape architects investigating usage of public open spaces (Cooper Marcus and Francis, 1988; Ward Thompson *et al.*, 2005). In public places, especially in a city, where most people are strangers to each other (Jacobs, 1961), researchers can remain unobtrusive. This method is not, however, suitable for private residential outdoor spaces, where researchers are noticeable and their presence may cause changes in people's behaviour (for example, coming outside ostensibly to do something else in order to find out who the researcher is). The solution to this would be covert observation, but this was rejected on ethical grounds, as people should be safe from this in their own private space.

The method chosen as most likely to be effective and efficient in terms of resource use was to ask residents about their usage through a postal self-completed written questionnaire. The advantages and pitfalls of this method are discussed below. To triangulate the findings from the questionnaire, semi-structured interviews were conducted in a small sample of cases where the outdoor spaces were surveyed in detail. This allowed some direct observation, informal conversations and map work to enrich and validate the findings from the questionnaire.

3.4.3.2.1 Advantages and disadvantages of the self-completed written questionnaire

Self-completed written questionnaires are used extensively in academic and market research and can be used at a wide range of scales, from post-occupancy feedback from residents of a development, to national surveys such as the General Household Survey and the Census. Using the written questionnaire rather than the face-to-face interview, data can be gathered from a large number of people spread over a wide geographic area, enabling a broad range of variables to be explored. Every member of this large sample is offered the same questions, presented in the same format and order. In interviews, the behaviour of the interviewer may affect the response of the interviewee (Gray, 2004), but this source of uncertainty is eliminated using a written questionnaire. The input of the researcher in terms of question design, format, additional information, design and layout is exactly the same for all members of the sample. For these reasons this was the method used to gather the bulk of the data about residents and their usage of their residential outdoor space.

3.4.3.2.2 Questionnaire administration

The questionnaire was delivered to the selected sample of residents by post. This is despite the advantage of the more personal method of 'drop and collect' in consistently providing a higher response rate, particularly for long, complex questionnaires (Lovelock *et al.*, 1976; Gray, 2004; Blaxter *et al.*, 2001). Postal delivery was used because it allowed data to be gathered from a large sample from areas in different parts of Great Britain. It is also the least intrusive to people in the sample, as they can fill it in whenever they have a few spare minutes (Gray, 2004) and can decide not to engage without any embarrassment. The use of the internet to deliver the questionnaire was rejected because this would eliminate data from those residents who are not comfortable using the internet or do not have access to a computer.

3.4.3.2.3 Validity of questionnaire responses

The validity of questionnaire responses is highly dependent on the design of the questionnaire. Changes in responses can be caused by small differences in the wording of questions, (Peterson, 1984 cited by Foddy, 1993), the answers to earlier questions, the order of response options, and the format of questions (Blaxter *et al.*, 2001; Dunn, 2010; Foddy, 1993, Gray, 2004). The design of the questionnaire for this research is discussed in Chapter 4, Section 4.3.1.

3.4.3.2.3.1 Accuracy of answers

Accurate reporting of an activity has been shown to depend on recency, intensity (i.e. the emotional impact of the activity) and question design (Pascale *et al.*, 2009). Self-reporting can also have a bias based on social desirability, for

example under-reporting of activities that impair health, such as cigarette smoking (Gallus *et al.*, 2011) or over-reporting of time spent watching the news (Prior, 2009). In this research people may feel guilty that they do not use their outdoor space more, or angry about the unsuitability of the space or about the behaviour of other residents. These emotions may influence the answers that they give.

In asking a question about behaviour, such as 'How many times did you go into your garden in the past week?', the researcher is asking the respondent to engage in a complex cognitive process. Schwarz *et al.* (2001, p. 129) describe the stages of this process as:

Step 1: Understanding the question

Step 2: Recalling relevant behavior

Step 3: Inference and estimation

Step 4: Mapping the answer onto the response format

Step 5: 'Editing' the answer for reasons of social desirability

The researcher assumes that people know what they do, can report this accurately and are prepared to be candid about it. There are opportunities at each of these stages for error. Respondents may interpret the question in a way not intended by the researcher, because of ambiguous wording, assumptions about what the researcher is interested in or the context. Their recall, particularly of everyday behaviours which are not stored in memory as individual events, may be inaccurate and incomplete and this can be exacerbated if they are not allowed enough time to search their memory. Research suggests that

the recall of individual behavioural episodes is limited to unusual behaviours of considerable importance (Conway, 1990; Strube, 1987, cited by Schwarz, 2001). Where recall is incomplete respondents fill in the gaps by estimating their activity during the reference period. Experiments show that the more frequent a behaviour is, the greater the underestimate of its frequency, while the frequency of unusual events tends to be over-estimated (Thompson and Mingay, 1991). People often estimate past behaviour by reference to their present behaviour and may be unaware of changes that have occurred over time. Having recalled what they can and estimated the rest, respondents then have to make their answer fit into the given response format - is weekly fairly frequent or very frequent? - and decide how honest an answer they want to give.

It is clear that the posing and answering of a question is a much more complex process than at first appears. For this reason the use of questionnaires and interviews in social research has been much criticised (Briggs, 1986; Cicourel, 1964; Phillips, 1971, all cited by Foddy, 1993). They are, however, convenient methods that are frequently used, so many critics have focused on how to improve their validity rather than undermining them. The key is to understand the limitations of these methods.

This research is trying to discriminate between residents who do things in their outdoor space several times a week, when the weather is reasonable, and those who rarely, or never, go into their residential outdoor space at all. Absolute accuracy of recall is therefore not required. It is not necessary to find out exactly when residents went into their outdoor space and precisely what

they did there, only roughly how often they use their space for different activities. The assumption is that residents' estimates of these things are accurate enough to answer the research questions. The self-completed questionnaire is filled in at a time that suits the respondent without the pressure of a researcher being present, so they can take as long as they like to make their estimates, which should improve their accuracy (Schwarz, 2001). This is another benefit of using this method to gather data rather than face-to-face interviews.

Some respondents try to answer in a way that they think will be helpful to the researcher, so how the question is formulated can influence the way it is answered (Schwarz and Oyserman, 2001). However objective the researcher tries to be, their questions will inevitably reflect their viewpoint (Gray, 2004, p.189). In this research, the researcher may have a belief that going outside is good for people and this may influence how questions are worded. Every effort was made to ask questions in a neutral way so that respondents were not led to particular answers.

Respondents are also influenced by the frequency scale that they are offered, placing themselves according to how they view their behaviour compared to that of the general population. They will assume that the middle of the scale represents the average or usual frequency for that behaviour (Schwarz and Scheuring, 1992, cited by Schwarz, 2001; Gaskell *et al.*, 1994). The scale chosen to investigate frequency of each activity in this research is discussed in Section 4.3.1.

There may also be a high non-response rate, which may skew the distribution of answers given. In this research, residents who are interested in their residential outdoor space are most likely to respond, so the proportion of residents who do not use their space is likely to be underestimated. The effect of a high non-response rate on this type of non-response bias is complex and will be different for each question. Groves (2006) reviews a number of studies in which estimates of non-response bias have been made. He concludes that variation of non-response bias is much higher within surveys (that is between different questions) than it is between surveys and that non-response rate on its own is a poor predictor of non-response bias (also Sturgis, 2008). Therefore, the researcher has to consider the impact of the non-response rate on responses to individual questions, that is, what relation might there be between the decision to respond or not and the answers given to the particular question? Improving the response rate may not reduce the bias, especially if the improvement is due to something that will mainly appeal to one segment of the population, such as a financial incentive (Groves, 2006). Recent studies suggest that sometimes improving the response rate reduces the quality of the data, as more reluctant responders take less care and are more likely to skip questions (Fricker and Tourangeau, 2010). For this reason no incentives were offered to respondents.

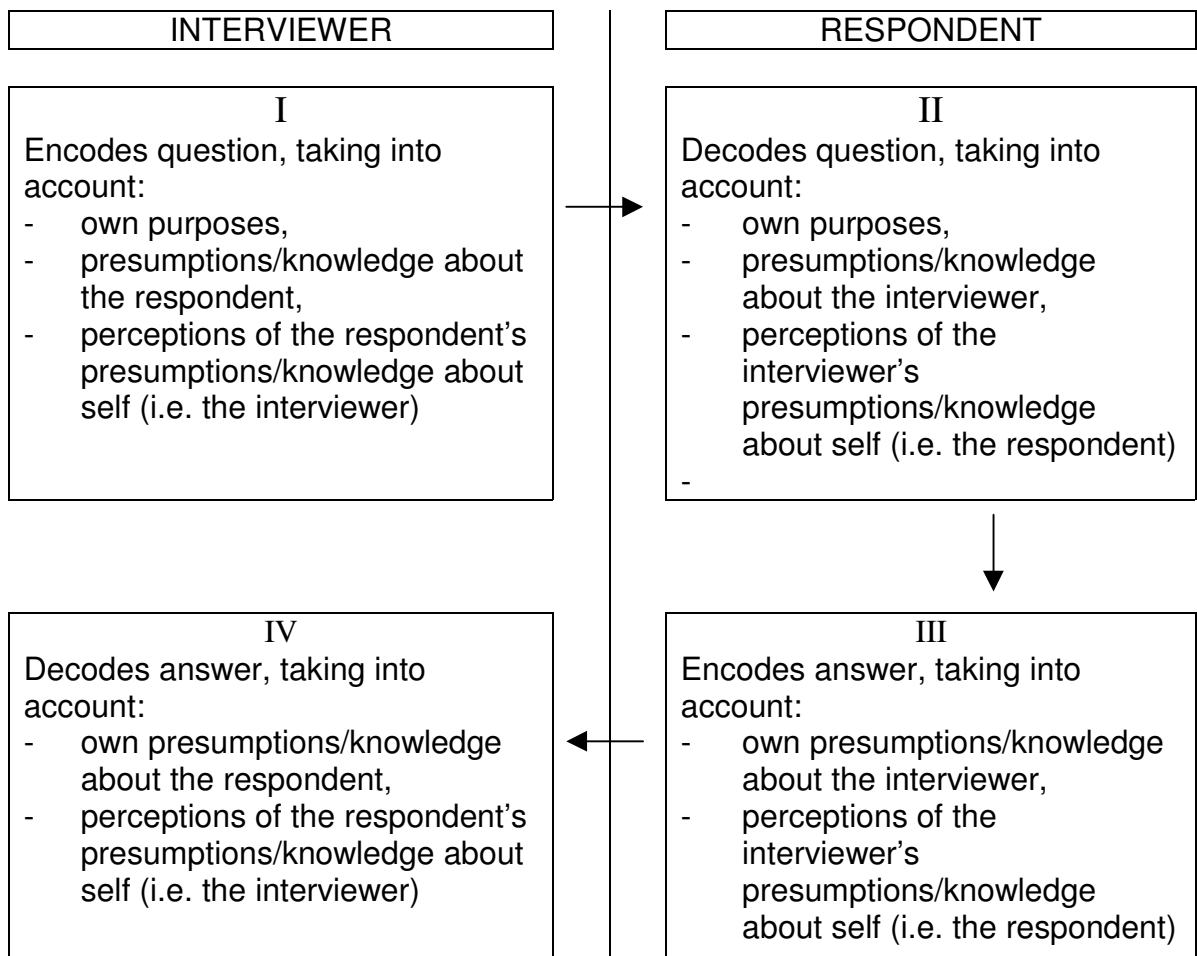
3.4.3.2.4 Interviews

An interview is essentially a conversation between people, one of whom has the role of researcher. Interviews allow the researcher to probe and gain understanding not only of people's behaviour, but also of the values, beliefs, perceptions and meanings that underpin the behaviour (Gray, 2004). If done

face-to-face (rather than on the telephone), the interviewer has the opportunity to record the body language, tone and emotional state of the respondent as well as the words said. The interview can therefore be used to build on and enrich the data gathered in a written survey, but its quality is highly dependent on the skill of the interviewer. The interview is a sociological interaction, and like any other is influenced by the external context, for example physical environment and social norms, and by the psychological state of the two protagonists and the way that they respond to each other (Phillips, 1971). However well trained the interviewer, unconscious signals will be different in each interview and respondents will react in their own unique way. Foddy (1993) describes what happens in an interview by applying the tenets of symbolic interactionism as summarised by Herbert Blumer (1965). These assume that human interactions are not just stimulus-response: they involve each person unconsciously interpreting the behaviour of others before reacting. Interpreting, planning and acting are continual, often unconscious, processes, which begin again for each participant at each stage of any social interaction.

Foddy offers the following model of what happens when a question is asked and then answered (Fig. 3.3).

Figure 3.3 A model of the symbolic interactionist view of question-answer behaviour (adapted from Foddy 1993, p. 22)



The interpretation of the question by the respondent is therefore influenced by their assumptions about what the interviewer's aims, needs and preferences are and by how they think that the interviewer views them, as well as by the wider context. The interviewer therefore has to be very clear about the aims of the research and why the question is being asked. The less respondents have to guess at for themselves, the more likely they are to give comparable answers. If more than one interviewer is used, these difficulties are compounded.

In this research interviews fulfil two functions. Firstly, comparison of the interviewee's answers to their written responses to the questionnaire enables the consistency of their answers to be assessed. This comparison is used to test the validity of the questionnaire. Secondly, the interview provides an opportunity to explore areas that were not covered in the questionnaire, particularly relationships with neighbours and other users of the space. Semi-structured interview technique was chosen as the most appropriate. This means that the interviewer uses the same framework of questions to open each topic at each interview and uses silence, affirmation or probing questions to elicit more information. The interviewer responds to each interviewee as an individual and recognises that interview data from different respondents may not be directly comparable.

The use of focus groups in some of the developments with shared ROS was considered, in order to increase the number of residents whose views were heard. This method was rejected because the aim of this research is to explore the behaviour of individuals, not the shared experience of residents. In an individual interview, residents are not influenced by the strong views of others in a group.

3.4.3.3 Gathering data about the surrounding area

Two sources of information were used to gather data about the surrounding area. The Carto tool of Digimap (©Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.) was used to measure the settlement size, the distance to the nearest shops and to the nearest public outdoor spaces and to assess any inequality of provision of ROS. Birds-eye view from www.bing.com was used to confirm the identity of shops and outdoor spaces.

3.4.3.3.1 Settlement size

Dictionary definitions of village, town and city are vaguely, but not precisely, related to size and tend to be rather circular. For example, the Concise Oxford English Dictionary (2008) provides the following definitions:

- Town:
1. a built-up area with a name, defined boundaries, and local government, that is larger than a village and generally smaller than a city.
 2. the central part of a town or city, with its business or shopping area.
 3. densely populated areas, especially as contrasted with the country or suburbs.
- City:
1. a large town, in particular a town created a city by charter and typically containing a cathedral.
- Village:
1. a group of houses situated in a rural area, larger than a hamlet and smaller than a town.
 2. a self-contained district or community within a town or city: *the Olympic village*.
- Hamlet:
- a small village, especially (in Britain) one without a church.
- Urban:
- relating to a town or city.
- Rural:
- in, relating to, or characteristic of the countryside rather than the town.

In the UK we do not have (as some countries do) a Place Names Authority, and the Ordnance Survey (OS) has become the naming authority by default. Since the early 19th Century OS surveyors have been responsible for collecting and authorising place names, using their local knowledge. If a settlement had a regular market and was known locally as the 'market town', for example, it would be shown as a town, even if it was no larger than some villages (Dalton, 2008). A settlement is recognised as a town not only by its size, but also by its function in the

surrounding area. These definitions are unrelated to physical size or population and have led to obvious anomalies, such as the village of Kidlington (population nearly 13,719 (Census 2001)), the town of Reading (population over 143,000 (Census 2001)) and the City of Ely (population around 15,000 (Census 2001)) (National Office for National Statistics, 2011, Neighbourhood Statistics website).

To avoid the ambiguity of these terms two measures were developed to characterise the context of each development. These were settlement size (area) and distance from the nearest shops.

A typology of settlements was developed based on their built up land area as shown in Table 3.6. These are:

- City or large town cannot be enclosed by a circle of 2 km radius (area greater than 12.6km²)
- Small to medium town cannot be enclosed by a circle of 1 km radius, but is fully enclosed by a 2km radius circle (allowing for shape) (area between 3.1-12.6km²)
- Large village or small town cannot be enclosed by a circle of 300m radius, but is fully enclosed by a 1km radius circle (allowing for shape) (an area between 0.3-3.1km²)
- Small village can be fully enclosed by a 300m radius circle (allowing for shape) (an area less than 0.3km²)

This typology ignores historical definitions and charters, each type being only defined by the built up land area. This means that villages which have had large residential estates built around them fall into the large village/smalltown category or even the small/medium town category. Isolated residential estates fall into the appropriate category according to their built up area, despite having

no town or village centre. Large towns such as Reading come into the same category as officially recognised cities.

3.4.4 Data analysis

Data on a large number of variables has been gathered from a diverse population, so the sample has high complexity. The application of statistical correlational techniques to such a complex database is problematic (Abell, 1971, cited by Cooper and Glaesser, 2008; Michelson, 1977; McPherson, 2001). Such methods assume that variables are independent (McPherson, 2001) which is rare in real life (Abbott, 2001, cited by Cooper and Glaesser, 2008) and clearly not so in this dataset. Statistical methods are based on linear algebra and simplify the data so that many variables are discounted because they are only significant for a small portion of the whole sample. They also ignore the possibility of multiple pathways to an outcome (Ragin, 1987). To avoid this loss of complexity (Cooper and Glaesser, 2008, 2010), fuzzy set techniques used in Qualitative Comparative Analysis (QCA) were applied to explore the relationships between different factors and their links to variations of usage of residential outdoor space. QCA was developed by Ragin (1987) from techniques which are well-established in the fields of circuit design and computer programming. These apply the mathematics of sets using the tools of Boolean algebra. Instead of focusing on variables the method considers cases and identifies sets of different cases with similar characteristics. Each returned, completed questionnaire is an individual case. For each set the probability of the outcome, for example, that a respondent uses their residential outdoor space at least once a week, is calculated. This allows identification of the combinations of features of residents, their outdoor space, the

development and the surrounding area that are most closely associated with high rates of usage of the outdoor space. The full application of QCA attempts to define the mix of factors that cause a particular outcome. This research is not attempting to define causes but only to identify associations, as it is impossible to know whether an outdoor space is attractive and cared for because people use it or *vice versa*. Confirmation of causality would need in-depth study of the history of individual residential outdoor spaces, a subject for future research.

3.5 Summary of methodology

A large number of variables are identified as possibly being associated with levels of usage of residential, outdoor space. For this reason, the chosen methodology is a cross-sectional one, which is able to gather data from a large number of different sites with a variety of attributes whilst enabling a small number of key themes to be explored in depth. A large variety of sites was investigated in a desk based study using Digimap (©Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.), satellite and birds-eye photographs supplied by www.bing.com and street-view photographs supplied by www.rightmove.co.uk. The main tool for gathering the experience of residents was a postal questionnaire sent out to 9,000 dwellings. This was augmented by semi-structured interviews with residents at a small number of sites which were physically surveyed to triangulate the data gathered in the map-based study. Non-statistical case-based methods of analysis were used to identify the factors most clearly linked with varying levels of usage. Chapter 4 describes in detail how the data were collected and analysed.

CHAPTER 4 DESIGN OF RESEARCH INSTRUMENTS, DATA COLLECTION AND ANALYSIS

4.1 Introduction

In this chapter the details of the methods used to gather and analyse the data are described. In Section 4.2 the relationship between this research and the I'DGO TOO project is clarified and the selection of sites and sampling strategies are discussed. The details of how the data was gathered, including the design of the research instruments, are given in Section 4.3. The main sources of data were the 1328 returned postal questionnaires and the desk-top study of 332 sites. These were augmented by interviews with six respondents and physical surveys of the five sites where they lived. The methods used to analyse the data are described in Section 4.4. The chapter is concluded by the summary in Section 4.5.

4.2 Selection of study sites

4.2.1 Aims and sampling strategy of the I'DGO TOO project

This research uses data generated in conjunction with the I'DGO TOO project.

The aims of the WISE part of I'DGO TOO were:

- To determine the pluses and minuses of 'urban renaissance' developments, in terms of residential outdoor space and quality of life of older residents.
- To determine how, and to what extent, different types of residential outdoor spaces (private gardens, shared gardens, balconies, courtyards, etc.) contribute to the quality of life of older people.
- To identify how best to design different types of residential, outdoor spaces in urban renaissance housing to deliver maximum benefits to older people.

The focus was therefore on comparing urban renaissance (post 2000) developments with earlier ones. The I'DGO TOO team decided to sample sites across Great Britain and to target a mix of different types of developments in the following categories:

- Tenure – private, social and mixed tenure housing
- Region – seven regions: Scotland, Wales and 5 in England
- Settlement types – city, town, village, rural
- Era – from pre-Victorian to Urban Renaissance (post 2000)
- Housing type – terrace, semi-detached and detached houses or bungalows
and apartment blocks
- Density of the development

Within these categories a range of layouts was also selected as shown in Fig 3.1. The I'DGO TOO project also sampled age-specific housing, both private and social (that is, housing with a minimum age limit). The data from these sites is not included in this study.

The aim of the I'DGO TOO team was to obtain 2,800 responses from age-specific and non-age-specific developments. To this was added 1,190 individual houses from areas surrounding the developments, to give a target sample of 3,990. A response rate of 20 to 25% was assumed, so the aim was to send out 16,000 questionnaires against the sampling frame in Table 4.1. It was assumed that response rates from private housing would be better than from social housing and better from age-specific than from non-age-specific housing (Whitfield, 2003). The grey shaded columns in Table 4.1 represent the sample used in this research.

Table 4.1 Sampling frame for I'DGO TOO

Region	Private age specific	Private non-age specific	Social age specific	Social non-age specific	Mixed non-age specific	Total
London	60	60	140	140	170	570
Midlands	60	60	140	140	170	570
North	60	60	140	140	170	570
Scotland	60	60	140	140	170	570
South-East	60	60	140	140	170	570
South-West	60	60	140	140	170	570
Wales	60	60	140	140	170	570
	420	420	980	980	1190	3990

A clustered sampling strategy was used. Residential developments of interest were identified in each region and a range of housing around these developments was selected to be included in the sample.

The individual housing was added for two reasons: firstly, it enabled I'DGO TOO to access older people living in their own homes, without having to discover where they were; secondly, it gave this study a sample of residents with their own individual, private residential outdoor space for comparison with those sharing residential outdoor space.

Several strategies were used to identify possible developments. Housing Associations were approached to join the I'DGO TOO advisory group. Peabody Trust and Places for People joined the group and provided information about their residential developments. Recent (post 2000) developments were

identified from the CABE (Commission for Architecture and the Built Environment) website www.cabe.org.uk (archived on 18th Jan 2011).

For each development considered for inclusion, the location, number of residents, approximate area and population density of the development, the layout and any special features were recorded. Developments were selected from this database to give the range of variables required. Non-age-specific social housing was identified in the surrounding area using information from District, Borough, City and Town Council and urban regeneration web-sites. Appendix A4.1 lists all the web-sites consulted. Sampling within the sites is discussed in Section 4.1.3. Mixed tenure housing was selected in the same areas visually, using aerial and birds-eye views from www.bing.com to give a range of housing age and types.

4.2.2 Summary of relationship between this research and I'DGO TOO

Modifications made to the original I'DGO TOO sampling strategy to accommodate this research are indicated in Table 4.2.

Table 4.2 Integration of sampling strategies

I'DGO TOO approach	Modification	Explanation
Focus on post 2000 developments	Addition of older developments	To provide a more balanced sample
Comparison of age-specific and non-age specific developments	Data from age-specific developments excluded	Interest is in all adults, so avoids sample being structurally skewed to older age groups
Difficulty in accessing older adults in their own home	Sampling individual houses close to developments	Provides a comparison with SROS (Enables I'DGO TOO to identify incidental older people in the sample)

Use and modification of the large database generated for the I'DGO TOO project enabled this researcher to have access to much more data than could have been generated alone. As research assistant on the project this researcher was fully involved in the design of the I'DGO TOO study and its instruments. All the map-based data collection for I'DGO TOO and for this thesis was done by this researcher alone. 332 developments and streets are included in this research.

4.2.3 Sampling strategy within sites

Ideally, the questionnaire should be sent either to the whole population or to a randomly selected sample. A random sample is one in which every member of the population has an equal and independent probability of being selected (McPherson, 2001). Theoretically, a true random sample (assuming it is not too small) will have a mix of characteristics close to that of the whole population, that is, it will be representative of the population. The usual and simplest method of generating a sample of households is systematic sampling in which every i^{th} house is selected. In this research all households in developments of up to 60 dwellings were included, but for larger estates, systematic sampling was used of every 2nd or 3rd house, to generate a sample of about 60 dwellings. Response rates are usually considerably lower from those living in social housing than from those who rent privately or own their own homes (Whitfield, 2003). In a few large social housing estates, such as Peabody's Old Pye Street, all the households were surveyed in an attempt to raise the number of responses from people in social housing in the complete sample.

Such systematic sampling is not random because the selection of each member of the population is not independent. This method may, however, give a more representative sample than a truly random one, as members of the population may be clustered and sampling systematically ensures an even spread of representatives from different clusters. It does cause difficulties in the application of statistical methods (McPherson, 2001), but these are avoided by using non-statistical methods of analysis (see Section 3.4.4). The lack of randomness caused by systematic sampling is, in any case, smaller than that generated by the self-selection of the respondents (i.e. those who complete and return the questionnaire). This self-selection ensures that the final sample is not random and is a major drawback of the self-completed survey. The sample is limited to those people who will fill in and return a questionnaire: a relatively small segment of a given population. The views of those who cannot read English, are too busy or are not interested, are, therefore, not represented. This means that the results cannot be generalised to the wider population (Dunn, 2010).

4.3 Gathering data about the sites

4.3.1 Surveying features of private, shared residential outdoor space

Two methods were used to survey the features of private, residential outdoor spaces (ROS). The features of all 332 sites were assessed in a desk-based survey using a combination of Digimap and www.bing.com birds-eye view. Table 4.3 lists the features of private ROS and their indicators that were measured using desk-based methods. Physical surveys were also done at five sites, which allowed data from the desk-based survey for these sites to be verified.

Table 4.3 Features of residential outdoor space surveyed using desk-based methods

Variable	Description	Units or coding	Sources
Area of site	Measured area of site enclosing households who sent returns	square metres	Digimap
Site built up area (m ²)	Area of buildings in the measured area	square metres	Digimap
Area of site outdoor space (m ²)	Area of outdoor space in measured area = Area of site - Site built up area	square metres	Calculation (see column headed Description) Roof garden areas added manually
Number of dwellings	Number of dwellings in measured area		Digimap, Royal Mail, Housing Association
OS Area per dwelling (m ²)	Area of outdoor space per dwelling = Area of site outdoor space / Number of dwellings	square metres/dwelling	Calculation (see column headed Description)
Greenness	Estimated greenness of surface (proportion of grass or planting) within the measured area	0 = none 1 = less than a fifth 2 = one to two fifths 3 = around half 4 = three to four fifths 5 = over four fifths	Visual inspection of Bing aerial and birdseye pictures
Tree density	Estimated density of trees within and on the boundary of the measured area	0 = none 1 = sparse 2 = moderate 3 = thick 4 = mainly on boundary	Visual inspection of Bing aerial and birdseye pictures
Boundary	Proportion of boundary of the measured area which is open (i.e. un-fenced)	0 = fully enclosed apart from access 1 = up to a quarter open 2 = quarter to a half open 3 = half to three quarters open 4 = over three quarters open	Digimap and visual inspection of Bing aerial and birdseye pictures

Variable	Description	Units or coding	Sources
Layout	Layout of outdoor space in relation to the building(s)	1 = Surrounding 2 = Surrounding and fully enclosed 3 = Fully enclosed 4 = To the rear 5 = To the front 6 = Enclosed 2 sides 7 = Enclosed 3 sides 8 = To rear and front 9 = Surrounding and enclosed 2 sides 10 = Surrounding and enclosed 3 sides 11 = Surrounding 3 sides 12 = Other	Digimap and visual inspection of Bing aerial and birdseye pictures
Off road parking / dwelling	Number of outdoor off road spaces per dwelling	0 = No off road parking 1 = 1 off road parking space/dwelling 2 = more than 1 off road parking space per dwelling 3 = fewer than 1 off road parking space per dwelling	Digimap and visual inspection of Bing aerial and birdseye pictures and streetview
Garages per dwelling	Number of garages (including underground parking) per dwelling	0 = No garages 1 = 1 garage per dwelling 2 = more than 1 garage per dwelling 3 = fewer than 1 garage per dwelling	Digimap and visual inspection of Bing aerial and birdseye pictures and streetview
Era	Estimated era of buildings	1 = 2000 + (Urban renaissance) 2 = 1980 - 1999 (Postmodern) 3 = 1960 - 1979 (Modern) 4 = 1946 - 1959 (Post WW2) 5 = 1919 - 1945 (Inter-war & WW2) 6 = 1901 - 1918 (Edwardian & WW1) 7 = 1837 - 1900 (Victorian) 8 = Pre-1837 (Pre-Victorian)	Housing Association web pages Local Council web pages CABE and RIBA web pages Visual inspection of Google Earth pictures
Max no. floors	Maximum number of floors in domestic buildings within the measured area		Visual inspection of Bing birdseye pictures and Google streetview

4.3.1.1 Layout, area of outdoor space and area per dwelling

The study sites were chosen to give a range of layout types as defined in Figure 3.1. These were identified and recorded using Digimap Carto, which has tools that enable distances between points, perimeter lengths and areas to be measured with some precision. These were used to measure the total area (total measured area) of each site and the area of the buildings on the site and hence calculate the area of outdoor space associated with the dwellings. As the area of residential outdoor space available per dwelling strongly influences how residents use the space (Cooper and Sarkassian, 1986), care was taken to measure these areas as precisely as possible. This section considers the accuracy of these measurements and calculated areas.

What constitutes a site depends on the form of the development. Where the selected development has a clear boundary between public and private space, delineated by buildings, walls or fences, the site is the area enclosed by those boundaries and is well defined. The total measured area of the development is the area enclosed by these boundaries. In some open plan developments the location of the perimeter and the boundaries between public and private outdoor space are not clear. In a number of situations some of this area is clearly public, in others it appears to be semi-public, whilst in others it is impossible to distinguish between private and public outdoor spaces. Some of these ambiguities were resolved using aerial and bird-eye views from www.bing.com or Google map. For others, decisions had to be made about the boundaries of the site and what area to include in the total measured area of the development.

The guidelines behind these decisions are:

- Boundary lines on Digimap are assumed to represent hard boundaries such as fences, hedges or walls.
- Residential roads are not included in the measured area except in cul-de-sacs with open plan front gardens, where there is no through traffic and the road is available for residents' activities, such as children's play.
- Open plan space in front of houses or flats is included unless a public path or pavement crosses it. In this case, only the area between the path and the buildings is included.
- Open space in front of houses and flats, but on the other side of a road, is excluded unless it is enclosed and clearly belongs to the dwellings in the form of detached front gardens or a communal private garden square.
(The road is not included unless this is a cul-de-sac.)
- Parking provided for residents in lay-bys is included as off-road parking.

The site of a perimeter block or tenement is the whole block and the area is usually well-defined. Where the site consists of a street of individual houses, the site is the street with boundaries along the ends of the back gardens and along the sides of the end houses, but the total measured area excludes the area of the road, unless it is a cul-de-sac. Where it was available, birds-eye view on www.bing.com was used to check the assumptions made using Digimap.

Most area measurements were done at a scale of 1:500 (a few sites had shapes that made it necessary to use a slightly smaller scale: 1:650 or 1:720).

Tests of repeatability of whole area measurements (taking the same

measurement six times, but starting at a different point on the perimeter each time) were done at this scale, at intervals throughout the data gathering stage. Repeatability depended on shape. Areas bounded by simple geometric shapes had a range of 15m^2 , but more complex shapes gave a wider range of measurements. The range of area measurements taken in these tests was never greater than 50m^2 . and the standard deviation over all the tests was 35m^2 .

The accuracy of OS MasterMap® Topography Layer offered by Ordnance Survey for structural features such as buildings, is described by three parameters:

1. Geometric fidelity, i.e. the data reflects accurately real-world alignment or shape and adjacent features show correct alignment, distance apart and orientation.
2. Relative accuracy, i.e. positional consistency of a data point in relation to nearby points on the map and the distance between features from the map data proportional to distances measured between the same features on the ground. The standard in urban areas and defined towns is a relative accuracy of $\pm 0.40\text{m}$ root mean square error (rmse), a normal distribution of errors and a maximum error of 0.80m . In rural areas it is $\pm 1.00\text{m}$ rmse, a normal distribution of errors and a maximum error of 1.90m .
3. Absolute accuracy indicates how closely the coordinates of a point in the map dataset agree with the real coordinates of the same point on the ground in the British National Grid reference system. The standard for absolute accuracy in built up urban areas is $\pm 0.4\text{m}$ rmse and a normal distribution of errors so that:
 - 95% of points should be in error by no more than $\pm 0.7\text{m}$;
 - 99% of points should be in error by no more than $\pm 0.9\text{m}$; and
 - no point should be in error by more than 1.2m .

and in rural areas $\pm 1.10\text{m}$ rmse and a normal distribution of errors so that:

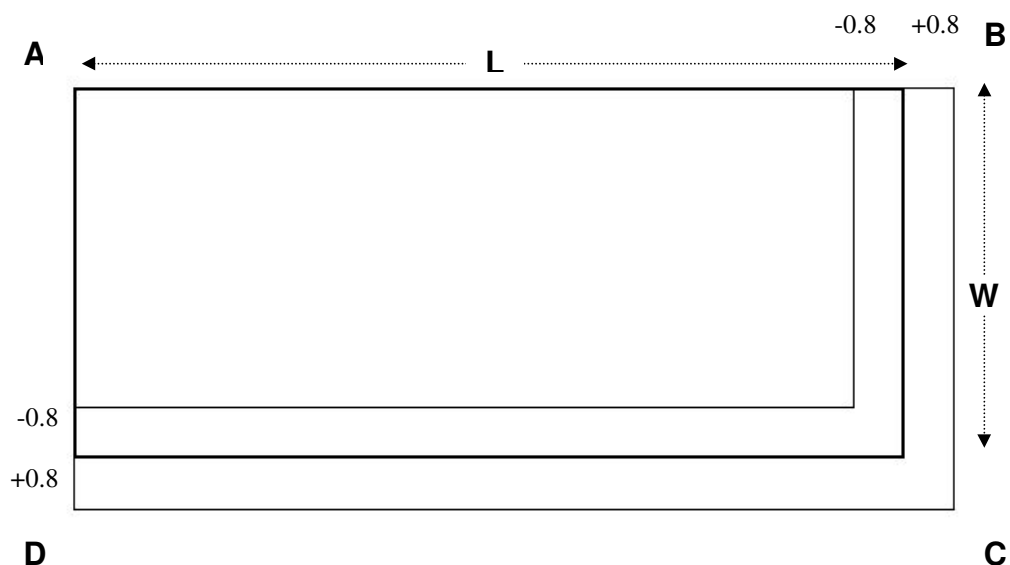
95% of points should be in error by no more than $\pm 1.90\text{m}$;

99% of points should be in error by no more than $\pm 2.40\text{m}$; and

no point should be in error by more than 3.0m .

In this research the data are being used to measure areas, so the absolute positional accuracy is not as important as the relative accuracy of the points. To estimate the order of magnitude of errors in the measured area caused by the maximum relative error in the mapping points consider a rectangle ABCD with length $=L \pm 0.8\text{m}$ and width $=W \pm 0.8\text{m}$

Fig 4.1 Estimate of accuracy of the measured area of a rectangle



$$\begin{aligned} \text{Min possible measured area} &= (L - 0.8)(W - 0.8)\text{m}^2 \\ &= LW - 0.8L - 0.8W + 0.64 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Max possible measured area} &= (L + 0.8)(W + 0.8)\text{m}^2 \\ &= LW + 0.8L + 0.8W + 0.64\text{m}^2 \end{aligned}$$

The range of measurements of the area depends on the magnitude of L and W and hence the size of the area.

For example if the area $\approx 10 \text{ m}^2$ range $\approx \pm 5 \text{ m}^2 \approx \pm 50\%$

if the area $\approx 100 \text{ m}^2$ range $\approx \pm 16 \text{ m}^2 \approx \pm 16\%$

if the area $\approx 1000 \text{ m}^2$ range $\approx \pm 54 \text{ m}^2 \approx \pm 5.4\%$

if the area $\approx 10000 \text{ m}^2$ range $\approx \pm 160 \text{ m}^2 \approx \pm 1.6\%$

This level of accuracy only applies to structural elements, such as buildings.

Some types of feature, such as the centre lines of roads, vegetation and landform limits, are not surveyed, but are estimated subjectively. This means that the accuracy of areas bounded by hedges or changes of vegetation cannot be represented by a numerical estimate.

As the relative error of the measurement of area rapidly decreases as the measured area increases, the largest meaningful area was chosen in each case. For example, individual house garden areas were estimated by measuring the area of a group of houses and taking the average. Where the selected site was a small part of a larger development, an area greater than 1000m^2 was selected as the total measured area. In the sample of 346 sites, 17 (5%) had a total measured area smaller than this. In the measurement of building areas, however, the scale is dictated by the building itself and accuracy is dependent on the size and the form of the building. The width of the line on the map depicting the edge of the building also becomes significant. The accuracy of area measurements of small buildings was therefore checked for geometric fidelity, against reality. For example, a single garage must be large enough to accommodate a car, so an area smaller than 8m^2 is unreasonable, whilst the area of the accompanying house is proportionate to the area of the garage in the same ratio as the rectangles representing the house and garage on the map. The era of a house also gives

clues to a reasonable footprint area and can be checked using the birds-eye view. For example small Victorian terraces are 3 to 4m wide and unextended 1930s, 3-bedroom, semi-detached houses are usually 5 to 6.5m wide (Swenarton, 1981).

4.3.1.1.1 Calculation of the area of outdoor space per dwelling

For each site selected, the outdoor space per dwelling was calculated:

$$\text{Outdoor space per dwelling (m}^2\text{)} = \frac{\text{Area of outdoor space in measured area}}{\text{Number of dwellings in measured area}}$$

The area of outdoor space available was calculated by measuring the area of buildings in the total measured area and subtracting this from the total measured area of the development.

$$\text{Area of outdoor space (m}^2\text{)} = \text{Total measured area (m}^2\text{)} - \text{Area of buildings in measured area (m}^2\text{)}$$

As the edges of outdoor space are often not easily accessed by residents because of the proximity of walls and the spread of hedges, it was decided that it was preferable to under-estimate rather than over-estimate the calculated area of outdoor space. This area of outdoor space was therefore rounded down to the nearest 100 m². Where the area of several gardens combined was measured, the rounding was applied before dividing by the number of gardens.

Where the number of dwellings in a development was not provided by the housing association or council, the dwellings were counted from Carto. This is possible because the maps include house numbers. If this was not clear numbers of dwellings were checked using the Royal Mail website's (www.royalmail.com) 'find an address' service.

4.3.1.2 Greenness, tree cover, parking, boundaries and era

The semi-permanent features of the residential outdoor space of each site were recorded by visual inspection using aerial and birds-eye pictures provided by www.bing.com and Google Earth. There are areas of Great Britain for which birds-eye views are unavailable. For some of these, the excellent quality of the aerial pictures allowed good estimates to be made of greenness and tree cover, though little could be discerned about the type of boundary, era or number of storeys. In some cases, streetview enabled the era and number of storeys to be recorded. In a few cases the quality of the aerial photographs was very poor, so that even building outlines were hard to decipher. In these cases the greenness estimate was made using Digimap as well, but nothing could be recorded about tree cover or boundaries.

There is an unknown time difference between the birds-eye photograph and the time of making the assessments. This was assumed to be of the order of two to five years, but it varies in different parts of the country. Comparison of aerial and birds-eye views of each site that had been built since 2005 suggest that aerial views are updated more frequently than birds-eye ones. As much of the data from residents was gathered during 2008 and the greenness and tree cover assessments were made in late 2010, a lag of two years gives pictures close to the time of the residents' responses. It has been assumed that the boundary, greenness and tree cover of a residential site does not change much in two or three years except where there has been recent building. It is possible, however, that an apparently green site has been hard-surfaced since the birds-eye photograph was taken or that buildings have been extended over the

outdoor space. Such events will only have affected a small number of the total sample and will usually be indicated by the description of their space provided by residents.

4.3.1.3 Physical survey of outdoor spaces

In order to validate the collection of data about the features of the residential outdoor spaces remotely, four sites were physically surveyed (in conjunction with interviewing residents of the developments).

More time was spent at the pilot site than at any other. Several visits were made to the outdoor space and observations of people's behaviour were noted. The researcher introduced herself to residents who were in the space, who showed great interest in the research. With their permission, the content of several informal conversations were recorded in note form immediately afterwards. These conversations informed the development of the written survey, the interview schedule and the survey tools. A checklist of features to be recorded was developed during the pilot stage. The features were recorded on the checklist and on a large-scale plan of the space, which had been prepared from the Carto tool of Digimap. Permission was obtained to further test these tools whilst visiting several London garden squares during the London Open Squares Weekend (www.opensquares.org) in June 2008. This enabled several different types of residential outdoor space to be visited over one weekend without any difficulty obtaining access. Residents and gardeners were available at some of the gardens, which allowed information about the upkeep and management of the outdoor spaces to be discussed. This helped to inform the interview schedule. Marking features on the plan was found to be the

simplest method to record details of the gardens, but the checklist was a good reminder of everything that should be recorded. The checklist is given in Appendix A4.2 and example plans can be found in Chapter 7.

4.3.2 Gathering data about how residents use private residential outdoor space

As discussed in Section 3.4.3.2, a postal questionnaire was the main vehicle for collecting data about the residents and how they used their residential outdoor space. The 1328 valid responses to the questionnaire were augmented by six interviews, four informal conversations and direct observation.

4.3.2.1 Design of postal questionnaire

The questionnaire was designed to collect most of the data shown in Tables 3.2 to 3.5. That is, information about the residential outdoor space, the respondent and their household. No questions were asked about the surrounding area. To make sure that responses were in a form that could be easily analysed, most of the questions offered a range of responses, each with a tick box (Dunn, 2010). The order of the responses offered, from positive to negative, was varied between questions to reduce the chances that respondents would start to tick the same box for each question in an automatic way. To maximise the validity of the questionnaire used in this research, advice was sought from experienced researchers and the literature (Blaxter *et al.*, 2001; Dunn, 2010; Foddy, 1993). Care was taken to ensure that questions were simply worded, unambiguous and clear. Wording was checked with friends and colleagues to ensure clarity and to identify any researcher bias.

Table 4.4 Questions related to the key indicators

(In the order that indicators were discussed in Section 3.3. not in the order of questions in the questionnaire)

Indicator	Question(s)	Responses
Type of residential outdoor space	A1. Do you have access to.....? (Tick all that apply) Tick boxes in two columns, one headed "Your own" the other headed "Shared/communal"	Front garden Back garden Patio, terrace or veranda Yard or equivalent paved area Balcony Courtyard Off-street parking Outdoor space for bins Outdoor roofed storage (shed) Other
Levels of usage		
Activities done in the residential outdoor space	A6. What are the main ways in which you and members of your household use your outdoor space in <u>the warmer months</u> ?	Hanging washing out Entertaining visitors Keeping pets Gardening Growing your own food Eating outside Feeding or enjoying wildlife Sitting and relaxing Talking to neighbours Maintaining your car Exercising Children's play space As an access route Other (please specify)
	A7. What are the main ways in which you and members of your household use your outdoor space in <u>the colder months</u> ?	
	(Please circle how often you usually do each activity: 1 = daily or most days to 5 = never)	Daily or most days At least once a week At least once a month Less than once a month Never Not applicable
Attributes of private residential outdoor space		
Greenness	A2. Overall, how would you describe the outdoor space you have access to?	Very green Fairly green Not very green Not at all green
Accessibility	D3. What is the lowest floor level of your <u>living</u> accommodation?	Basement or semi-basement Ground floor (street level) First floor (floor above street level) Second floor Third floor or higher
Attractiveness	A9. Is there anything that stops you or anyone in your household going out into your outdoor space? (Please tick all that apply)	Noise
Accessibility		Air quality
Air quality		Accessing space is not easy
Noise		Weather (rain/wind/ice...)
Maintenance		Unsuitable for children Poor maintenance Unattractiveness of space Not enough space

Table 4.4 continued		
Indicator	Question(s)	Responses
Barriers to using ROS	A9. Is there anything that stops you or anyone in your household going out into your outdoor space? (Please tick all that apply)	Neighbours Fear of falling Lack of privacy Fear of attack Fear of strangers The effort involved Other (please specify)
Lack of privacy		
Fear of falling		
The effort involved		
Behaviour of neigh's		
Fear of attack		
Attributes of residents and members of their household		
Age	D8. In what year were you born?	
Gender	D7. Are you:	Male Female
Ethnicity	D13 To which of these groups do you consider you belong?	White Black/Black British Asian/Asian British Mixed Chinese Other
Health	C5. How is your health in general?	Excellent Very good Good Fair Poor Very poor Can't say
Employment status	D9. Which of the following best describes your economic status? D11. Which of the following best describes your partner's economic status?	Not applicable Paid employed/self employed Unemployed/seeking work Retired Looking after family/home Full time student Long term sick/disabled Other
Socio-economic status	D10. What work do/did you do? D12. What work does/did s/he (your partner) do?	Open question
Household composition	D5. How many adults (over 18 yrs old) are there in your household, including yourself? D6. How many children are there in your household or who visit you?	Please state number:..... Age In your Visit you Household 0 – 4 years 5 – 11 years 12 – 18 years
Length of residence in current home	D4. How long have you lived in your current home?	Years..... Months.....

Table 4.4 continued		
Indicator	Question(s)	Responses
Tenure	D1. Do you (or another household member) own or rent your home?	Own outright or with mortgage/loan Pay part rent / part mortgage Rent from housing assoc. or council Rent from a private landlord
Able to make changes	A8. Do you agree or disagree with the following statements about your outdoor space? (Please circle, 1 = strongly disagree and 5 = strongly agree) I am able to do everything I would like to do in this space. I can change things in my outdoor space if I want to.	Strongly disagree Disagree Neither agree/disagree Agree Strongly agree
Satisfaction with residential outdoor space	A3. Overall, how satisfied are you with your outdoor space? Tick boxes in two columns, one headed "Your own" the other headed "Shared/communal"	Very dissatisfied Fairly dissatisfied Neither satisfied nor dissatisfied Fairly satisfied Very satisfied Can't say
	A4. What do you like most about your outdoor space?	Open question
	A5. What would you change about your outdoor space if you could?	Open question
Importance of residential outdoor space	A8 Do you agree or disagree with the following statements about your outdoor space? (Please circle, 1 = strongly disagree and 5 = strongly agree) My outdoor space is very important to me.	Strongly disagree Disagree Neither agree/disagree Agree Strongly agree
Perception of community spirit	C2 Would you say that the community spirit in your neighbourhood is....?	Very strong, Fairly strong, Not very strong, Not at all strong Can't say

Table 4.4 continued		
Indicator	Question(s)	Responses
Ideal uses of residential outdoor space	A11. For you, what would be the most important purposes of your ideal outdoor space? (Please rank as many as you like where 1 = most important, 2 = the next most important etc.)	I think that it is important for my ideal outdoor space to provide: Rank Space for visitors e.g. friends/family Space for children to play Opportunity to garden/grow food Space for eating outside Space for feeding/enjoying wildlife Space to hang washing out Space for sitting and relaxing An attractive environment Space to maintain car or property Space for exercise Opportunities to chat to neighbours Space for storage An enhanced image of my home Space for pets Sufficient space for parking
Attributes of the dwelling and the development		
Type of dwelling	D2. What type of accommodation do you live in?	Detached house / bungalow Semi-detached house / bungalow Terraced house / bungalow End of terrace house / bungalow (data taken as semi-detached) Flat, maisonette or tenement Other (please specify)
View from the dwelling	B3. What best describes <u>all the views</u> from your home? (Tick all that apply)	Garden (yours and/or neighbours) Countryside Street Woodland/other wild space Park/other maintained green space Neighbouring buildings Off-street parking or garages Outdoor space for waste bins Other (please specify)
Greenness of the view	B4 Overall, how green is the <u>view from the LIVING AREA</u> in your home? B5 Roughly how many trees can you see <u>from your LIVING AREA</u>	Very green Fairly green Not very green Not at all green None Less than 10 Between 10 and 50 More than 50

Respondents were asked about their outdoor space first: type, greenness, satisfaction with it and how often they did the different activities in it. To answer this last question, respondents were asked to circle a number representing frequency for each activity on two matrices of activity against frequency. The first matrix (A6) was for activity in the warmer months and the second (A7) asked about activity in the cooler months. Question A6 is reproduced below.

A6. What are the main ways in which you and members of your household use your outdoor space in the warmer months? (Please circle how often you usually do each activity: 1 = daily or most days to 5 = never)

Activity	Daily or Most days	At least once a week	At least once a month	Less than once a month	Never	N/A	Tick if you do this in <u>shared</u> space?
Hanging washing out	1	2	3	4	5	6	
Entertaining visitors	1	2	3	4	5	6	
Keeping pets	1	2	3	4	5	6	
Gardening	1	2	3	4	5	6	
Growing your own food	1	2	3	4	5	6	
Eating outside	1	2	3	4	5	6	
Feeding or enjoying wildlife	1	2	3	4	5	6	
Sitting and relaxing	1	2	3	4	5	6	
Talking to neighbours	1	2	3	4	5	6	
Maintaining your car	1	2	3	4	5	6	
Exercising	1	2	3	4	5	6	
Children's play space	1	2	3	4	5	6	
As an access route	1	2	3	4	5	6	
Other (please specify)	1	2	3	4	5	6	

Respondents were asked about their activity in the warmer and cooler months rather than in summer and winter. This is because the vagaries of the British climate in recent years mean that good weather for being outside often occurs early in spring or late in autumn. Using the terms warmer and cooler avoids respondents being distracted by wondering whether a spring or autumn activity should be recorded under summer or winter. Respondents were asked to tick the last column if the activity was done in shared space.

These two questions have a broad frequency scale, ranging from 'daily or most days' to 'never'. The categories are worded so that respondents need not wonder if 'daily' means every single day. The middle response on the scale is 'at least once a month'. This means that people are likely to subconsciously view this frequency as average (as discussed in Section 3.4.3.2.3.1). Those who consider that they are frequent users of their outdoor space, therefore have a choice of two 'above average' frequencies and will be comfortable selecting 'at least once a week' if they feel that 'daily or most days' would be an exaggeration. A middle response of 'at least once a week' would tend to encourage respondents to over-estimate the frequency of their activity.

To find out about the attractiveness and the impact of external factors on residents' use of their spaces, they were asked if there is anything that stops them from going into their outdoor space and offered a list of possible reasons (see Table 4.3).

The next few questions were about residents' relationships with their outdoor space. They were given a series of statements about this and asked to what extent they agreed or disagreed with them.

To allow respondents to comment on aspects of their residential outdoor space that are most significant to themselves, they were invited to write more about their outdoor space by two open questions:

A4. What do you like most about your outdoor space?

A5. What would you change about your outdoor space if you could?

These questions were placed immediately after the one asking respondents how satisfied they are with their outdoor space, early in the questionnaire, so that the answers to them were not influenced by later questions. Their immediate response was required without too much thought. Had these open questions been placed after respondents had answered the questions about usage, for example, their responses were likely to be coloured by thinking about what they could or could not do in the space (Blaxter *et al.*, 2001; Dunn, 2010; Foddy, 1993; Gray, 2004). The order of questions in this section was designed to allow their thoughts to flow easily from the type of space, through what they felt about it, to what they did in it. They were then asked questions relating to their relationship with the space, what (if anything) stopped them going into their space and what their ideal outdoor space would be. In the final question about their space, they were asked to rank a list of purposes of their ideal space. These were the activities that they had already considered in questions about

activities, A6 and A7, plus the more passive purposes: sufficient space for parking; an attractive environment; an enhanced image of the home and space for storage.

In Section B, the resident was asked about the view from the dwelling. After being asked how important it is for them to have a pleasing view (B1) and how satisfied they are with the view (B2), each resident was asked three questions to describe the view that they have. These were B3 'What best describes all the views from your home', B4 'Overall how green is the view from the living area in your home and B5 'Roughly how many trees can you see from your living area?' The responses offered for these questions can be seen in Table 4.4. As discussed in Chapter 2, evidence suggests that a green, natural view enhances mood and reduces feelings of aggression (Hartig and Staats, 2006; Kaplan *et al.*, 1989; Kuo and Sullivan, 2001a and b). In many situations, residential outdoor space is a major component of residents' views and this is one of its passive uses. These questions were asked in order to explore the importance of this function to residents. Finally, they were asked to rank a list of features in their order of importance as the components of their ideal view. This was to identify if residents of different developments require different elements in their view.

Section C asked Quality of Life questions designed for I'DGO TOO.

Section D sought demographic information, including tenure, type of accommodation, time of residence, number of adults and children in the household, gender, year of birth, economic status of self and partner and ethnic

group. These questions and their responses were designed to be compatible with Census questions so that comparisons may be made with Census data if required in further research. A space at the end of the questionnaire was provided for further comment.

Participants were also given a box to tick if they might be interested in taking part in a later interview.

The order of questions aimed to minimise the impact of earlier questions on answers to later questions. For example, residents were asked about their ideal residential outdoor space after they had answered questions about their actual space. It was considered preferable that their answers about their ideal space might be influenced by their answers about their actual space than *vice versa*. The layout of the questionnaire was designed to be attractive and easy to read and understand and it was presented in an informal way so that it did not look too 'bureaucratic'. The first draft of the questionnaire was tested on family, friends and colleagues to detect any ambiguity or lack of clarity. The modified questionnaire was then piloted as described in Section 4.3.2.1. The final version of the questionnaire is given in Appendix A4.3

The questionnaire text was printed in Arial 14 point to ensure that older people would be able to read it easily. The front cover had 2 photographs of residential outdoor spaces and some rhetorical questions in large print to raise interest. It was laid out to look informal, uncrowded and easy to fill in. It was sent out with a covering letter, as shown in Appendix A4.4 and a return envelope.

4.3.2.2 Distribution and return of questionnaires

4.3.2.2.1 Piloting the questionnaire

The questionnaire was piloted in the summer of 2008 in streets surrounding a tenement block in Dalry, Edinburgh. 549 questionnaires were sent out and 93 returned, giving a response rate of 17%. This is a low response rate, which is not unexpected in an area of mainly renting flat dwellers, who are more mobile than owner-occupiers of houses (Pickvance, 1973). Michelson (1977), in his longitudinal study of residential moves in Toronto found that in Phase IV, four years and two months after their initial residential move, 86.4% of those in city centre flats and 75% of those in suburban flats had moved again (some more than once) Most of these residents were tenants. 13.6% of those in city centre and 16.4% of those in suburban houses (about half of whom were tenants) had moved during the same period. More mobile residents are much less likely to answer questionnaires about their residential outdoor space as they consider their dwelling to be a temporary home (Michelson, 1977). In Dalry, the Edinburgh Backgreens Initiative had surveyed residents in the same area about their backgreens two years before this pilot study and achieved a 10% response rate (Canmore Housing Association and Re:Solution, 2004).

Half of the questionnaires sent out had colour pictures on the front cover, the rest were all black and white. Colour caused no improvement in the response rate, so, in view of the increased cost, all subsequent questionnaires were printed in black and white. As a result of the pilot, more detailed instructions were added to questions A6 and A7 and instructions were made clearer for questions A10 and A11. The question about the components of your ideal view

was changed to a ranking exercise and moved to the end of Section B. Minor adjustments were made to the layout of the questionnaire to improve clarity.

4.3.2.2 Main distribution

Correct addresses for the distribution of questionnaires were obtained from the Royal Mail website's 'find an address' service (www.royalmail.com).

Questionnaires were individually coded and sent out in batches of 300 - 400 between September 2009 and September 2010. Returns were recorded in an Excel database. A second copy of the questionnaire was sent out with a reminder letter approximately six weeks after the initial mailing, to addresses that had not yielded a response. 8,828 initial questionnaires were sent out and then a further 7,759 reminders. The total number of returns after removal of blank forms, duplicates and forms with their ID numbers removed was 1331. This represents a response rate of $1331/8828 = 15.0\%$. The range of response rates from different regions of Great Britain was 6 – 28%.

4.3.2.3 Interviews and site surveys

Initially, it was planned to select five or six contrasting sites for more in-depth study. These sites would be visited, surveyed in detail and four residents of different ages at each site would be interviewed. This would provide evidence for the degree of validity of the questionnaire data. As the research progressed these plans changed for the following reasons:

1. During the research the development of aerial, birds-eye and streetview photographic data led to great improvements in coverage and quality. It was realised that information about the greenness, tree cover and basic design of residential outdoor spaces could be obtained for a large proportion of the sites using these sources of data.
2. About one third of the questionnaire respondents ticked the box indicating that they might be interested in being interviewed. When about a year later samples of these respondents were approached for interview, very few responded positively. Almost all those who did respond were professionals aged between 25 and 40. At only one site was more than one interview offered.
3. The handling of the large amounts of data generated by the questionnaires and desktop study left little time to try to generate more interviews.

It was decided to focus on the photographic evidence available. Fifteen sites with good questionnaire responses and high quality satellite pictures were selected for more detailed analysis. Five sites, including the pilot site, in Scotland, were visited and six interviews were conducted. These interviews were used to explore some of the issues arising from the questionnaire data. The letter and information sheet sent out to invite them to interview are shown in Appendix A4.5.

4.3.2.3.1 Design of the semi-structured interview

The interview structure is reproduced below.

Interview Questions

Your relationship to the outdoors

1. Describe your favourite place
2. How important is it to you to be able to get outdoors?
3. What do you enjoy most about being outdoors?
4. Where do you go to enjoy being outdoors?
5. Are there local outside spaces that you regularly use? (apart from streets)
6. What do you like about them?
7. What are your main forms of exercise?

Design and management of the residential outdoor space

8. If you were telling someone who had never been here what it was like, how would you describe your shared space / courtyard / grounds?
9. You said that you like(refer to form) best, what else do you like about the space?
10. What about improvements that you would like to see?
11. Who looks after this space? (and who pays?)
12. How well do you think that the area is maintained?
13. How would you improve the management of this space?
14. So, how are you residents involved?
15. Who does this space belong to?

What you do in your residential outdoor space

16. When did you last go into your outdoor space
17. What did you do there on that occasion
18. Query or probe any uses on the form to maximise information
19. What communal or shared activities happen in this space? (organised and spontaneous)
20. Are there any things that you would like to do in this space, but feel unable to?
21. Why is that?
22. What are the key benefits from this space for yourself and others?

The interview was designed to fulfil several functions. Firstly, the researcher's visit to the outdoor space and exploration of what interviewees did in the space were compared to their responses to the written questionnaire to triangulate the data (Blaxter *et al.*, 2001; Dunn, 2010; Foddy, 1993; Gray, 2004). Secondly, areas which could not be covered in the questionnaire were investigated. These included the interviewee's relationship with the outdoors generally. Specifically, interviewees were asked how important it is to them to be able to get outside and where they usually go to get outside. This led to exploration of why being outside was important (or not) and what drew them to specific locations. The answers to these questions were compared to their stated usage of their residential outdoor space. Where interviewees like to get outdoors, the amount of use that they make of their residential outdoor space will be more strongly associated with the suitability of that space for their needs than where interviewees dislike getting outdoors. The arrangements for care and maintenance of the space were also discussed. As indicated in Chapter 2, the quality of maintenance is a key factor in people's use of, and satisfaction with, outdoor spaces. Thirdly, responses to the questionnaire were explored in more depth and any ambiguities or lack of clarity were probed. For example, interviewees were asked when they last went into their residential outdoor space and what they did there. Follow-up questions led to a discussion of what they liked about the space, what they would change if they could, privacy, safety and security and relationships with other residents and neighbours.

Notes were taken of key points, voice tone and body language. All the interviews were recorded with the permission of the interviewees. Where possible the

interviewee accompanied the researcher on a walk around their residential outdoor space during the interview. This allowed the interviewee to guide the interviewer to features of particular significance to them and increased the informality of the interview. This helped respondents to access their sense of place and memories attached to the space (Anderson, 2004; Hall *et al.*, 2006; Kusenbach, 2003).

All but one of the interviews took about one hour to complete. (One interview, with a woman who had substantial issues with her neighbours took nearly two hours.)

4.3.2.4 Sketch maps and photographs

Conducting interviews gave the researcher the opportunity to incorporate other methods of collecting data into the meeting. Before the start of each interview the interviewee was asked to draw a sketch map, or picture, of their residential outdoor space. They were provided with a sheet of good quality A4 drawing paper and a selection of coloured crayons and felt pens. Audio recording was done, with their permission, so that any comments they made whilst doing this were captured. Meanwhile, the interviewer, with their permission, took photographs of the view out of their living area window. This enabled the interviewee to draw freely without feeling that they were under observation. The sketches were made without reference to the space itself so they provided a record of what the interviewee could remember about the space and which features were significant to them. The photographs of the view were later compared to their responses about the view in their questionnaire to provide triangulation with the questionnaire responses.

4.3.3 Gathering data about the surrounding area

4.3.3.1 Settlement size, residential location and access to public space

It was postulated in Section 2.5.2 that usage of private residential outdoor space may be influenced by the presence of nearby countryside or public outdoor spaces. To investigate this, settlement size and the presence of public outdoor spaces nearby were recorded for each development. The surrounding area was also characterised by the distance to the nearest shops, to differentiate between urban centre and mainly residential locations.

The size of the settlement that each development was part of was visually compared to a 300m, 1 km or 2km radius circle, using the Digimap Carto tool. The settlement was then allocated to the appropriate type as described in section 3.4.3.3.1. Most settlements obviously fitted into a particular type. To match long thin settlements, such as Todmorden, into the typology, their area was measured and compared to the area of the appropriate circle.

Digimap was used to measure the distance to the nearest shop by the easiest walking route. Bing birds-eye and Google streetview were used to check that routes were walkable, public rights-of-way. The residential location of each development was classified according to this distance as:

1 = Shops within 300m

2 = Shops further than 300m

3 = Shops further than 300m and site on settlement edge

300m takes about 5 minutes for a fairly active adult to walk. Natural England (was English Nature) claims that everyone in a town or city should live within

300m of a small (2 hectares) local green space (English Nature 2003). This is the distance chosen as representing a reasonable walking distance.

Types of public outdoor space were identified using Digimap and www.bing.com.

The nearest two to the development (identified by the shortest walking route, measured using Digimap's Carto tools) within a 300m distance were recorded according to type, as follows:

1 = Park / playground

2 = Recreation ground / playing field

3 = Public square / plaza / village green

4 = Nature reserve / countryside / common

5 = River / canal towpath

6 = Beach / coastline

7 = Other

0 = No public open space except roads within a 300m walk

4.3.3.2 Inequality of residential outdoor space

Inequality of residential outdoor space was assessed visually from Carto maps.

The type of inequality was assessed as being even (that is, inequality is low and there is little variation of plot size); a few dwellings with a larger plot than most; a few with a smaller plot than most and a mixture of plot sizes. The degree of inequality was estimated as the ratio of the smaller plots to the larger ones, from 1:1 or even (no inequality) to a ratio of 1:5 or more.

4.3.4 Overview of data collected

The work described above provides a rich pool of data. In the next section the methods used to relate the quantitative descriptions of features of the spaces, generated by the desktop study, to the quantitative data from the written survey, are described. Additional qualitative data is extracted from the responses to the open questions of the written questionnaire, which nearly 80% of respondents answered, and the additional comments made by 16% of respondents at the end of the questionnaire. These data together with the interview data identify the key activities and concerns of these residents. Further triangulation is provided by comparison of the assessments of the key features of residential outdoor space made by the researcher and those described by respondents in the survey.

4.4 Data analysis

4.4.1 Analysis of quantitative data

Questionnaire data entry was managed by Dr Chris Stride of the Institute of Work Psychology at the University of Sheffield as part of the I'DGO TOO project. SPSS version 16 was used to generate descriptive statistics of the sample of 1328 complete questionnaires.

4.4.1.1 Investigating relationships between usage and other variables

The sample was divided into sets according to whether respondents had access to shared or individual ROS, or both, as described in Section 5.2. The number of respondents doing each activity at least once a week, in the warmer months, in each set and in the whole sample, was generated using SPSS 16. The number of respondents who never used their residential outdoor space for each activity and

the number of different activities done at least once a week were also examined. This enabled differences in usage between the different sets to be identified.

Using SPSS 16, frequencies of responses to the questionnaire questions were generated to explore these differences in more detail. For cross-tabulations against usage, a level of usage shown by at least 70% of respondents with access to individual residential outdoor space only was selected as representing a measure of usefulness. This level was doing at least four different activities at least once a week, in their residential outdoor space, in the warmer months, and is close to the mean number of activities done at least once a week for the whole sample. Residents who were doing this number of different activities are defined by the researcher as getting reasonable usage from their space. This definition of usage is used throughout the analysis. Cross-tabulations of this level of usage against all the variables of interest were generated, to establish which variables are linked with variations in usage (Achen, 2002, cited by Aarts, 2007).

Frequencies of each variable were also generated for each set, to identify significant variations between the sets, which might be associated with differences in usage. This analysis enabled a list of variables linked with differences in usage between the different sets to be produced.

To establish the importance of different combinations of variables case-based analysis was done using Ragin's fsQCA software (<http://www.u.arizona.edu/~cragin/fsQCA>). The variables are dichotomised for this analysis. This was done in two ways. For variables, such as age, for which the outcome across the whole range is required, a series of dichotomised

variables was produced by entering each age band as a variable either present or not present. For other variables, such as number of dwellings sharing the residential outdoor space, the cross-tabulation with usage enabled a cut-off point to be defined between high and low rates of usage.

Case based analysis was done for small sets of associated variables. For example, age of respondent and number of adults and children in the household were analysed together. The fsQCA software generates all the possible logical combinations of selected variables into a table of sets of cases with the values of each variable the same. The number of sets generated = 2^n , where n is the number of binary variables represented, and therefore increases rapidly with the number of variables. The software treats each questionnaire response as a separate case and allocates it to the appropriate set. Many of the combinations of variables are not represented in the sample. For example, only one of the age band variables can equal 1 (i.e. is present), so all the sets with more than one age band variable equal to 1 are impossible and can have no cases in them. The software also calculates the proportion of cases in each set that show the outcome (usage ≥ 4 activities, at least once a week). This is given as a table. An example table showing the first twenty-one most populated sets only, is given in Appendix 4.6. The proportion of the cases in each set that have the positive outcome is shown in the column headed *raw consistency*. (*PRI consistency* is an alternative measure of consistency, which is not used in this analysis. It is only relevant for fuzzy sets, and equals *raw consistency* in this analysis, where the sets are crisp. That is, each case completely belongs to one set and one set only. *Product* is the product of the two consistencies; in this case degree of consistency squared

(Ragin, www.u.arizona.edu/~cragin/fsQCA). The set with the largest number of cases (52) consists of established couples with a child or children in the household and 75% of them do four different activities in their ROS at least once a week. This table can be sorted according to raw consistency as shown in Appendix 4.7. The top nine rows have 100% positive outcome, but only represent a small proportion of the sample (13 cases). Visual inspection of the sets with 75% or more of the cases with a positive outcome immediately underlines the significance of particular variables (having children in the household and visiting children).

The fsQCA software leaves the outcome column (headed high usage in Appendices 4.6 and 4.7) blank so that the researcher can enter the outcome as 1 (true) or 0 (false) according to their judgement of how consistent the cases in a set should be to represent the outcome. For example, outcome = 1 if raw consistency > 60%. The table is then minimised by combining sets with similar levels of consistency that display a difference in only one variable.

Table 4.5 Example of how the table of sets is minimised

Young 18-29 yrs	Established 30-41 yrs	Middle aged 42-53 yrs	Ma- ture 54-65 yrs	Older 66-77 yrs	Elderly 78 plus yrs	Have child /chil- dren	Sin- gle	Pair	Mul- tiple	Child -ren visit	Number of cases	Raw consist.
0	0	0	1	0	0	1	0	1	0	1	2	1
0	0	0	1	0	0	1	0	0	1	1	2	1
0	0	1	0	0	0	1	0	0	1	0	2	1
0	0	0	1	0	0	1	0	1	0	0	2	1
0	1	0	0	0	0	1	0	0	1	1	1	1
0	0	0	0	1	0	1	1	0	0	1	1	1
0	0	0	0	1	0	0	0	0	1	1	1	1
0	0	0	1	0	0	1	0	0	1	0	1	1
0	0	0	0	1	0	1	0	1	0	1	1	1

For example, the shaded sets of Table 4.5 all contain mature respondents with children at home and raw consistency equal to 1. Rows 1 and 2 can be combined as one set with visiting children and more than one adult. Rows 4 and 8 can be combined into a similar set without visiting children. These two sets can then be combined into a set where visiting children is not significant as shown in Table 4.6.

Table 4.6 Minimising the table of sets

Young 18-29 yrs	Established 30-41 yrs	Middle aged 42-53 yrs	Mature 54-65 yrs	Older 66-77 yrs	Elderly 78 plus yrs	Have child /children	Single	Pair	Multiple	Child -ren visit	Number of cases	Raw consist.
0	0	0	1	0	0	1	0				7	1
0	0	1	0	0	0	1	0	0	1	0	2	1
0	1	0	0	0	0	1	0	0	1	1	1	1
0	0	0	0	1	0	1	1	0	0	1	1	1
0	0	0	0	1	0	0	0	0	1	1	1	1
0	0	0	0	1	0	1	0	1	0	1	1	1

This variable is not influential on the outcome in the combination of variables in the two combined sets and is eliminated from these sets only. The variable remains in all other sets, as it may be influential in sets with different combinations of variables. Rows 4 and 6 in Table 4.6 may be similarly combined. Minimisation was done by the researcher in Excel (and not using the fsQCA software) so that decisions about which sets to combine were made using the researcher's observations of how variables were relating to each other, rather than by the logical rules embedded in the software, which do not recognise connections between the variables.

Table 4.7 lists the combinations of variables analysed in this way. Repeated application of this analysis to different groups of variables allowed combinations of variables associated with high and with low probabilities of usage to be identified.

Table 4.7 Combinations of variables analysed using fsQCA software

Whole sample	Attributes of the dwelling Dwelling type Tenure Lowest storey of dwelling,	
	Stage of life Age Length of residence Socio-economic group Employment status Number of adults in household Number of children in household Number of visiting children	
SROS set only	Attributes of the dwelling and location Dwelling type Tenure Maximum number of floors	Era Settlement size Residential location
	Attributes of the development Age of the development Layout type Number of dwellings sharing outdoor space Area per dwelling Greenness Tree cover Boundary Inequality of outdoor space Maximum number of storeys Number of parking spaces per dwelling Number of garages per dwelling	
	Stage of life Age Number of adults in household Number of children in household Number of visiting children	
	Age Socio-economic status Employment status	
	Barriers to usage Noise Lack of privacy Poor maintenance	Unattractiveness Neighbours Fear
	Final analysis SROS set only	Dwelling type Tenure Lowest storey of dwelling Area per dwelling Number of dwellings sharing space Employment status Number of children in the household Number of visiting children

This analysis was done for the whole sample initially and then just for the set of respondents with access to shared space only. When the key combinations of variables for high usage had been identified, the relationships were explored in more detail for nine cases of shared space, with different levels of usage, to identify the features that may account for these differences.

4.4.2 Thematic analysis of qualitative questionnaire data

Respondents to the questionnaire were given the opportunity to expand on their views about their residential outdoor space by answering two open questions:

A4. What do you like most about your outdoor space?

A5. What would you change about your outdoor space if you could?

These open questions were answered by 78% and 72% of the respondents respectively. Space was also made available at the end of the questionnaire for additional comments and this space was used, sometimes at some length by 213 (16%) respondents. Recurrent themes were identified from these comments by visual inspection.

4.4.3 Thematic analysis of interview data

Each interview was transcribed and themes identified immediately after the interview. Subsequent interviews were used to explore these themes in more depth.

4.4.4 Survey of features of the residential outdoor space

At each interview site the outdoor space was visited in the company of the interviewee (with one exception). The area was later photographed and surveyed by the researcher. Features such as trees, boundary and path materials, planting and level of maintenance were recorded on a copy of the Digimap image of the outdoor space. These maps were used to corroborate the description of the site's features from the birds-eye view. If the living area overlooked the outdoor space photographs were taken from inside the dwelling.

4.5 Summary of data collection and analysis

The postal questionnaire provides the main source of data about how residents use their residential outdoor space. The differences between the way that residents with their own individual outdoor space and those with access to shared space only, use their space, are explored. The features of the space, the residents and the context that they are in that are associated with variations in usage are identified. These are analysed on a case basis rather than a variable one to find the combinations of these variables that are most closely associated with high levels of usage. The activity at nine selected developments is then examined in detail to establish how these combinations of variables influence usage of ROS. More detailed evidence from visits to five sites and interviews of six respondents is used to amplify the findings.

In the following chapter data from 1328 questionnaires is used to identify the level of usage of residential outdoor space (ROS) and to explore the differences in usage between residents with individual and those with shared ROS.

CHAPTER 5 HOW RESPONDENTS USE THEIR RESIDENTIAL OUTDOOR SPACE

5.1 Introduction

In this chapter the first two research questions are explored:

- What are the differences between the ways that residents with individual, and those with shared, private residential outdoor space use their space and how do these compare with those who have access to both?
- Do residents of housing developments in which only shared, private residential outdoor space is provided; use that space in the way that they would like?

5.2 Measurement of usage

Respondents to the questionnaire were asked to indicate how frequently they used their residential outdoor space (ROS) for a range of activities in the warmer months (question A6) and in the colder months (question A7). As expected, most respondents recorded lower levels of usage in the colder months, though for *access*, *keeping pets* and *enjoying wildlife* this reduction is less than 10%. Half as many respondents use their ROS to *hang washing out* or for *children's play* in the colder months than in the warmer months and few *entertain visitors*, *sit and relax* or *eat outside* when it is cold. Colder weather, therefore, has a greater effect on some activities than on others, and over-rides all other factors for some of them. The data for usage in the colder months is skewed by this differential impact and is therefore excluded from further analysis. This chapter considers activity in the warmer months only.

Valid responses to the questionnaire were received from 1331 households.

Three of these gave data about the view, but not about the residential outdoor space that they had access to. So, for the following analysis the total valid sample size is 1328.

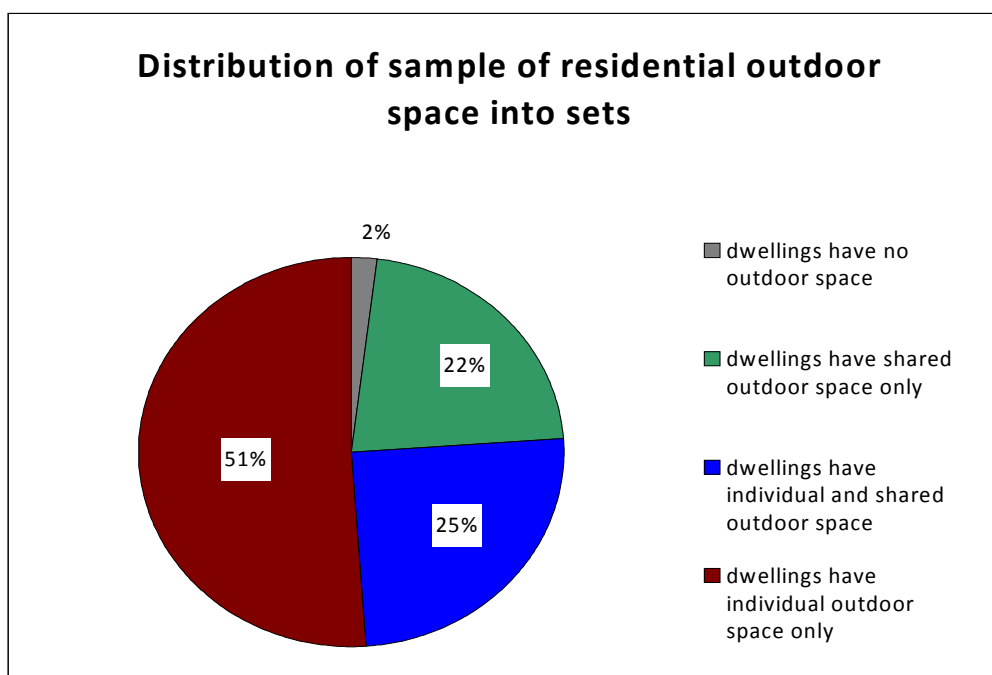
This sample is divided into four sets according to respondent's answers to question A1, which asked them to identify the different types of individual and shared ROS that they have access to:

The sets are dwellings with:

SROS	Shared residential outdoor space only	= 293 cases (22%)
IROS	Individual residential outdoor space only	= 678 cases (51%)
ISROS	Individual & shared resid'l outdoor space	= 332 cases (25%)
NROS	No residential outdoor space	= 25 cases (2%)
Total		= 1328 cases

The two sets of those with shared residential outdoor space (SROS and ISROS) can also be combined to form a set of respondents with access to some shared residential outdoor space, SSROS = 625 cases (47%)

Graph 5.1



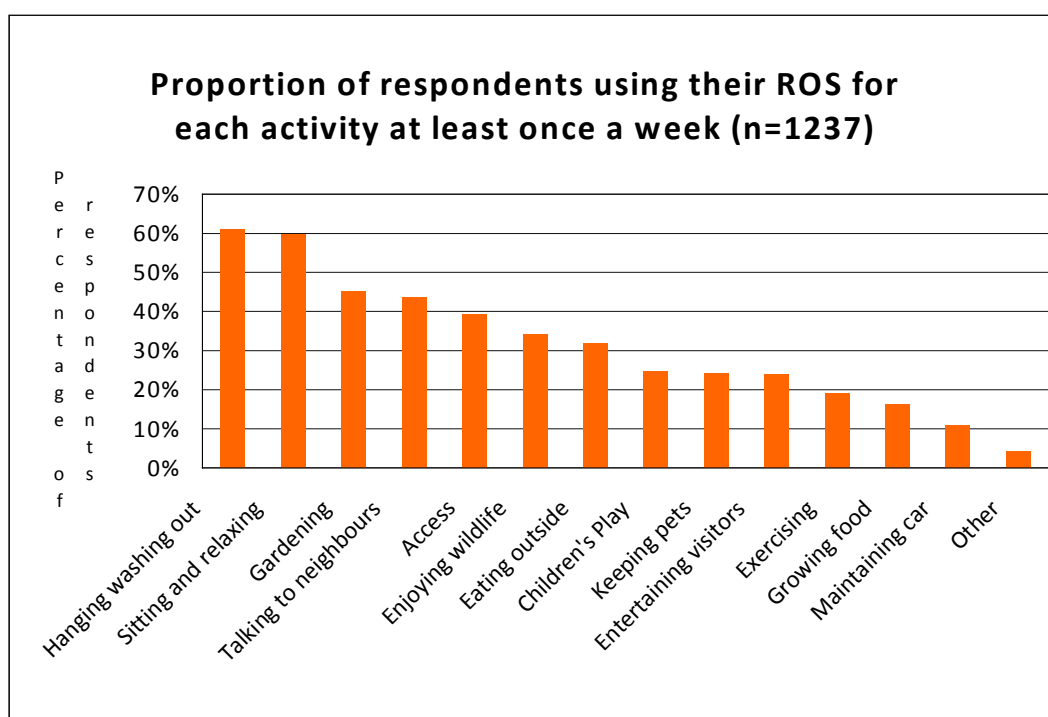
5.2.1 Frequency of activity in residential outdoor space.

In Section 5.2.1.1 the frequency of each activity in the residential outdoor space is considered for respondents from the whole sample who answered the activity question (A6) (n=1237). The frequency of activities in each of the sets is described in Section 5.2.1.2.

5.2.1.1 Whole sample

Graph 5.2 shows the proportion of respondents from the whole sample who undertake each activity in their outdoor space more often than once a week in the warmer months. Ninety-one respondents did not answer this question; twenty-five of these residents have no access to any residential outdoor space.

Graph 5.2

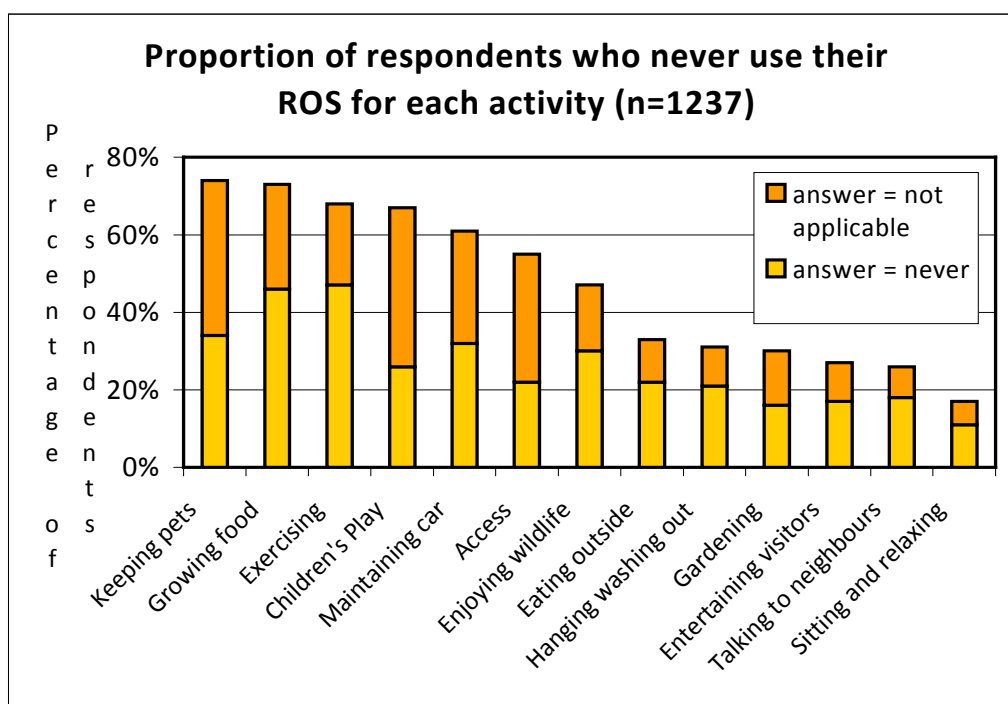


Hanging out washing and sitting and relaxing are the most popular activities, each listed by about 60% of the respondents. More than 40% of respondents *garden* or *talk to their neighbours* regularly. *Enjoying wildlife* and *eating outside* are mentioned by over 30% of respondents.

Children's play, keeping pets and entertaining visitors are more specific activities, only of interest to particular segments of the population (those who have or are regularly visited by children, keep pets and enjoy entertaining, respectively). Each of these constitutes a regular activity for more than 20% of the sample. *Exercising, growing food and car maintenance* are less popular activities. Only 4% of the sample mentioned an activity not offered in the questionnaire, which suggests that the list of activities offered is reasonably comprehensive.

Graph 5.3 shows the proportion of respondents who never do each activity in their residential outdoor space or consider it not applicable to them.

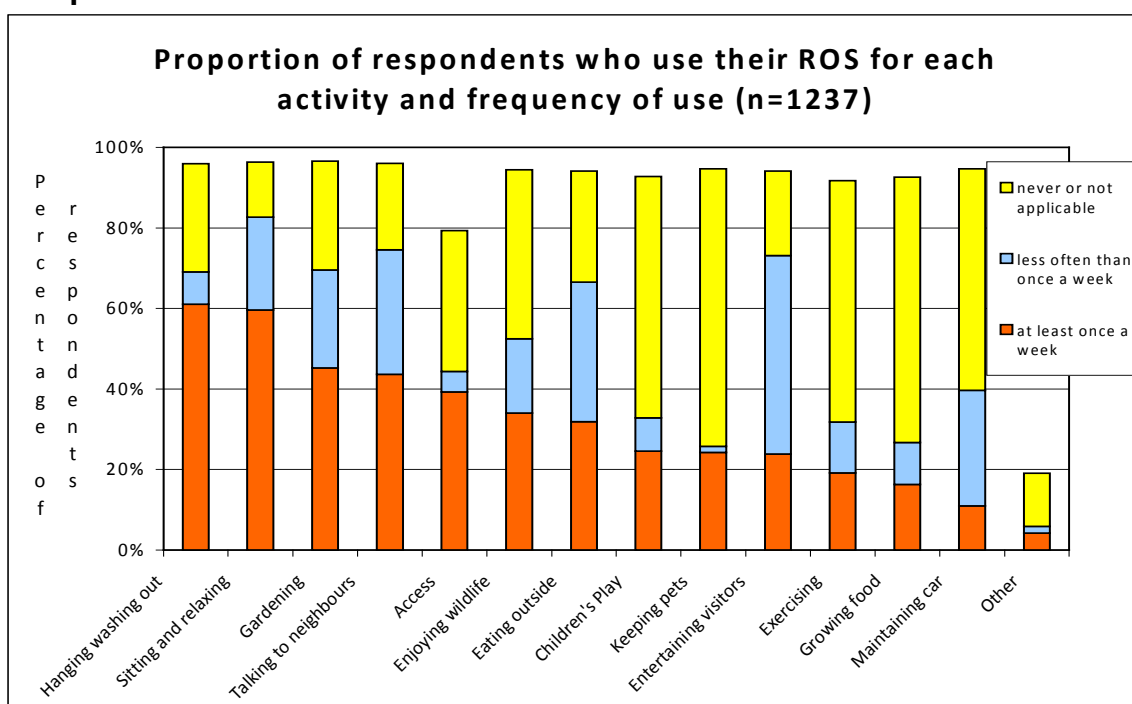
Graph 5.3



Graph 5.4 amalgamates these two graphs and adds the proportion of respondents who engage in each activity less often than once a week. This graph shows that some activities, such as *keeping pets, gaining access, hanging washing out* and *children's play*, tend to be done often or not at all. Others, such as *sitting and relaxing, gardening* and *talking to neighbours*, are

done less often than once a week by 20% or more of respondents. So overall these activities are undertaken by 70% to 80% of respondents in their residential outdoor space. *Eating outside* and *entertaining visitors* are done by 35% and 49% of respondents respectively, less often than once a week, indicating that these are popular but less frequent activities.

Graph 5.4



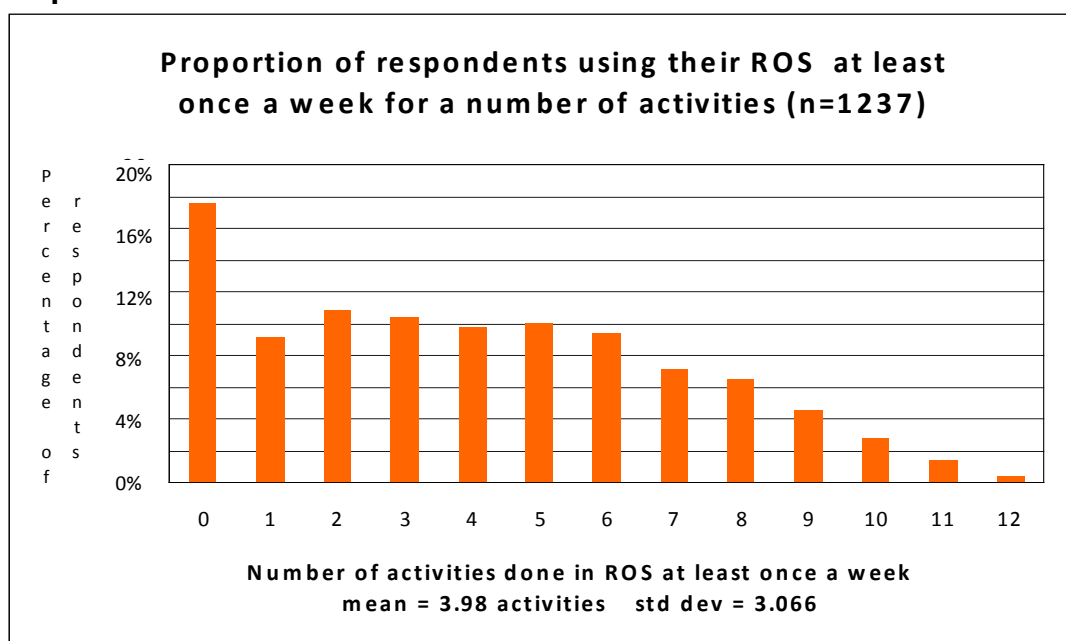
Activities undertaken by more than half the sample are listed in Table 5.1 in order of number of respondents engaging in each activity. Apart from *enjoying wildlife* (52%) all the activities listed in Table 5.1 are engaged in by over two thirds (67% –83%) of respondents. Families with children or pets are in the minority in this sample, but they do make specific use of outdoor space and are considered separately in Section 6.2.4 and Chapter 7.

Table 5.1 Activities in descending order of number of respondents engaging in each activity (n=1237)

In descending order of number of respondents doing this activity in their ROS	In descending order of numbers of respondents doing this activity in their ROS at least once a week	In descending order of numbers of respondents doing this activity in their ROS less often than once a week
Sitting and relaxing	Hanging washing out	Entertaining visitors
Talking to neighbours	Sitting and relaxing	Eating outside
Entertaining visitors	Gardening	Talking to neighbours
Gardening	Talking to neighbours	Gardening
Hanging washing out	Enjoying wildlife	Sitting and relaxing
Eating outside	Eating outside	Enjoying wildlife
Enjoying wildlife	Entertaining visitors	Hanging washing out

Respondents differ in how many different activities they do regularly in their residential outdoor space. Graph 5.5 indicates the number of different activities engaged in by respondents at least once a week and shows that 18% of those who answered this question do not use their residential outdoor space this often for any activity.

Graph 5.5



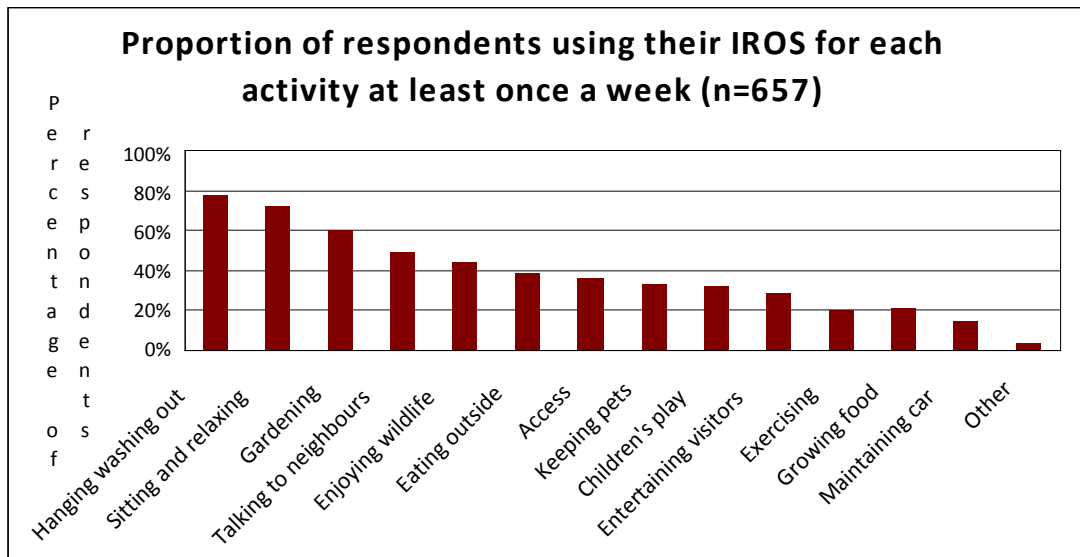
This means that 82% of respondents do use their residential outdoor space at least once a week in warmer months. The distribution shown in Graph 5.5 is flat between one and six different activities, with a mean number of activities close to four, and tails off gradually. This mean level of four different activities is used throughout the analysis to represent a good level of usage of residential outdoor space. As shown in Section 5.2.1.2, (Graph 5.12), this level of usage is shown by 71% of those respondents who have individual ROS only.

5.2.1.2 Comparison of usage of residential outdoor space by respondents in each set

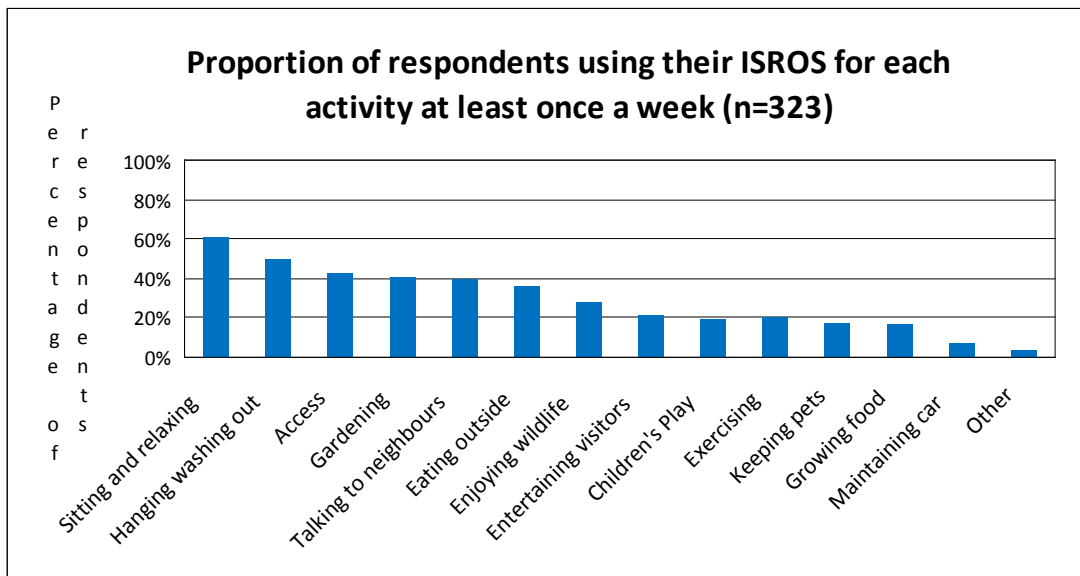
Graphs 5.6 to 5.8 show the percentage of respondents who do each activity at least once a week, for each of the sets of respondents (IROS, ISROS and SROS) defined at the beginning of Section 5.2.

Graphs 5.6 IROS – individual residential outdoor space only and 5.7 ISROS – individual and shared residential outdoor space, exhibit distributions similar to that of the whole sample (Graph 5.2). The IROS set of respondents has a higher proportion of members doing most of the activities than the whole sample. Increases range from 2% of the IROS sample (*exercising*) to a significant increase of 17% (*hanging washing out*). *Talking to neighbours*, *children's play*, *exercising* and *car maintenance* show smaller differences (2%-5%) from the whole sample than other activities. The only exception is *access*, which is a use made by 3% fewer respondents in this set. The order of the activities is similar to that in the whole sample, the only changes being that *access* has moved down the scale and *keeping pets* and *children's play* have changed places. This set represents more than half the whole sample, so is expected to have the most impact on the results for the whole sample.

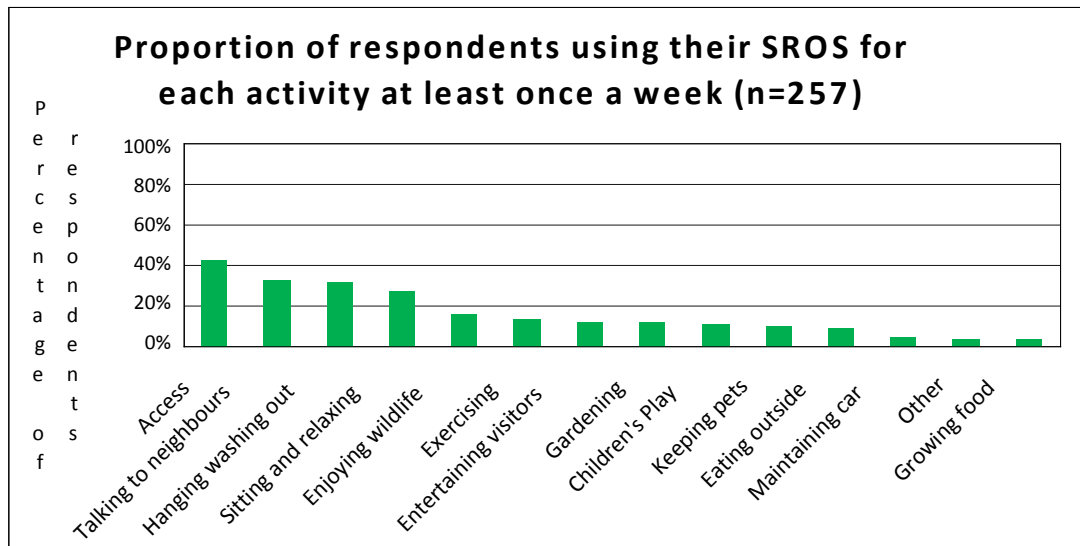
Graph 5.6



Graph 5.7



Graph 5.8



Respondents who have individual and shared residential outdoor space (Graph 5.7, ISROS) show increases in usage compared to the whole sample of between 1% (*sitting and relaxing, growing food and exercising*) and 4% (*access and eating outside*) for some activities. Other activities show decreases, ranging from 2% (*entertaining visitors*) to 11% (*hanging washing out*), in the number of respondents doing these activities at least once a week. The order has changed, with a significant decrease in the proportion of respondents *hanging washing out* from 61% to 50% (78% in the IROS set) making this less frequent than *sitting and relaxing*. Most other changes in order are between activities at very similar levels and are therefore not significant.

Less than a third (33%) of respondents who only have shared ROS (the SROS set) engage in any activity at least once a week, apart from gaining *access*, which 43% do (an increase of 4% over the whole sample).

Decreases in the proportion of respondents engaging in each activity, compared to the whole sample, range from 5% (*exercising*) to 33% (*sitting and relaxing*). The three activities engaged in, at least once a week, by the most residents with shared outdoor space only, are: *talking to neighbours* (33%); *hanging washing out* (32%) and *sitting and relaxing* (27%). *Gardening* (12%) is done regularly by fewer residents with shared residential outdoor space only than by residents who have their own individual outdoor space.

Some reductions in activity of those who have shared ROS may be due to prohibitive covenants or conditions in leases. For example *hanging washing out* or the *keeping of pets*. Respondents were not asked about covenants or restrictions in the questionnaire. 11 respondents (5 in the SROS set and 6 in

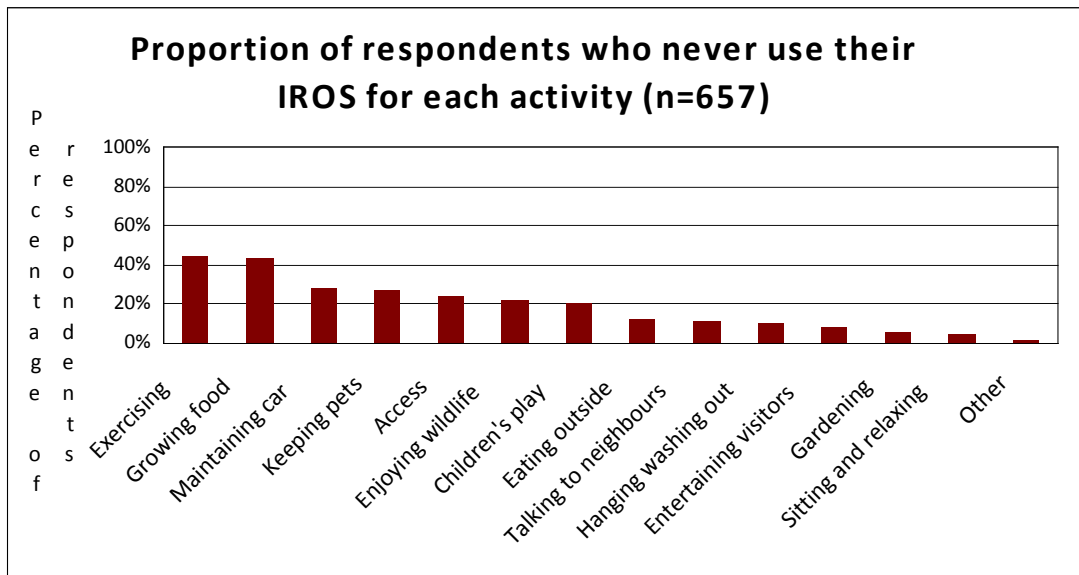
the ISROS set) said in answer to Question A5 (What would you change about your outdoor space if you could?), that they would like to be “allowed” or “able” to *hang washing out*. This suggests that that they either lack facilities for hanging washing or are prohibited from doing so. Respondents were not asked in the questionnaire about facilities nor covenants and all the interviewees had areas provided for hanging washing. So the impact of covenants on hanging washing out or any other usage cannot be further explored in this study.

Table 5.2 compares the proportion of respondents engaged in each activity in the three sets and the whole sample.

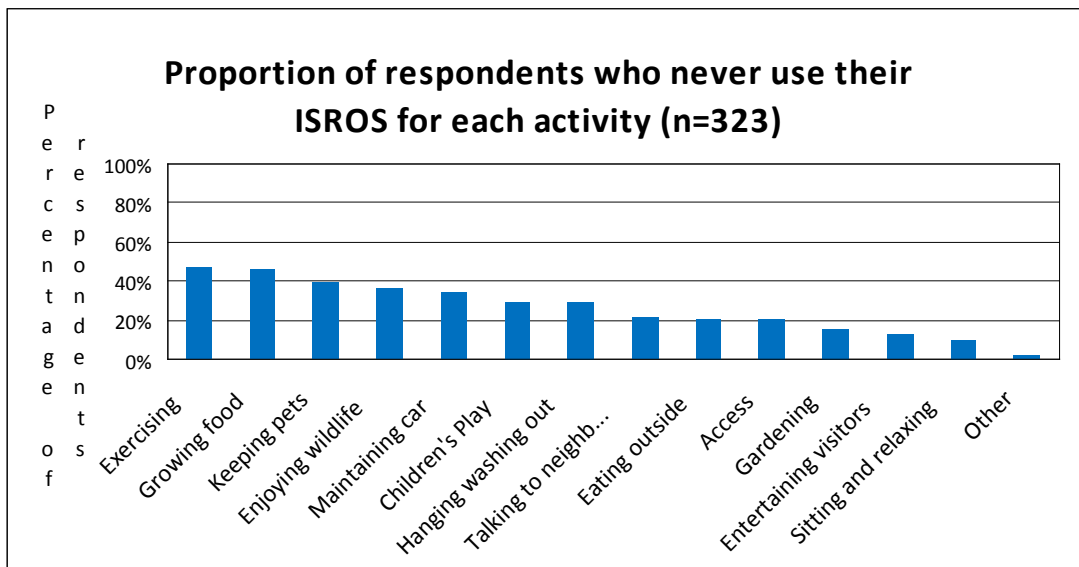
Table 5.2 Proportion of respondents engaging in each activity at least once a week in the warmer months (n=1237)

Activity	IROS Individual only	SROS Shared only	IROS – SROS difference	ISROS Individual & shared	IROS – ISROS difference	ROS Whole sample
Hanging washing out	78%	32%	46%	50%	28%	61%
Sitting and relaxing	72%	27%	45%	61%	27%	60%
Gardening	60%	12%	48%	41%	19%	45%
Talking to neighbours	49%	33%	16%	40%	9%	44%
Access	36%	43%	-7%	43%	-7%	39%
Enjoying wildlife	44%	16%	28%	28%	16%	34%
Eating outside	39%	9%	30%	36%	3%	32%
Children's Play	32%	11%	21%	20%	12%	25%
Keeping pets	33%	10%	23%	18%	15%	24%
Entertaining visitors	29%	12%	17%	22%	7%	24%
Exercising	21%	14%	7%	20%	1%	19%
Growing food	21%	3%	18%	17%	4%	16%
Maintaining car	15%	5%	10%	8%	7%	11%
Other	4%	4%	0%	4%	0%	4%
Number of responses	657	257		323		1237

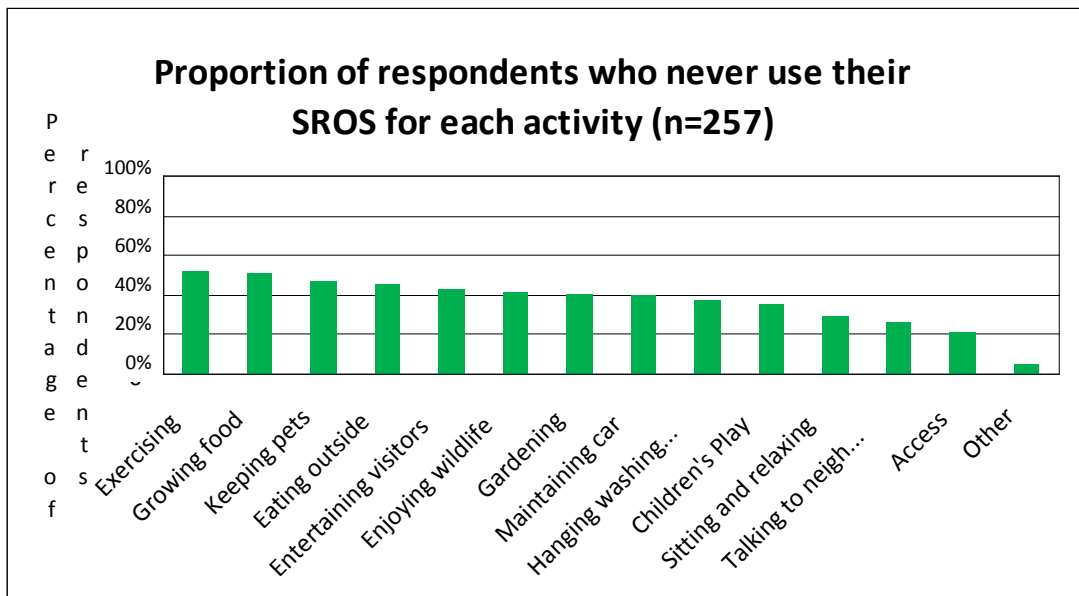
Graph 5.9



Graph 5.10



Graph 5.11

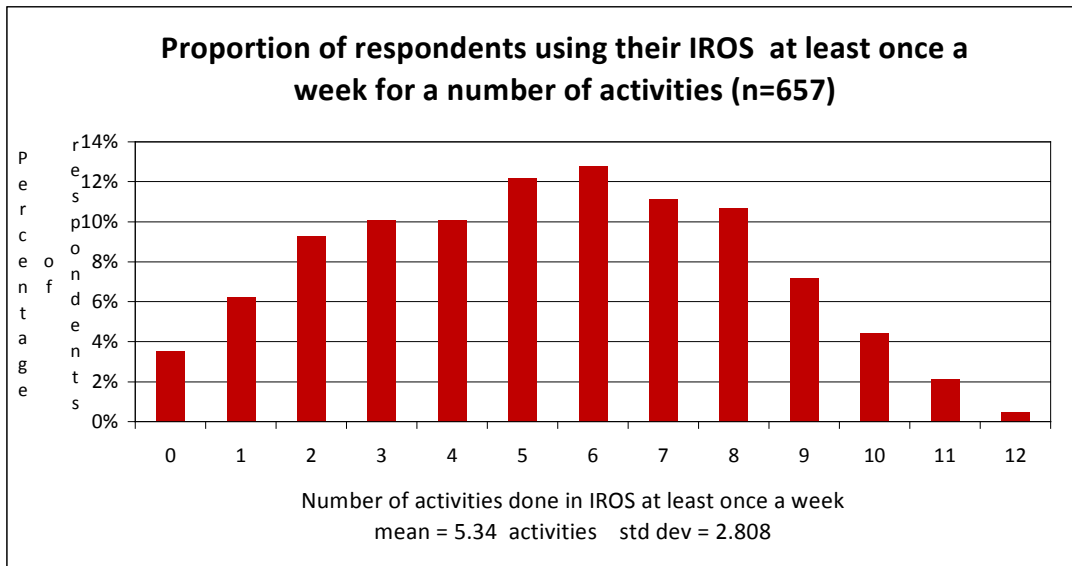


It is clear that compared with those who have access to some individual residential outdoor space (IROS and ISROS), respondents with access to shared space only (SROS) are less likely to use that space regularly for any activity apart from *access*. This is confirmed by the number of respondents who never use their residential outdoor space (Graphs 5.9 to 5.11).

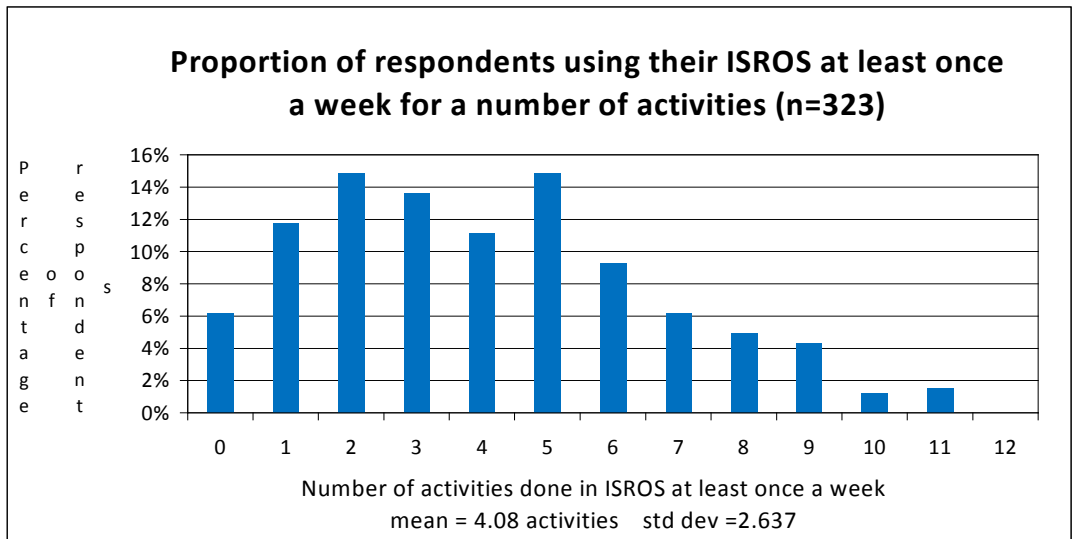
The distribution is flatter for respondents in the SROS set (Graph 5.11) than for those in the other two sets (Graphs 5.9 and 5.10). The differences in proportions of respondents who never do less popular activities such as *exercising* (45% IROS, 47% ISROS, 52% SROS) and *growing food* (44% IROS, 46% ISROS, 51% SROS) in their residential outdoor space, are only 7% between the IROS and SROS sets.

This difference increases as activities become more popular, mainly due to a substantial rise in the number of those with shared space only who never do them. For example, 46% of those with shared space only, and 13% of those with individual outdoor space only, never *eat outside*, a difference of 33%. Differences of similar magnitudes are found for *gardening* (35%), *entertaining visitors* (33%), *hanging washing out* (29%) and *sitting and relaxing* (25%). Further corroboration that respondents who only have access to shared residential outdoor space are less active in it and therefore use it less than those who have some individual space, is gained from comparing the number of different activities that respondents do in their outdoor space. These are shown in Graphs 5.12 to 5.14.

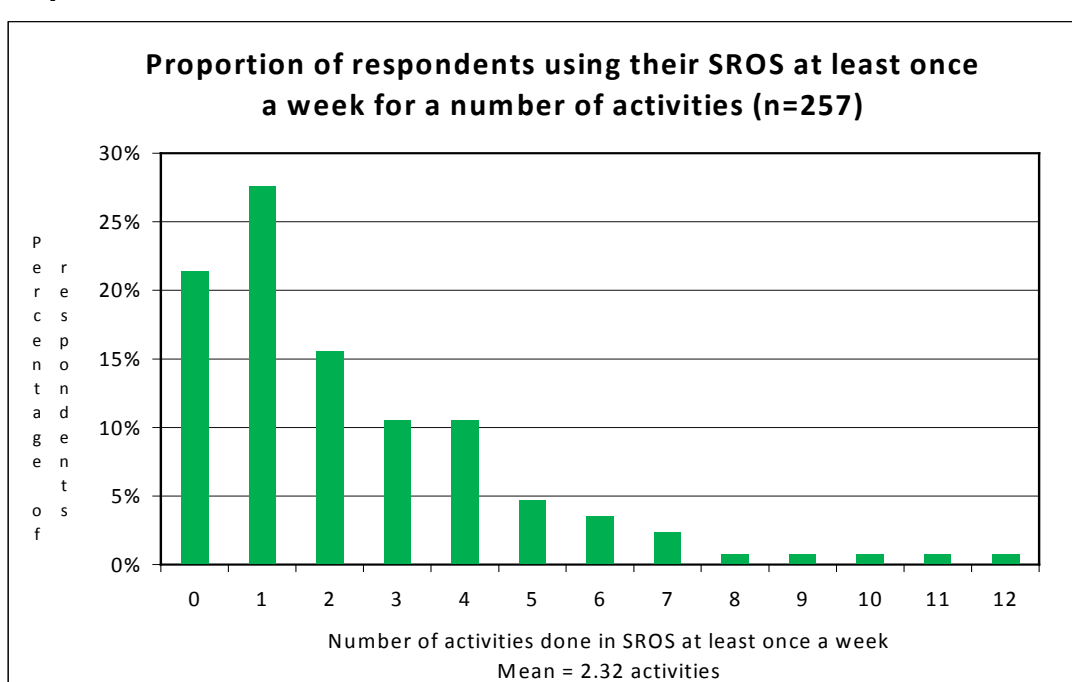
Graph 5.12



Graph 5.13



Graph 5.14



About 5% of those respondents with some individual residential outdoor space do none of these activities in their ROS, as often as once a week, whereas 21% of those who have access to shared space only, are in this situation. The mean number of activities done in their outdoor space in the IROS set is 5.34, for the ISROS set 4.08 and 2.32 in the SROS set. Only 23% of respondents in the SROS set do more than four or more activities at least once a week in their outdoor space (ISROS = 54%, IROS = 71%).

An attempt was made to differentiate between activities done by respondents in the ISROS set in their individual and in their shared, residential outdoor spaces. All respondents were asked to tick a box against any activity that they did in shared space.

31 respondents (4.7%) from the IROS set (who have no shared space), ticked this box. Two of these respondents from the IROS set ticked the box for all activities: inspection confirmed that they were each living in a single house with its own garden, so it is assumed that this was an error (perhaps due to interpreting 'shared' as meaning with other members of the household). The other 29 ticked the shared space box for specific activities which are often done in the street or other area just outside the dwelling's private space. These activities are summarised in Table 5.3 together with some possible explanations.

All of these activities may be taking place in what Coleman calls 'confused space' (2003). This is space that may not be privately owned by residents or landlords, but is viewed as belonging to the dwellings or group of dwellings. Often ownership is unclear. Examples of this are discussed in Chapter 7.

Table 5.3 Activities described as being done in shared space by respondents in the IROS set

Activity	Number of respondents ticking shared space	Possible explanations
As an access route	11	Shared path to front doors Shared drive
Maintaining your car	9	Done in road or lay-by or parking area adjacent to dwelling
Talking to neighbours	8	Done immediately outside own space or in the neighbour's space
Exercising	6	Done in shared green space e.g. green around which dwellings are arranged
Children's play space	6	The street or area in front of dwellings A shared playground or green
Keeping pets	3	Cats and dogs recognise no boundaries
Entertaining visitors	1	?
Hanging washing out	1	Communal drying area Lines across the street

113 out of 257 respondents with shared outdoor space only (SROS set), did not always tick the shared space box. 88 (34%) of these did not tick the box for any of the activities that they listed. Most of these live in developments where it is clear, from responses of other residents and from the desktop study, that all the space is shared. It appears that a third of this set did not answer this question accurately either through confusion about what they were being asked to do or simple omission.

The remaining 25 respondents ticked the shared space box for some activities, but not others. Table 5.4 lists the specific activities for which this box was not ticked and some possible explanations. There is no way of knowing if these are errors or activities that are done outside through open windows and doors.

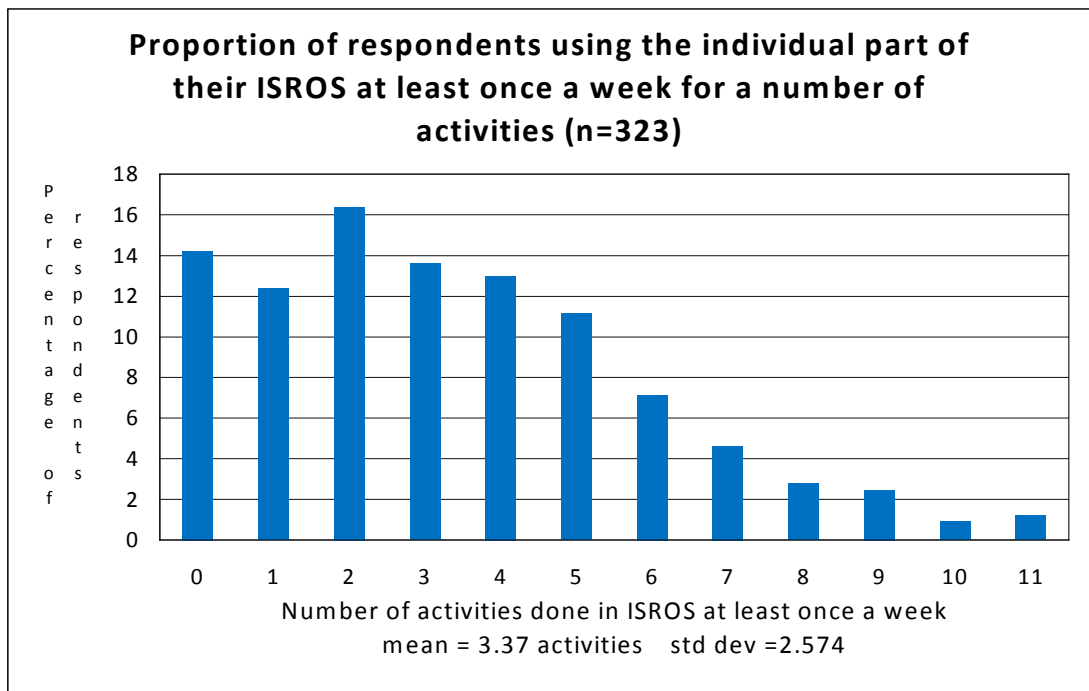
Table 5.4 Activities described as being done in individual space by respondents in the SROS set

Activity	Number of respondents not ticking shared space	Possible explanations
Talking to neighbours	8	Through an open window or door
Access	7	Individual path to entrance through shared space, perceived as own path
Sitting and relaxing	7	Invited into neighbour's space, therefore not own individual space nor shared
Hanging washing out	7	Pulley system from window
Exercising	6	
Children's play	4	In neighbour's space
Entertaining visitors	3	
Feeding or enjoying wildlife	3	Through a window
Eating outside	2	
Other	2	
Keeping pets	1	Hanging a bird or rodent cage outside
Gardening	1	On window sills or in window boxes
Growing food	1	On window sills or in window boxes

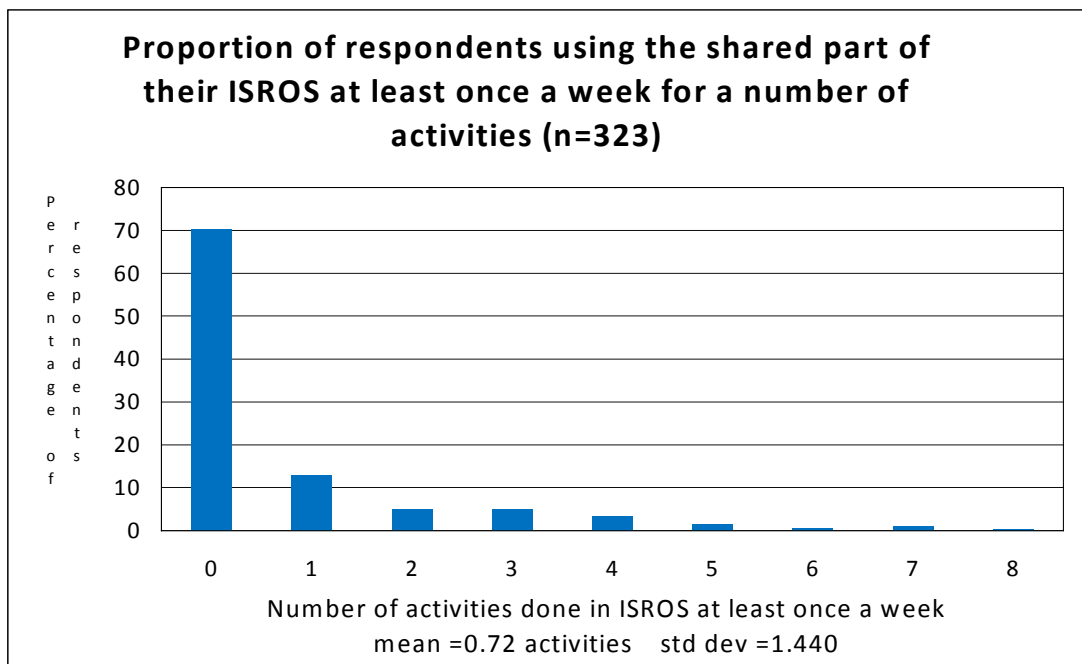
Respondents in the ISROS set list considerably more activities as taking place in their individual ROS than in shared ROS, as shown in Graphs 5.15 and 5.16. 86% of these respondents list activities in their individual space and 30% list activities taking place in their shared space.

As when comparing the number of different activities done at least once a week in the IROS and SROS sets, more respondents are doing a larger number of activities in their individual than in their shared space. Of the 277 respondents in the ISROS set who report activity in their individual space, 207 (64% of the ISROS set) report activity at least once a week in their individual space, but none in their shared space. The high rate of omitting to tick the shared space boxes in the SROS set, however, casts some doubt on these differences.

Graph 5.15

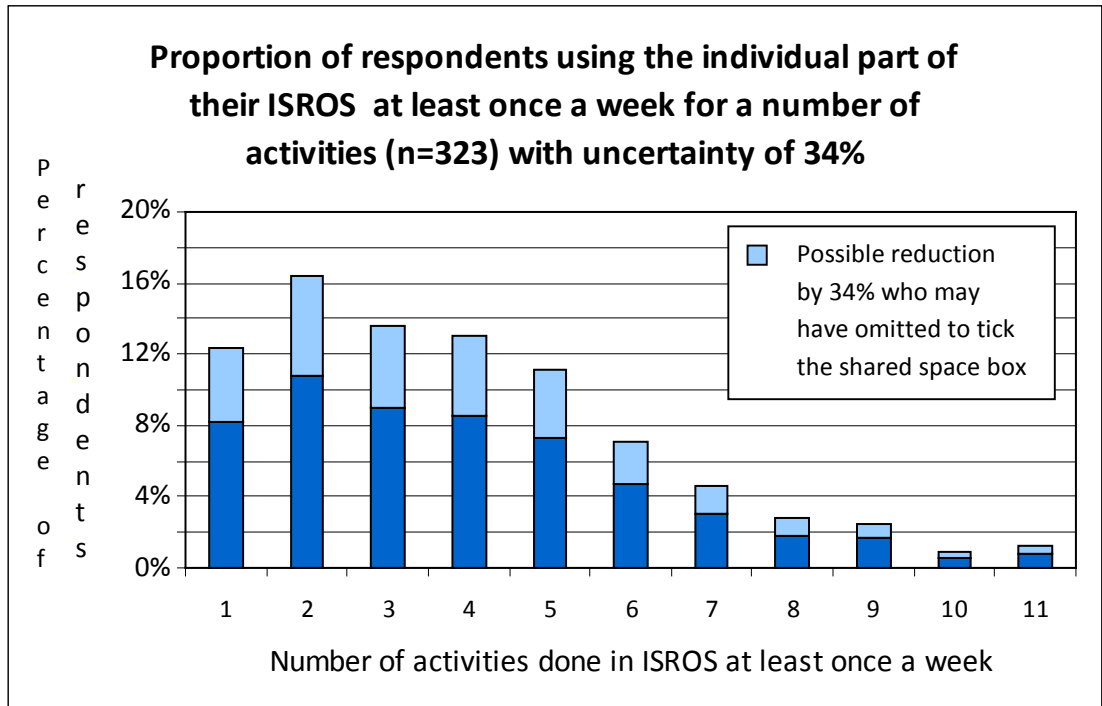


Graph 5.16

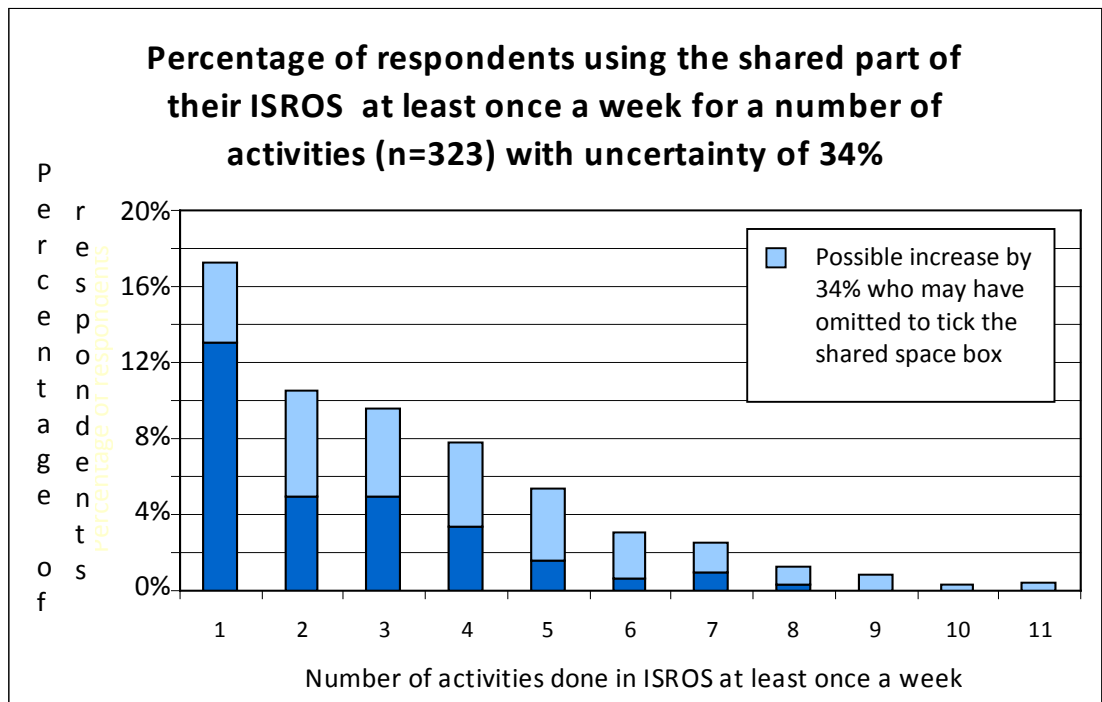


One third of the SROS set omitted to tick the shared space box. If there is a similar rate of omission in the ISROS set then about $64\% - 22\% = 42\%$ are correctly reporting that their activity is concentrated in their individual space. Graphs 5.17 and 5.18 show the impact of this order of error on the distributions given in Graphs 5.15 and 5.16 (omitting data for 0 activities).

Graph 5.17



Graph 5.18



As these graphs show, if such a high rate of omission in ticking shared space has happened in the ISROS set, then there is no difference shown in the use of individual compared to shared ROS, by respondents who report doing

between two and four activities in their ROS at least once a week. The numbers of respondents reporting higher numbers of activities are, however, still lower in shared compared to individual ROS. 17% of respondents are doing only one activity this often in shared space, half as many again (12 %) as reported in the individual outdoor space. The proportion of respondents doing no activity in each type of space is similar at 43%.

The activities reported as being done in shared space by those in the ISROS set are summarised in Table 5.5.

Table 5.5 Activities described as being done in shared space by respondents in the ISROS set (n=323)

Activity	Number of respondents ticking shared space (Shar)		Number of respondents not ticking shared space (Ind)		Percentage of respondents assuming 34% error	
					Shar	Ind
As an access route	55	17%	168	52%	34%	34%
Talking to neighbours	40	12%	263	81%	39%	54%
Sitting and relaxing	27	8%	284	88%	37%	59%
Children's play space	26	8%	162	50%	25%	34%
Exercising	16	5%	241	75%	30%	50%
Feed/enjoying wildlife	13	4%	264	82%	31%	55%
Eating outside	13	4%	282	87%	33%	58%
Gardening	10	3%	264	82%	30%	55%
Entertaining visitors	9	3%	292	90%	33%	57%
Hanging washing out	8	2%	286	89%	32%	59%
Keeping pets	5	2%	181	56%	21%	37%
Growing own food	3	1%	240	74%	26%	48%
Other	3	1%	22	7%	3%	5%
Maintaining your car	2	1%	230	71%	25%	47%

There is no way of knowing how accurate these figures are, but it is possible that respondents with both types of space are more likely to be paying attention to the differences between them than those with shared space only.

Thus the level of error may be lower in the ISROS set than in the SROS set and is assumed to be no higher.

Even if the error rate is as high as 34% it is still clear that those with both individual and shared residential outdoor space are more likely to do things in their individual ROS than in their shared ROS. This is compatible with the findings that respondents with individual residential outdoor space do more different activities in it than those with access to shared residential outdoor space only.

Comparison between the three sets shows that those with access to shared residential outdoor space only, are less likely to engage in any activity in their ROS than those with access to some individual residential outdoor space. Most respondents who do use their shared residential outdoor space at least once a week engage in a narrower range of activities than those who use their individual residential outdoor space this often.

5.3 Actual use of private, shared residential space compared to what respondents would like to do

Having established that respondents with access to shared residential outdoor space only use it less than those with some individual ROS, the following research question is explored further:

- Do residents of housing developments in which only shared, private residential outdoor space is provided, use that space in the way that they would like?

Responses to the written questionnaire provide several sources of information relating to this research question.

Firstly, respondents were asked to what extent they agreed with the statement 'I am able to do everything I would like to do in this space' (question A8).

Secondly, respondents were asked to rank the purposes of their ideal outdoor space (question A11). Comparison of responses to this question in each set shows any differences between expectations. Also comparing respondents' answers with their actual usage (question A6) gives some indication of whether they are able to do what they wish to do in their outdoor space.

Thirdly, a comparison of satisfaction with their residential outdoor space (question A3) with their usage of it (question A6) examines whether satisfaction is related to being able to do what one wants or to frequency of use alone.

Fourthly, some of the responses to the open questions (A4 and A5) indicate to what extent respondents can use their residential outdoor space as they wish.

5.3.1 Responses to the statement 'I am able to do everything I would like to do in this space' (A8)

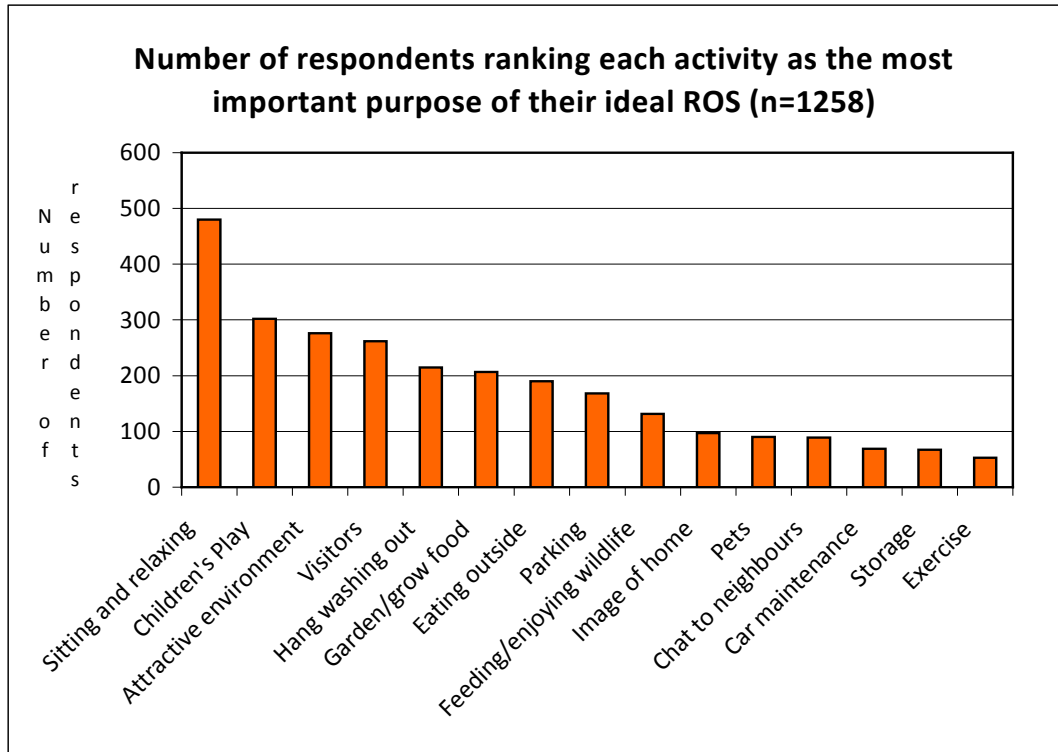
24% of respondents with shared ROS only, agreed with this statement. Of those with some individual outdoor space as well, 38% agreed, while 55% of those with individual residential outdoor space only, agreed. More respondents feel able to use their residential outdoor space as they wish where they are not sharing it with others.

5.3.2 Respondents' views on the most important purposes of residential outdoor space (A11)

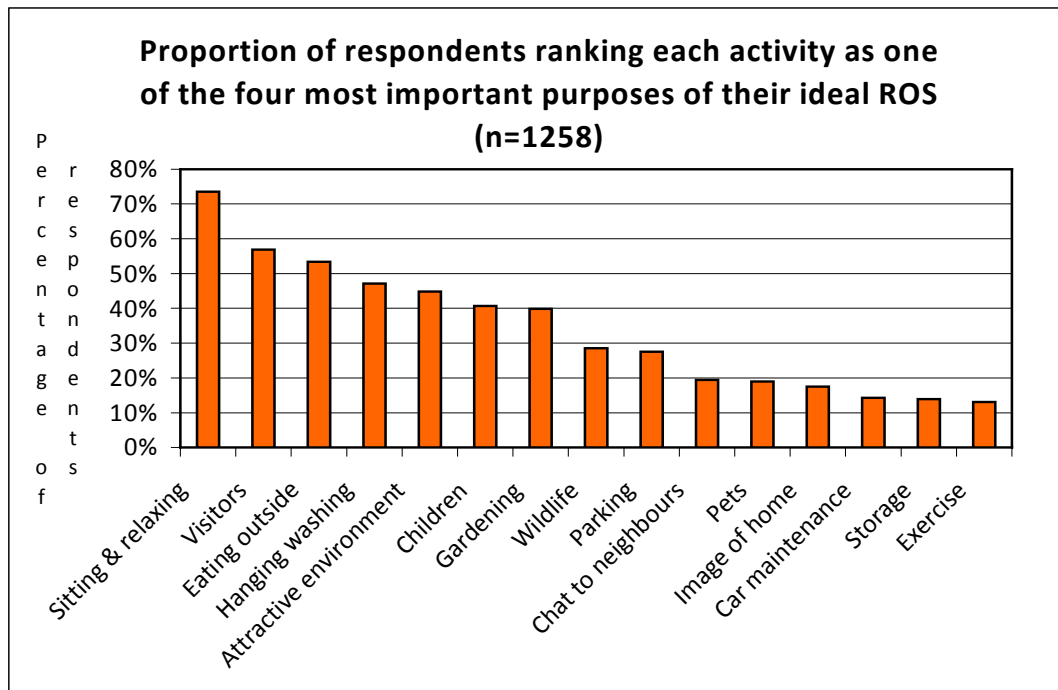
Respondents were offered a list of fifteen uses and asked to rank them in their order of importance as purposes of their ideal residential outdoor space.

1276 respondents answered the question. The number of respondents from the whole sample who ranked each activity as most important is shown in Graph 5.19.

Graph 5.19



Graph 5.20



Some respondents ranked more than one activity as most important. *Sitting and relaxing* is considered most important by 480 (38%) of the respondents.

Graph 5.20 shows the proportion of respondents ranking each activity in the top four.

Table 5.6 compares the order of importance given by these two criteria (Graphs 5.19 and 5.20) with the numbers of respondents engaging with the activity at least once a week (Graphs 5.2 and 5.4).

Table 5.6 Comparison of the ranking of purposes of their ideal ROS with the numbers of respondents engaging in them at least once a week

Order of importance as measured by ranking in first place	Order of importance as measured by ranking in first four places	Order of number of respondents engaging in each activity at least weekly
Sitting and relaxing	Sitting and relaxing	Hanging washing out
Children's play	Entertaining visitors	Sitting and relaxing
Attractive environment	Eating outside	Gardening
Entertaining visitors	Hanging washing out	Talking to neighbours
Hanging washing out	Attractive environment	Access
Gardening and/or growing food	Children's play	Feeding or enjoying wildlife
Eating outside	Gardening and/or growing food	Eating outside
Parking	Feeding or enjoying wildlife	Children's play
Feeding or enjoying wildlife	Parking	Keeping pets
Image of home	Talking to neighbours	Entertaining visitors
Keeping pets	Keeping pets	Exercising
Talking to neighbours	Image of home	Growing food
Maintaining car	Maintaining car	Maintaining car
Storage	Storage	Other
Exercising	Exercising	

The popular activity of *sitting and relaxing* is considered important by nearly three-quarters (938) of the respondents. *Entertaining visitors* and *eating outside*, whilst being done at least weekly by only 20% and 30% of the

sample respectively, are considered to be important purposes of residential outdoor space by more than half of them. Space for *childrens play* is of primary importance to those who frequently use their space for this purpose. Activities such as *hanging out washing, gardening and talking to neighbours* are considered to be of high importance by fewer respondents than are doing them frequently. This suggests that for some respondents the first two are chores rather than activities associated with their ideal residential outdoor space and *talking to neighbours* is an incidental activity rather than a purpose of the space. *Talking to neighbours* is ranked in the top four by only 20% of the respondents, but is a frequent activity for over half of them.

Tables 5.7 and 5.8 show the ranking of activities for each set separately in the order of importance for the whole sample.

Table 5.7 Proportion of respondents in each set ranking activities as most important in their ideal ROS (n=1276)

	Whole sample	Shared space only	Shared & individual space	Individual space only	No space
Sitting and relaxing	38%	45%	35%	36%	33%
Children's play	24%	21%	19%	28%	8%
Attractive environment	22%	26%	18%	22%	13%
Entertaining visitors	21%	23%	19%	20%	13%
Hanging washing out	17%	21%	10%	19%	0%
Gardening/grow food	16%	17%	13%	18%	4%
Eating outside	15%	18%	14%	14%	13%
Parking	13%	18%	11%	12%	21%
Feeding/enjoying wildlife	10%	15%	7%	10%	0%
Image of home	8%	9%	5%	9%	0%
Keeping pets	7%	7%	4%	9%	4%
Talking to neighbours	7%	14%	4%	6%	0%
Car maintenance	5%	8%	3%	6%	0%
Storage	5%	8%	3%	5%	0%
Exercise	4%	9%	2%	4%	0%
Number of responses	1276	269	328	655	24

Table 5.7 shows that respondents from different sets have similar views on what the most importance purposes of residential outdoor space are. Where the order of importance changes, it is only by a few percentage points. The most striking variation is that those respondents who have no access to residential outdoor space list a smaller range of preferred activities and *parking* is ranked first by more of them than any activity apart from *sitting and relaxing*. This may reflect the difficulties of finding parking spaces on urban streets and suggests that parking is not seen as so important by those who have residential parking space.

A higher proportion of respondents with shared ROS only rate *sitting & relaxing, hanging washing out, having an attractive environment, parking, wildlife* and *talking to neighbours* as of prime importance, compared to those with some individual ROS. The only function which substantially fewer respondents with some shared space (SROS and ISROS) rated first is space for *children's play*. As explained in Section 6.2.4 this is because fewer respondents in these sets have resident or visiting children using the space.

Table 5.8 summarises the activities ranked in the top four places by respondents in each set. This ranking shows general agreement across the sets, except that fewer respondents with no residential outdoor space rank social activities such as *entertaining visitors* and *talking to neighbours*, environmental purposes such as an *attractive environment*, image of the home and *enjoying wildlife* or practical activities such as *hanging washing out*, as highly as other respondents.

Table 5.8 Proportion of respondents in each set ranking activities as one of the top four most important (n=1276)

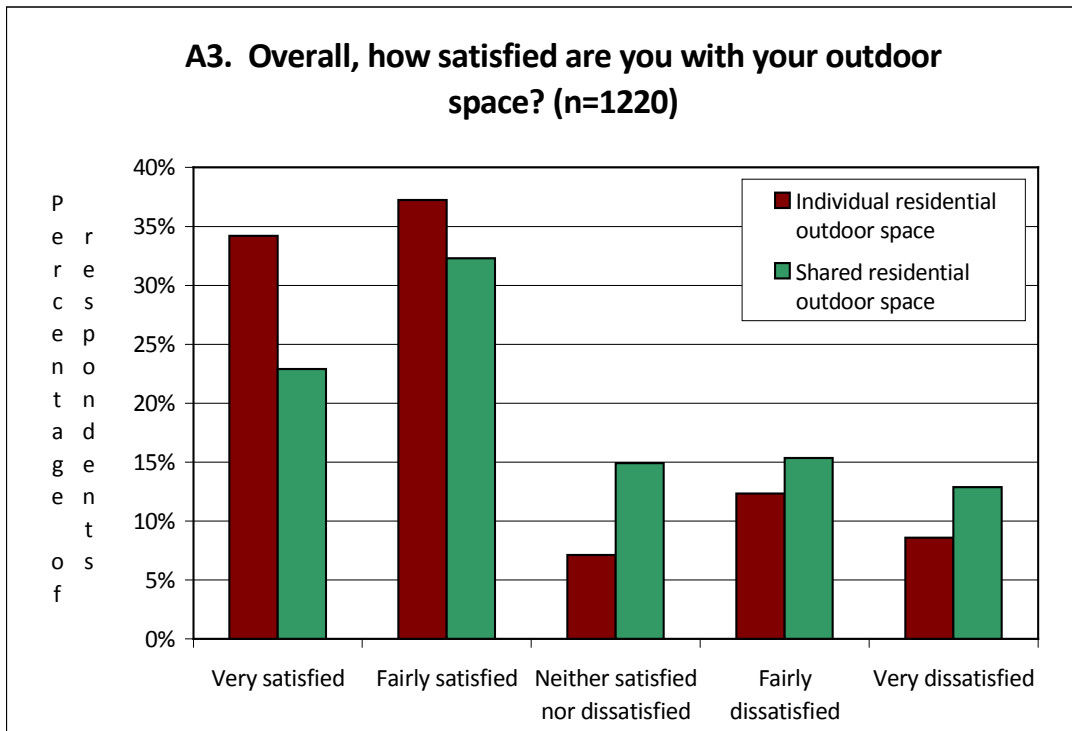
	whole sample	shared only	individual & shared	individual only	no space
Sitting & relaxing	74%	75%	77%	71%	75%
Entertaining visitors	57%	54%	62%	56%	38%
Eating outside	53%	53%	58%	51%	54%
Hanging washing	47%	45%	36%	54%	38%
Attractive environment	45%	48%	45%	44%	25%
Children's play	41%	36%	36%	46%	17%
Gardening/growing food	40%	38%	39%	42%	38%
Feeding/enjoying wildlife	29%	31%	24%	30%	17%
Parking	28%	33%	21%	28%	21%
Talking to neighbours	19%	25%	15%	19%	8%
Keeping pets	19%	18%	16%	21%	13%
Image of home	17%	17%	14%	20%	13%
Car maintenance	14%	16%	11%	15%	13%
Storage	14%	16%	11%	15%	8%
Exercise	13%	18%	8%	14%	4%

There is nothing in these data to suggest that respondents with access to shared residential outdoor space only have different aspirations about the purposes of their ideal residential outdoor space than respondents with access to some individual space. Those with no outdoor space do, however, show less variation in what they consider most important, though this is possibly because the sample size is an order of magnitude smaller.

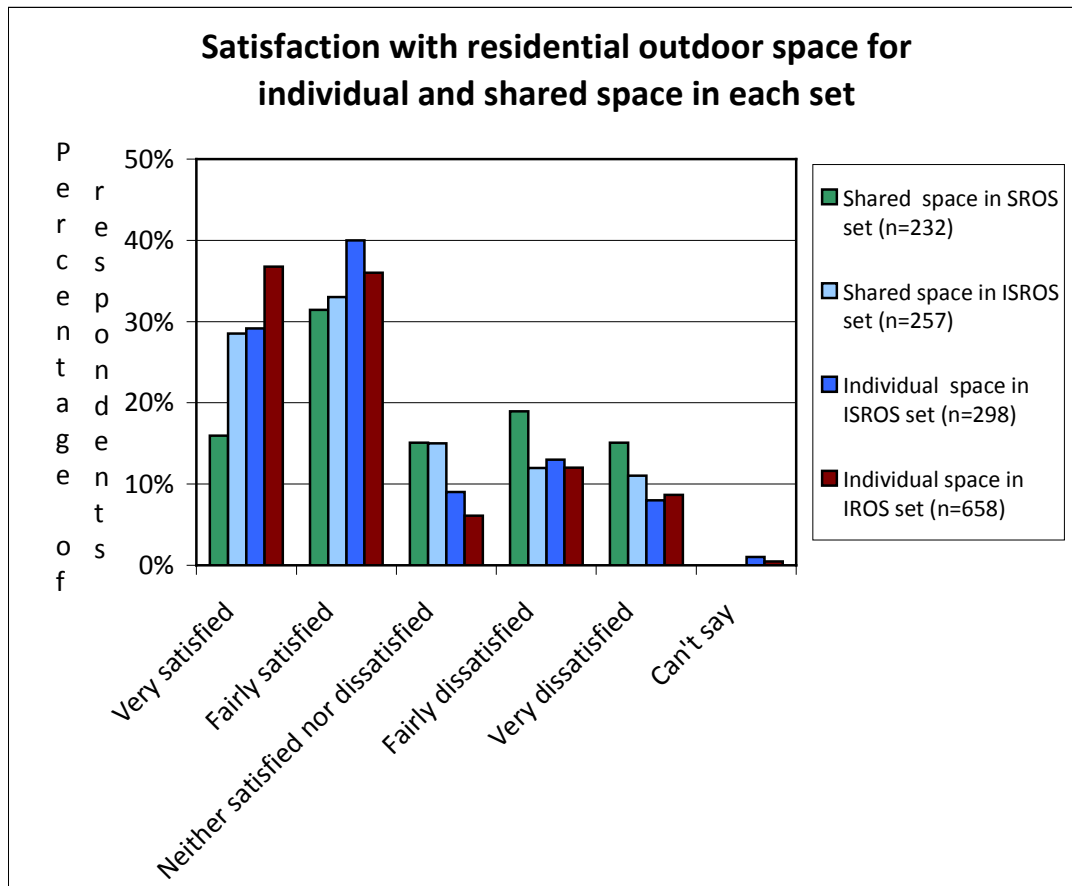
5.3.3 Variation of satisfaction with usage

Respondents were asked how satisfied they were with their outdoor space (question A3) on a five point scale (very dissatisfied to very satisfied) plus a 'can't say' option. 72% (683) of those with individual and 55% (270) of those with shared residential outdoor space are fairly or very satisfied with it. The distributions are shown for the whole sample in Graph 5.21 and for each set in Graph 5.22.

Graph 5.21



Graph 5.22



Graph 5.22 shows that fewer of those with shared space only (SROS) are satisfied with their shared outdoor space than those with some individual residential outdoor space (ISROS). This may be due to the quality of different spaces or it may suggest that having some individual space satisfies needs that cannot be provided by shared space alone.

Inspection of cross-tabulations of frequency of doing each activity with satisfaction with shared ROS (Appendix 5.1) show that, for almost all activities, fewer of those respondents who never engage in it are fairly or very satisfied with their shared outdoor space, compared to those who do the activity sometimes. It cannot be said if lack of engagement with the space is because of dissatisfaction or is the cause of the dissatisfaction. This effect is especially strong (a fall > 20%) for *entertaining visitors* and *sitting and relaxing*. This is compatible with the finding that the majority of respondents rank these activities in the top four purposes of their ideal outdoor space. Respondents who use their space for *children's play*, *talking with neighbours* and *enjoying wildlife* at least once a week show higher levels of satisfaction than those who engage in these activities less frequently. Those who engage in *hanging washing out*, *gardening*, *growing food* and *car maintenance* most frequently are less likely to be satisfied than those who engage in these activities less often. This suggests that these more utilitarian activities may become burdensome or that engaging in them frequently highlights the shortcomings of the space. The highest levels of satisfaction are displayed by those who *entertain visitors* in their shared residential outdoor space (80% are fairly or very satisfied), though this represents only 2% of those with shared space.

These links between satisfaction and levels of usage do suggest that reduced levels of the popular activity *sitting and relaxing* in shared ROS are not because residents do not want to do this activity but are, at least in part, because the space does not appear suitable to them for this activity.

5.3.4 Comments written on the questionnaire

1118 (84%) respondents wrote their own comments in response to the open questions A4 and A5 and 213 (16%) wrote in the spaces provided for further comment. The SROS set had a smaller proportion of respondents writing comments (75%) than the ISROS (88%) and IROS (89%) sets. As these questions were asked early in the questionnaire they arguably give a good representation of what was brought to respondents' minds when they were asked to think about their residential outdoor space. The factors commented on most frequently were the size of the residential outdoor space (30%) and the amount of privacy that it affords (28%). 7% of those commenting liked the size of their residential outdoor space, 22% would have liked a larger space and 16 people wanted a smaller space (usually because it would be easier to manage). 19% of the whole sample (but only 6% of the SROS set) liked the privacy of their residential outdoor space and that it was hardly or not overlooked. Another 9% wanted it to be less overlooked.

5.3.4.1 Responses to the question 'What do you like most about your outdoor space?'

1039 (78%) of respondents answered this question. 43 of them said that there was nothing that they liked about their residential outdoor space; 28 of these had access to shared space only. Table 5.9 summarises the most frequently represented themes of answers to this question (A4).

Table 5.9 Frequency of themes from the responses to A4. ‘What do you like most about your outdoor space?’ for the different sets

	IROS	ISROS	SROS	NROS	TOTAL
Total no. of questionnaires	678	332	293	25	1328
Total no. with written comments	598	296	217	4	1115
Total no. answering A4	572	280	187	0	1039
% answering A4	84%	84%	64%	0%	84%
It is private/not overlooked	144 25%	59 20%	13 6%		216 21%
Being outside (mainly sitting)	81 14%	39 13%	17 8%		137 13%
The planting (mainly variety)	74 13%	44 15%	18 8%		136 13%
Trees (especially mature ones)	44 8%	37 13%	26 12%		107 10%
The view	36 6%	48 16%	14 6%		98 9%
Having space (between buildings)	52 9%	22 7%	14 6%		88 8%
It is suitable for children	59 10%	20 7%	6 3%		85 8%
The size	53 9%	23 8%	8 4%		84 8%
It is easy to maintain/well maintained	31 5%	34 11%	13 6%		78 8%
That it is my own	51 9%	19 6%	2 1%		72 7%
The greenery	26 5%	30 10%	14 6%		70 7%
Enjoying sunshine	42 7%	22 7%	6 3%		70 7%
Opportunity to garden	43 8%	21 7%	5 2%		69 7%
Peace and quiet	42 7%	17 6%	7 3%		66 6%
Fresh air	32 6%	14 5%	10 5%		56 5%
The grass or lawn	34 6%	10 3%	12 5%		56 5%
To enjoy wildlife	35 6%	13 4%	7 3%		55 5%
The space to relax in	35 6%	13 4%	5 2%		53 5%
That it is attractive/looks nice	22 4%	20 7%	8 4%		50 5%
That it is a secure space	29 5%	17 6%	1 0%		47 5%
The off-road parking	30 5%	7 2%	10 5%		47 4%
Nothing/not much	9 2%	6 2%	28 13%		43 4%
The space to be sociable in	18 3%	18 6%	7 3%		43 4%
Being able to hang washing out	21 4%	14 5%	7 3%		42 4%
The space to grow food	26 5%	12 4%	1 0%		39 4%
Being able to eat outside	15 3%	11 4%	3 1%		29 3%

Most activities listed in this table are less likely to be commented on by those who have access to shared space only, than by those who have access to some individual residential outdoor space. The responses to this question give some clues as to why this might be. Those in this set are less likely to comment favourably on the size, privacy, attractiveness, planting or suitability for children of their residential outdoor space, than those with some individual space. 13% of them said that there is nothing that they like about their residential outdoor space, compared to 2% in the other two sets. Only 1 person in this set said that they feel secure in their residential outdoor space.

These comments do suggest that some shared residential outdoor spaces may not provide what residents need to enable and encourage them to use them.

5.3.4.2 Responses to the question ‘What would you change about your outdoor space if you could?’

1026 (77%) of respondents answered this question and the key themes are summarised in Table 5.10. A higher proportion of those with some shared residential outdoor space, would like a greener space, better planting, seating or to be able to hang washing out (not shown in table), compared to those with individual space. This underlines the lack of control that residents have over shared space compared to individual space. 16% of respondents with shared residential outdoor space only, who answered question A5, expressed a wish to have their own outdoor space and 6% of those who have both shared and individual outdoor space want to have their own garden, or (in cases of people living on upper floors) balcony. A quarter of those with individual space would like a larger space. A higher proportion of those with some shared space than of those with individual space only complained about nuisances, particularly

noise from neighbours and traffic. These complaints are centred on a small number of developments, some of which are discussed in Chapter 7.

Table 5.10 Frequency of themes from the responses to A5 ‘What would you change about your outdoor space if you could?’ for the different sets

	IROS	ISROS	SROS	NROS	TOTAL
Total no. of questionnaires	678	332	293	25	1328
Total no. with written comments	598	296	217	4	1115
Total no. answering A5	552	269	203	2	1026
% answering A5	81%	81%	69%	8%	77%
Would like it to be bigger	158 29%	75 28%	19 9%		252 25%
Want to change nothing/not much	85 15%	32 12%	21 10%		138 13%
Would like more privacy/be less overlooked	52 9%	27 10%	17 8%		96 9%
Improve planting	39 7%	19 7%	33 16%		91 9%
Improve landscaping	37 7%	18 7%	7 3%		62 6%
Would like more greenery	7 1%	26 10%	20 10%		53 5%
Improve security or fencing	27 5%	16 6%	8 4%		51 5%
Would like my own outdoor space (or specifically garden or balcony)	0 0%	15 6%	32 16%	2 100%	47 5%
Would like more or some mature trees	20 4%	15 6%	5 2%		40 4%
Would like some or more space to grow food	28 5%	5 2%	6 3%		39 4%
Would like more sun (S or SW aspect/trim trees/remove buildings)	20 4%	13 5%	5 2%		38 4%
Less noise from neighbours, roads or railway	14 3%	3 1%	21 10%		38 4%
Improve design/layout	13 2%	18 7%	7 3%		37 4%
Would like somewhere to sit/seating	7 1%	5 2%	20 10%		32 3%
Would like a (or a better) children’s play area	10 2%	9 3%	10 5%		29 3%
Would like some or more grass	11 2%	12 4%	4 2%		27 3%
Would like to have some or more off-road parking	10 2%	9 3%	8 4%		27 3%
Would like better/easier maintenance	10 2%	7 3%	8 4%		25 2%
Less disturbance from rowdy children / teenagers	9 2%	6 2%	7 3%		22 2%
Would like more space	7 1%	9 3%	4 2%		20 2%
Would like a better view	13 2%	4 1%	1 0%		18 2%
Dog owners to remove dog mess and control barking	3 1%	8 3%	6 3%		17 2%

5.3.5 Do residents of housing developments in which only shared, private residential outdoor space is provided, use that space in the way that they would like?

Section 5.2.1.2 shows that, in this sample, those with shared residential outdoor space only, are far less active in it than are those with some individual space. One explanation for this could be that the demographic characteristics of respondents who have access to shared space only, are very different from other respondents and that many of these residents do not want to be active outside. The different characteristics of the four sets of respondents and their relationship to variations in usage are explored in the following chapter (Section 6.2.4). Regardless of these demographic differences the evidence given in Sections 5.3.1 to 5.3.5 indicates that residents with shared residential space only, have similar requirements, interests and concerns as those who have individual outdoor space. This suggests that a proportion of those with shared space only, are not able to do all the things that they would like to do in their residential outdoor space. This is supported by only 24% of them agreeing with the statement that they could do everything that they would like to do in their outdoor space. Possible reasons for this are investigated in the next two chapters.

5.4 Summary

In this chapter it has been clearly established that respondents who have access to shared residential outdoor space only are far less active in it than those who have some individual ROS. Only 32% of respondents with access to shared ROS and no individual space *hang washing out* and only 27% *sit and relax* at least once a week in the warmer months. These figures compare to averages for the whole sample of 61% and 60% respectively. 39% of

respondents in the SROS set never *hang washing out* and 30% never *sit and relax*, while these proportions are 10% and 5% in the IROS set. Moreover, 21% of those with shared ROS only, do no activity at least once a week in their space, compared to about 5% of those with some individual space.

As explained in Section 5.2.1.2, an attempt to discover the differences in how respondents with both individual and shared residential outdoor space use the two types of ROS largely failed, though it appears that they use their individual ROS for a greater variety of activities than they do their shared ROS. Twenty respondents in the ISROS set commented on the benefits of having both their own private space and a well-maintained communal space that enables contact with neighbours. Another twenty-seven respondents in the ISROS set commented that the shared space was hardly used by adults because it was too small, poorly maintained or over-run by unruly children.

The information discussed in Section 5.3 suggests that respondents with access to shared space only, have similar aspirations to others when imagining their ideal residential outdoor space. The same proportion of respondents in the SROS set as in the IROS set want an outdoor space where they can *sit and relax*; an attractive environment where they can *entertain visitors* and a secure place to *hang washing out* and for *children to play*. Only 24% of them, however, could agree with the statement 'I am able to do everything I would like to do in this space.' 55% of respondents with individual ROS only, agreed with this statement. Respondents with shared ROS only were also less likely to be satisfied with their outdoor space than those with some individual ROS.

This evidence suggests that as many respondents who only have access to shared ROS are keen to be active outdoors as in the sets with some individual ROS and that part of the reason for lower levels of usage in shared residential outdoor spaces is that these spaces do not provide residents with the affordances that they need. This is corroborated by respondents' answers to the open questions of the questionnaire. Those with shared residential outdoor space only were less likely than those with individual ROS to comment favourably about their ROS. They were also more likely to say that they like 'nothing' about their space, want it to be greener and have better planting and to complain about nuisances.

In the next two chapters the many factors that work together to cause these differences in usage are explored. In Chapter 6, the attributes of the residents, the development, the outdoor space and the local area are compared across the three main sets and those that vary with usage are identified. In Chapter 7 the characteristics of specific developments exhibiting different levels of usage are investigated to discover the features that are most helpful in making shared residential outdoor spaces usable.

6.1 Introduction

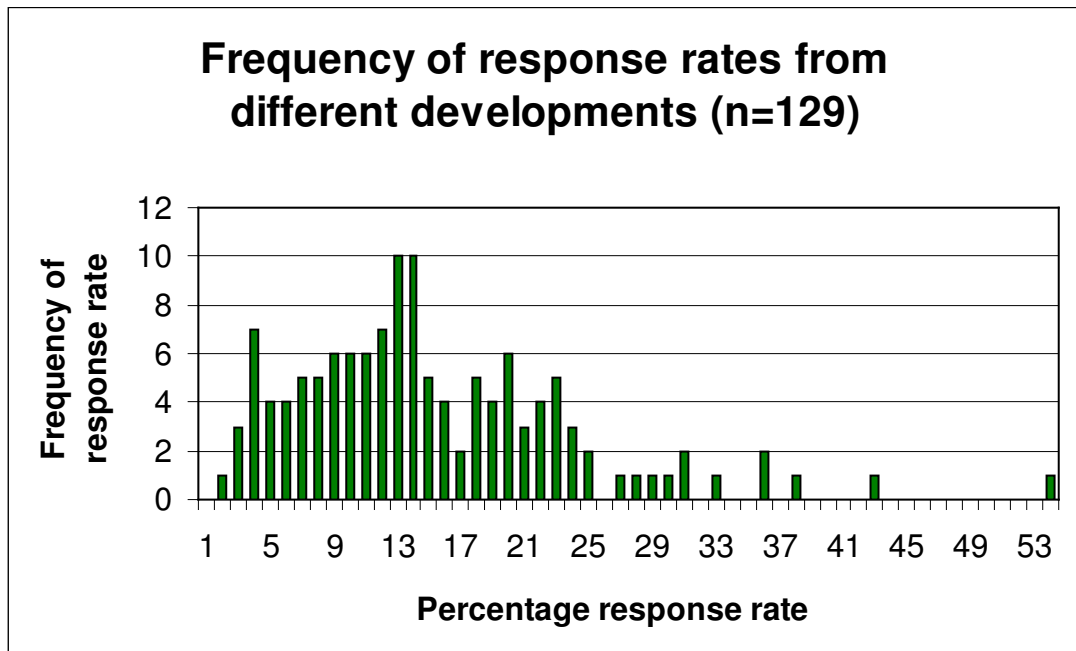
In Chapter 5 it was established that respondents who have access to shared residential outdoor space only (SROS) have similar views to other respondents about the functions of their ideal ROS, but are less active users of their residential outdoor space. Fewer than a quarter of them agree that they are able to do everything that they would like to do in their outdoor space. This chapter reviews the characteristics of the respondents, their dwellings, the development and the surrounding area to establish what factors may influence the amount of residential outdoor activity respondents engage in. The attributes of the three sets of respondents: those with shared outdoor space only (SROS), those with individual outdoor space only (IROS) and those with access to both (ISROS), are compared to establish if any of these variables are linked with differences in usage between them. This provides the foundations for answering the third research question:

- What factors influence the way in which residents use their shared, private residential outdoor space?

6.2 Attributes of the sample**6.2.1 Context**

The sample of dwellings that questionnaires were sent to was selected to give a range of building type, age, layout of residential outdoor space and residential location. As Graph 6.1 shows, however, responses from the 144 different sites were variable, ranging from zero (15 sites not shown as not included in the analysis) to 54%.

Graph 6.1



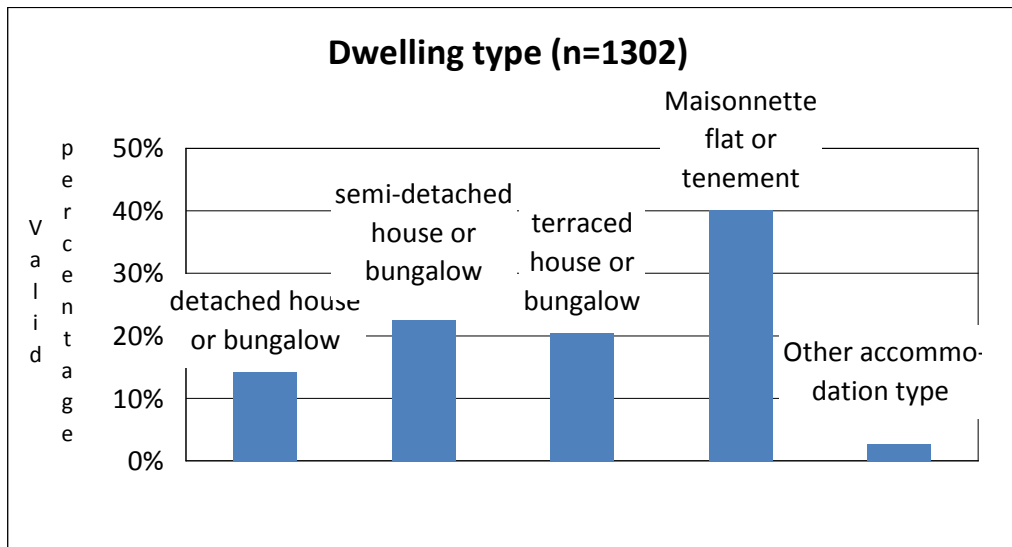
The overall response rate was 15%, and the most frequently occurring response rates from specific developments were between 12.5% and 14.5%. The sample does not, therefore, have exactly the distribution of features that was intended in the initial sampling strategy. In this section, the distributions of the attributes of the received sample are examined to determine which variables have enough coverage to be usefully analysed and any differences in distribution of attributes between the sets.

6.2.2 Attributes of the dwelling

6.2.2.1 Dwelling type

Graph 6.2 shows the distribution of dwelling types surveyed. 40% of respondents live in a flat, maisonette or tenement. 22% live in a semi-detached or end of terrace house or bungalow, 20% in a terrace and 14% in a detached house or bungalow. The remaining 4% are unspecified.

Graph 6.2



The sample was selected primarily to give a wide range of shared spaces. Surrounding housing was then selected to provide a mixture of house types. As shown in Graph 6.3, 92% of the sample that have no residential outdoor space, and 84% of those with only shared space, live in flats, maisonnettes or tenements. About 55% of those with access to both individual and shared space live in flats, while 85% of those with individual residential outdoor space only live in houses.

Graph 6.3

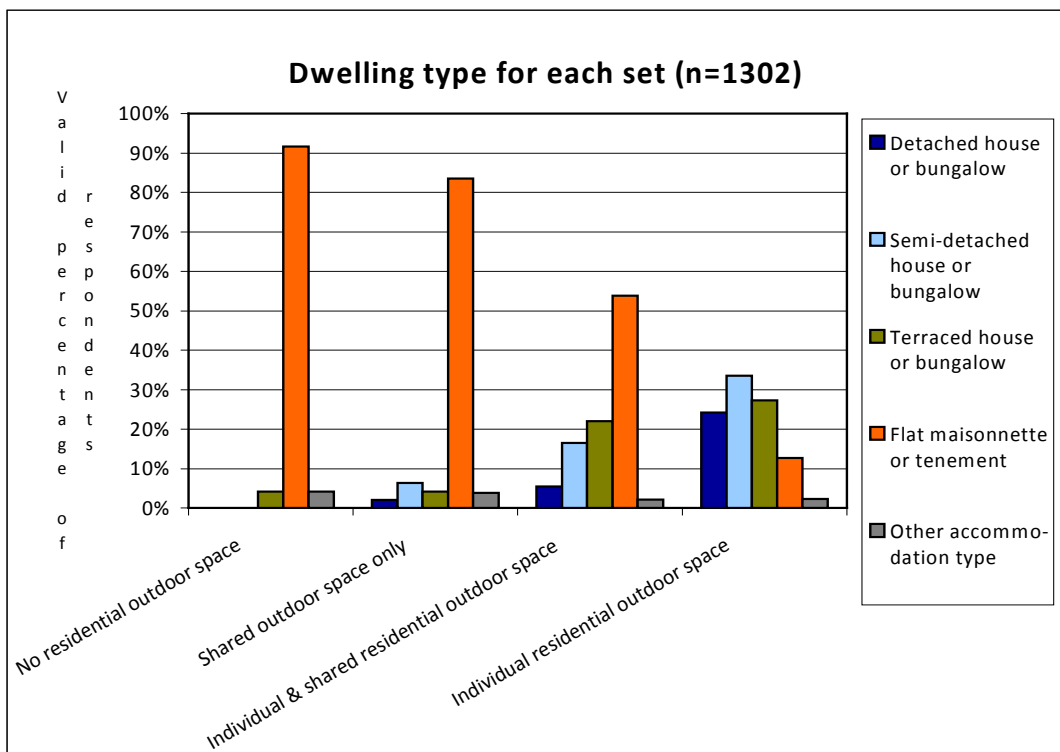


Table 6.1 summarises the cross-tabulations between the percentage of residents doing each activity at least once a week, and dwelling type. In this and following tables of cross-tabulations, where differences are greater than 5%, the highest values are shaded green and the lowest values are shaded yellow.

Table 6.1 Cross-tabulations of dwelling type against proportion of respondents taking part in each activity at least once a week (n=1214)

	Detached house or bungalow	Semi-detached house or bungalow	Terraced house or bungalow	Flat, maisonette or tenement	Other accommodation type
Hanging washing out	79%	78%	73%	28%	52%
Entertaining visitors	25%	28%	26%	15%	17%
Keeping pets	34%	35%	35%	5%	11%
Gardening	76%	58%	57%	13%	32%
Growing food	28%	19%	20%	5%	11%
Eating outside	44%	40%	38%	14%	26%
Enjoying wildlife	59%	41%	38%	13%	23%
Sitting and relaxing	73%	72%	70%	32%	47%
Talking to neighbours	51%	50%	54%	25%	17%
Maintaining car	28%	13%	10%	2%	5%
Exercising	31%	20%	21%	10%	11%
Children's Play	33%	32%	34%	8%	14%
Access	41%	33%	44%	34%	23%
Other	3%	4%	1%	5%	0%
Number of responses	179	286	263	458	28

Substantially fewer respondents who live in flats, engage in all activities (apart from *access* and *other*) compared to those who live in houses. Levels of activity are similar between types of house, though respondents in

detached houses are more likely to be *gardening, growing food, enjoying wildlife, maintaining their car* and *exercising* than those in other types of house. For this analysis dwelling type is reduced to two values: flat or house.

6.2.2.2 Tenure

Table 6.2 shows the distribution of tenure in the sample. Just over half the sample own their homes. Nearly one third rent from a Council or Housing Association, while 8% rent from a private landlord and 4% have a shared equity arrangement.

Table 6.2 Distribution of tenure

		Number	Percent	Valid Percent
Valid	Own outright or with a mortgage or loan	678	50.9	52.9
	Pay part rent / part mortgage	59	4.4	4.6
	Rent from Housing Association or Council	432	32.5	33.7
	Rent from private landlord	112	8.4	8.7
	Total	1281	96.2	100.0
Missing	System	50	3.8	
Total		1331	100.0	

Graph 6.4

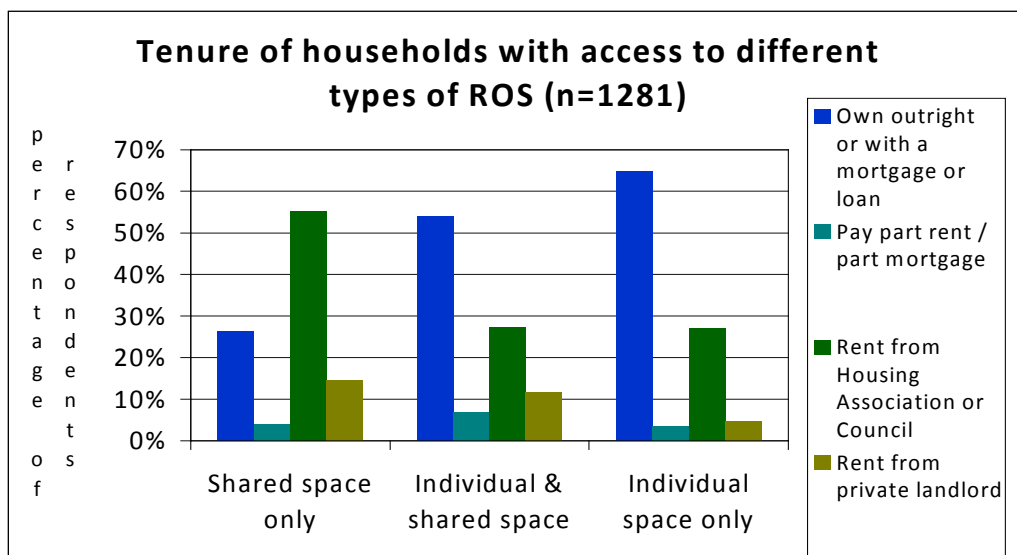


Table 6.3 (Appendix 6.1) and Graph 6.4 show the distribution of tenure in the different sets. The proportion of owner occupiers is higher where households have access to individual outdoor space. Only 26% of those who only have shared space own their dwelling. Renting shows the reverse trend.

Table 6.4 summarises cross-tabulations between the percentage of residents doing each activity at least once a week, against tenure.

Table 6.4 Cross-tabulations of tenure against proportion of respondents taking part in each activity at least once a week (n=1194).

	Own outright or with a mortgage or loan	Pay part rent / part mortgage	Rent from Housing Association or Council	Rent from private landlord
Hanging washing out	61%	47%	36%	53%
Entertaining visitors	22%	13%	25%	17%
Keeping pets	24%	16%	22%	11%
Gardening	54%	32%	29%	22%
Growing food	19%	13%	9%	8%
Eating outside	39%	25%	17%	24%
Enjoying wildlife	41%	16%	22%	17%
Sitting and relaxing	64%	42%	46%	44%
Talking to neighbours	43%	18%	43%	24%
Maintaining car	13%	8%	5%	10%
Exercising	20%	10%	15%	16%
Children's Play	23%	15%	24%	16%
Access	37%	33%	36%	39%
Other	3%		3%	8%
Number of responses	650	53	389	102

Respondents who own their own home are more likely to engage in most activities, particularly *gardening, enjoying wildlife, sitting and relaxing* and *eating outside*. Those who rent from a private landlord are least likely to be *keeping pets, gardening or growing food*. Those who rent their dwelling from the public sector use their residential space regularly for social purposes, such as *entertaining visitors, talking to neighbours* and *children's play*, about as much as homeowners, but are the least likely to *eat outside, hang washing out* and do *car maintenance*. Those who partly own their dwellings show similar or lower levels of most activities as those who rent from private landlords. The exceptions are *keeping pets, gardening* and *growing food* for which levels of usage are higher than tenants of private landlords and lower than full owners. Many of these differences will be due to differences in the type of residential outdoor space available, but some may be due to the increased mobility of those who rent, especially in the private sector, where many leases are short term (Michelson, 1977). The *keeping of pets* is often forbidden in rented properties. Owners are more likely to engage in activities relating to their property and to social life, though this may be related to length of residence as well as to tenure. Length of residence (see Section 6.2.4.2) may also be the more significant factor in the higher level of social activity amongst those who rent from the public rather than the private sector.

6.2.2.3 Lowest storey of dwelling

919 (69%) of dwellings in the sample have their lowest storey on the ground floor and an additional 31 have the lowest level in the basement or semi-basement as shown in Table 6.5 (Appendix 6.1) and Graph 6.5. 26% of the sample have their lowest level above ground level and 34 (2.6%) households did not answer the question.

Graph 6.5

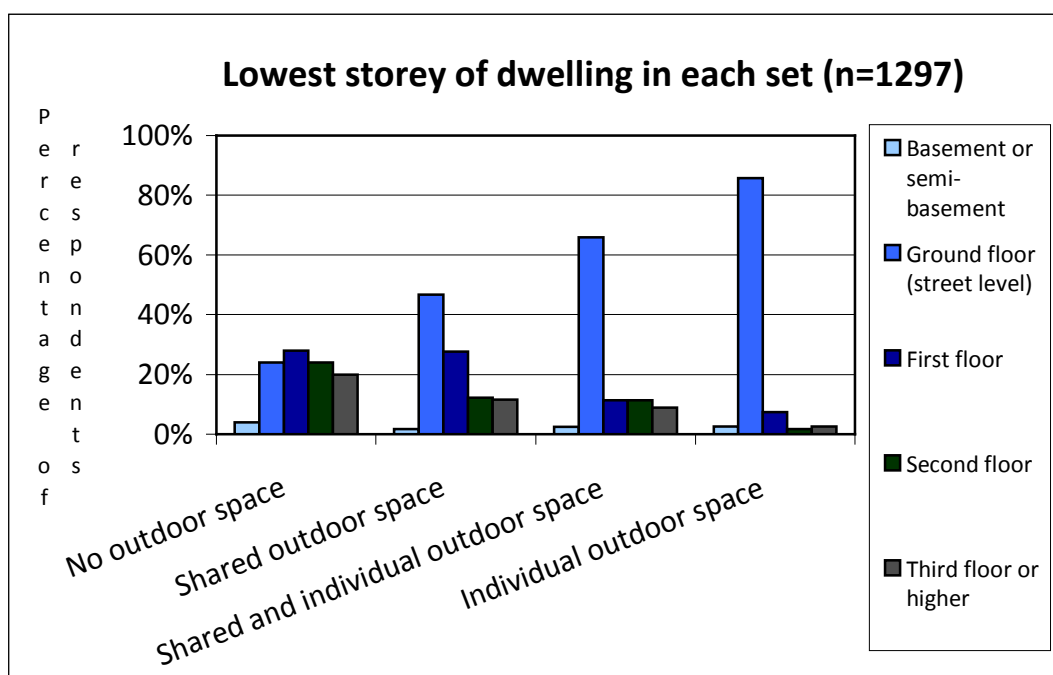


Table 6.6 shows how the distribution of lowest level of living accommodation is split between houses and flats.

Table 6.6 Lowest floor level of living accommodation in flats and houses

	Flats, maisonettes, tenements			Houses, other	
	Frequency	Percentage of flats	Percentage of floor level	Frequency	Percentage of houses
Basement or semi-basement	14	2.7%	45.2%	17	2.2%
Ground floor (street level)	207	39.7%	22.5%	712	91.9%
First floor (floor above street)	132	25.3%	76.3%	41	5.3%
Second floor	87	16.7%	96.7%	3	0.4%
Third floor or higher	82	15.7%	97.6%	2	0.3%
Total	522	100.0%		775	100.0%

Almost all respondents with lowest level of living accommodation above the first floor live in flats rather than houses. As shown in Section 6.2.2.1, 84% of dwellings in developments with shared space only are flats. The initial

sample was constructed to give equal numbers from different floors in each development. The number of responses from flats on floors above ground level was considerably lower than from ground floor flats (Table 6.6). The five interviews with residents living above ground level give some clues as to why this is. All five said that they did not feel that the shared outdoor space was ‘theirs’, although they gave different reasons. This aspect is discussed in detail in Chapter 7.

Table 6.7 Cross-tabulations of lowest floor of living accommodation in flats only against proportion of respondents taking part in each activity at least once a week (n=458).

	Basement or semi-basement	Ground floor (street level)	First floor (floor above street level)	Second floor	Third floor or higher
Hanging washing out	42%	34%	25%	24%	20%
Entertaining visitors	0%	17%	14%	19%	8%
Keeping pets	7%	7%	3%	2%	2%
Gardening	21%	15%	10%	13%	12%
Growing food	14%	6%	4%	3%	4%
Eating outside	14%	12%	12%	20%	13%
Enjoying wildlife	21%	14%	12%	16%	11%
Sitting and relaxing	57%	33%	28%	35%	30%
Talking to neighbours	28%	30%	20%	23%	20%
Maintaining car	0%	3%	1%	2%	1%
Exercising	0%	12%	9%	11%	9%
Children's Play	7%	11%	7%	9%	1%
Access	21%	40%	31%	32%	28%
Other	7%	3%	3%	5%	9%
Number of responses	14	185	116	74	69

To avoid the influence of housing type, cross-tabulations between lowest floor level of accommodation and each activity were done for flats only, as summarised in Table 6.7.

Respondents who live in flats with their lowest level of living accommodation on the ground floor or below are the most likely to use their residential outdoor space for most activities. Those on the second floor show higher rates of *entertaining visitors* and *eating outside* than those on other floors. This may be linked to the provision of individual balconies. 46% of respondents on the third floor and above and 38% of those on the second floor have their own private balconies, but only 20% of those on the first floor do.

This variable was dichotomised as

0	= ground floor and below
1	= first floor and above

6.2.2.4. How the attributes of the dwelling are linked to usage

Case by case analysis of usage against dwelling type, tenure, and lowest storey of the dwelling was done using fsQCA software. This confirmed that the group who use their residential outdoor space the most (for four different activities at least once a week in the warmer months) are owner-occupiers of houses, followed closely by social tenants of houses. Owner-occupiers of flats use their residential outdoor space for a smaller range of activities than house owners do. Two characteristics significantly reduce the probability that flat dwellers in this sample use their residential outdoor space for as many as four activities. These are tenure (private tenants show much lower usage than social tenants and owners, Table 6.4) and

lowest level of the living accommodation above the ground floor (Table 6.7). This indicates the importance of private balconies to flat dwellers.

6.2.3 Attributes of the development

The developments surveyed had a wide range of provision of private residential outdoor space, from none at all to large individual gardens. The range of characteristics is summarised in this section.

6.2.3.1 Age of development

A particular interest of this research is how residential outdoor space is provided in the most recent (post-2000) housing developments. For this reason a high proportion of the developments surveyed were of this era and over half the responses are from people living in post-2000 dwellings. The two main criteria for selection of developments were layout and location, but with the added criterion of sampling a range of building ages pre-2000 for comparison. Approaches to provision of residential outdoor space have changed as cities have expanded and different layouts of shared residential outdoor space are typical of particular eras. During the early part of the 20th Century housing densities in Great Britain decreased (Swenarton, 1981), but since the 1960s they have increased and continue to do so. The majority of the locations selected were town or city centres. The Modern era (1960-1979) is better represented than earlier eras because it was a period when considerable redevelopment of urban centres took place and houses were often replaced with blocks of flats where residential outdoor space is shared.

Table 6.8 gives the distribution of dwelling era in the original sample and in the responses received. The latter is shown in Graph 6.6.

Table 6.8 Era of dwellings as proportion of the sample (n=1328)

Era	sample	returns
2000+	56%	57%
1980-1999 (Post-modern)	5%	4%
1960-1979 (Modern)	16%	15%
1946-1959 (Post-World War 2)	8%	8%
1919-1945 (Inter-war and WW2)	4%	6%
1901-1918 (Edwardian and WW1)	4%	4%
1837-1900 (Victorian)	5%	5%
Pre 1837 (Pre-Victorian)	1%	2%

Graph 6.6

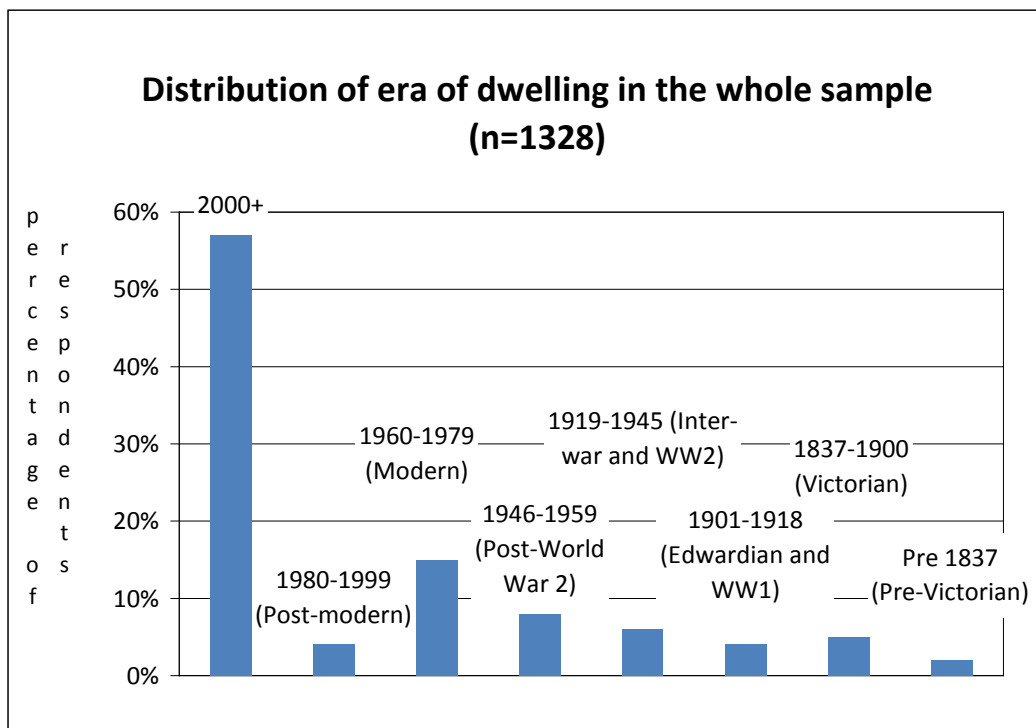


Table 6.9 Distribution of era of development as a proportion of respondents in each set (n=1328)

	No ROS	Shared ROS only	Shared & Individual ROS	Individual ROS only	Whole sample
2000+	72%	52%	78%	48%	57%
1980-1999	0%	4%	1%	5%	4%
1960-1979	0%	18%	10%	17%	15%
1946-1959	0%	6%	5%	11%	8%
1919-1945	0%	3%	2%	9%	6%
1901-1918	8%	8%	1%	3%	4%
1837-1900	8%	8%	2%	5%	5%
Pre-1837	12%	2%	1%	2%	2%

Table 6.9 shows how the different ages of building are distributed across the sets. This suggests that the combination of individual and shared space has become more popular since 2000. It is striking that 72% of the respondents with no shared space live in post- 2000 developments while the rest date back to pre-1918. Sixteen out of the eighteen respondents with no space in a post-2000 dwelling, are in a flat. Seven of these are owner occupiers who have no balcony in a development where some flats have balconies. The rest are tenants who are either in the same situation or have no key to shared ROS and are not sure if they are allowed to use it. This suggests that building dwellings with unfair distribution of balconies is a recent phenomenon, though this sample may be too small and self-selected to be definitive. This is a possible subject for further research.

Table 6.10 (Appendix A6.1) gives this distribution transposed, as percentages of respondents living in different ages of development.

Table 6.11 shows that rates of usage are spread evenly across the era of dwelling for most activities. The periods from 1919 to 1959 show the highest rates of usage, probably because this part of the sample has a higher proportion of houses and few flats. The differences of usage due to era are closely linked to differences in type of dwelling, layout and area per dwelling, which as discussed below, have stronger relationships with usage. The impact of era was analysed in three bands:

Post-1999	57% of whole sample	52% of SROS set
1960-1999	19% of whole sample	22% of SROS set
Pre-1960	25% of whole sample	27% of SROS set

Table 6.11 Cross-tabulations of dwelling age against proportion of respondents taking part in each activity at least once a week (n=1285).

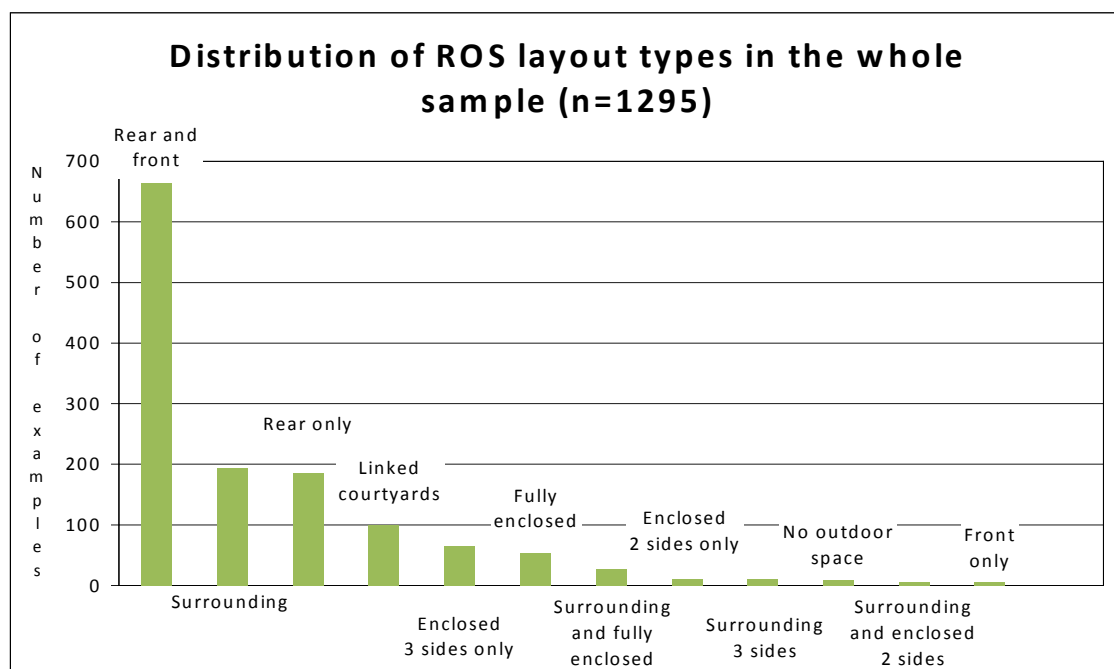
	2000+ Urban renaissance	1980 - 1999 Post- modern	1960 - 1979 Modern	1946 - 1959 Post WW2	1919 - 1945 Inter- war & WW2	1901 - 1918 Edwar- dian, WW1	1837 - 1900 Victo- rian	Pre- 1837 Pre- Victo- rian
Hanging washing out	51%	77%	62%	79%	79%	41%	46%	42%
Entertaining visitors	23%	23%	22%	21%	24%	10%	22%	23%
Keeping pets	20%	21%	28%	34%	32%	16%	6%	23%
Gardening	40%	51%	39%	54%	67%	29%	35%	35%
Growing food	12%	15%	13%	25%	40%	14%	12%	15%
Eating outside	33%	21%	21%	22%	45%	29%	17%	19%
Enjoying wildlife	27%	36%	35%	46%	63%	24%	23%	15%
Sitting and relaxing	54%	57%	57%	61%	77%	45%	45%	35%
Talking to neighbours	35%	49%	50%	55%	55%	43%	43%	12%
Maintaining car	12%	13%	9%	11%	12%	2%	0%	4%
Exercising	18%	17%	22%	20%	25%	6%	5%	12%
Children's Play	23%	19%	20%	26%	32%	29%	18%	12%
Access	37%	32%	38%	41%	37%	47%	17%	15%
Other	4%	2%	4%	4%	5%	4%	3%	4%
Number of responses	755	53	169	104	79	45	59	21

6.2.3.2 Layout of residential outdoor space

The typology of different layouts of residential outdoor space in relation to the dwelling or dwellings is shown in Figure 3.1 and some examples given in Figure 3.2. An attempt was made to find examples of each of these layouts in a range of locations and era of building. In practice some layouts are

much more common than others and particular eras favoured particular layouts. No examples of type no. 10, ROS surrounding three sides of the building plus an inner area enclosed on three sides, were found. Type 12, originally defined as 'other' was redefined as 'linked courtyards', a typology particularly popular post-2000. Graph 6.7 shows the distribution of layout typologies in the whole sample.

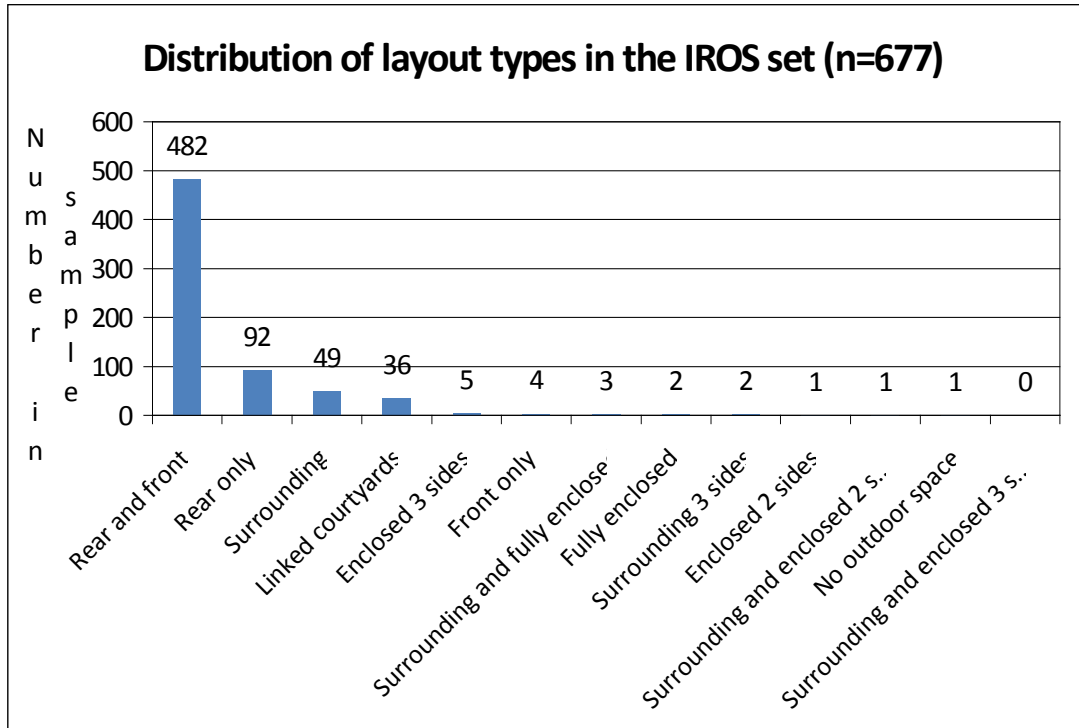
Graph 6.7



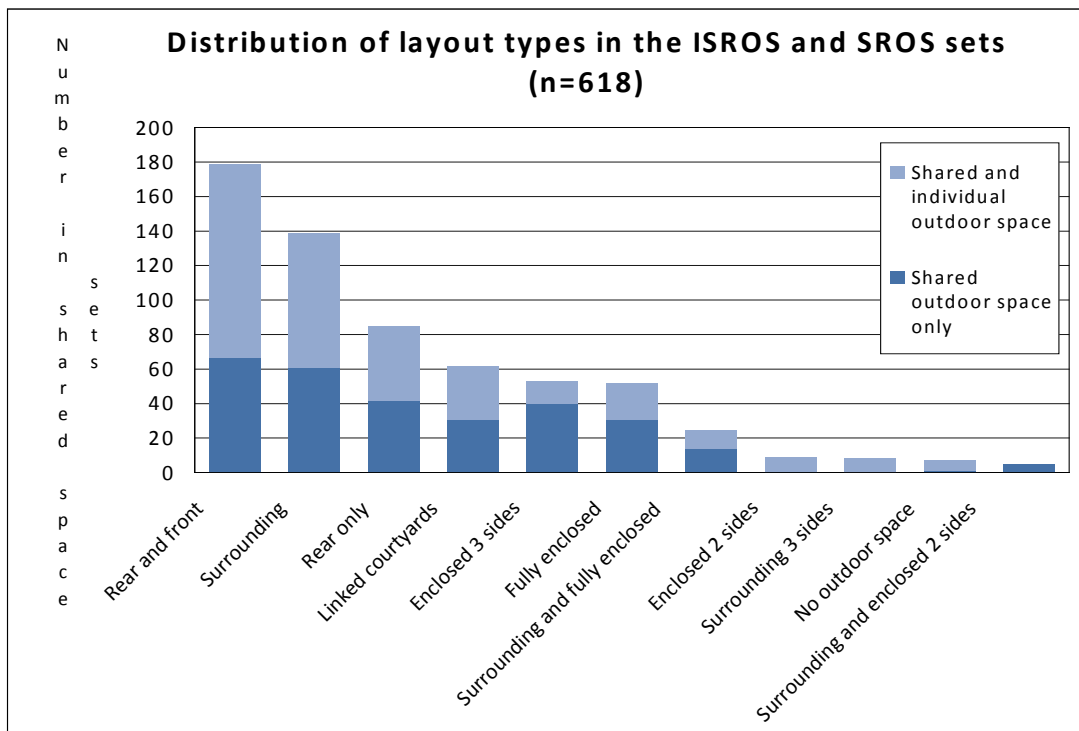
The most frequent typology is No.8, rear and front ROS, because this is the most common layout for individual houses. The initial sample had a similar distribution, but response rates from dwellings with rear and front gardens (No.8) and surrounding outdoor space (No.1) were higher than average, so the preponderance of these typologies was increased. Linked courtyards (No.12) were associated with a lower response rate, so their representation in the final sample was decreased. Graphs 6.8 and 6.9 show the distribution of typologies for dwellings in the IROS set only and for those with some shared ROS, respectively. Over 70% of dwellings with individual outdoor

space only have a rear and a front outdoor space. 14% just have rear space, 7% have outdoor space surrounding the dwelling and 5% are in linked courtyards. No other layout is represented by more than 5 responses.

Graph 6.8



Graph 6.9



The distribution of layout types for developments with some shared space is still skewed, but not so heavily as the whole sample. As the bulk of individual residential outdoor space only is of one layout type it is excluded from further analysis. Table 6.12 shows that activity is greatest in developments with shared residential outdoor space to the front and back. Linked courtyards show fairly strong rates of most activities, especially *entertaining visitors*, but are relatively low in *enjoying wildlife* and *talking to neighbours*. Developments with residential outdoor space enclosed on two or three sides by the buildings show much lower levels of activity compared to other layouts. This may be because people feel that they are under observation in these layouts.

Table 6.12. Cross-tabulations of layout type against proportion of respondents in the SROS and ISROS sets taking part in each activity at least once a week (n=569)

	Surrounding	Surrounding & fully enclosed	Fully enclosed	To the rear only	Enclosed 2 sides or the front	Enclosed 3 sides	To rear and the front	Surrounding & enclosed 2 sides	Surrounding 3 sides	Linked courtyards
Hanging washing out	36%	40%	33%	41%	0%	13%	51%	40%	38%	52%
Entertaining visitors	18%	16%	17%	19%	22%	13%	13%	20%	13%	28%
Keeping pets	9%	12%	13%	7%	0%	4%	23%	0%	0%	17%
Gardening	18%	20%	27%	36%	11%	6%	39%	20%	38%	28%
Growing food	6%	12%	6%	13%	0%	4%	16%	0%	13%	8%
Eating outside	18%	28%	25%	26%	0%	9%	29%	0%	50%	28%
Enjoying wildlife	22%	16%	17%	21%	0%	8%	31%	20%	13%	13%
Sitting and relaxing	40%	44%	48%	45%	50%	23%	51%	0%	63%	46%
Talking to neighbours	40%	24%	40%	32%	11%	26%	40%	40%	25%	26%
Maintaining car	4%	4%	6%	7%	0%	0%	11%	0%	0%	9%
Exercising	13%	4%	21%	16%	0%	9%	21%	0%	13%	14%
Children's Play	16%	20%	15%	8%	0%	13%	18%	0%	25%	19%
Access	44%	48%	37%	31%	11%	43%	42%	20%	50%	41%
Other	5%	8%	6%	5%	22%	2%	3%	0%	0	1
no. of responses	129	24	48	79	10	48	170	3	8	58

Other layouts show reasonable levels of some activities and very low levels of others. These relationships are discussed further in Chapter 7, where specific developments are looked at in more detail. In order to investigate the effect of layout on usage, layout type was dichotomised with the three layouts associated with higher levels of usage amalgamated as one variable and the rest of the layout types as the other:

- 1 = front and rear ROS or linked courtyards or surrounding on 3 sides
- 0 = all other layouts.

6.2.3.3 Number of dwellings sharing outdoor space and area per dwelling

The total area of outdoor space at any site varies with the layout and extent of the development. More relevant measures are the number of dwellings sharing the outdoor space and the area of outdoor space per dwelling.

Table 6.13 summarises the cross-tabulation of usage against the number of dwellings sharing the space, in bands of 10 dwellings, for each activity, for the SROS set. This shows that for all activities apart from access and *entertaining visitors*, usage is highest where fewer than 20 dwellings share the space.

Differences are 25% or more for *hanging washing out* and *talking to neighbours* and about 12% for *entertaining visitors*, *gardening*, *enjoying wildlife* and *sitting and relaxing*. Table 6.14 examines up to thirty dwellings sharing, in bands of five dwellings. The number of respondents in each of these bands is low, particularly in the lowest band of two to five dwellings (two responses). Therefore this lowest band cannot be taken as representative.

Table 6.13 Cross-tabulations of number of dwellings sharing the outdoor space against proportion of respondents in the SROS set taking part in each activity at least once a week
Bands of 10 dwellings (n=259)

	Number of dwellings sharing the outdoor space						
	2-10	11-20	21-30	31-40	41-50	51-60	61+
Hanging washing out	60%	71%	36%	15%	20%	37%	17%
Entertaining visitors	20%	18%	5%	18%	15%	9%	10%
Keeping pets	10%	29%	7%	12%	15%	9%	4%
Gardening	20%	41%	18%	6%	15%	7%	5%
Growing food	20%	12%	9%	0%	5%	0%	1%
Eating outside	20%	18%	7%	6%	10%	9%	6%
Enjoying wildlife	20%	47%	23%	18%	15%	5%	8%
Sitting and relaxing	30%	53%	27%	21%	25%	19%	21%
Talking to neighbours	50%	65%	25%	33%	20%	19%	29%
Maintaining car	20%	12%	7%	6%	0%	7%	2%
Exercising	10%	24%	14%	24%	10%	7%	9%
Children's Play	10%	12%	9%	6%	5%	2%	13%
Access	70%	29%	30%	45%	30%	40%	37%
Other	10%	0%	5%	6%	5%	0%	4%
no. responses	10	16	33	30	16	41	113

These cross-tabulations suggest that, in this sample, activity levels are substantially lower when more than 20 dwellings share the residential outdoor space. Even *talking to neighbours* shows this difference. A possible reason for this was hinted at in a casual conversation with a resident of a tenement block at the pilot site:

‘Some people don’t come out here because they don’t know who might be about.’

As the number of dwellings sharing it increases, the residential outdoor space feels more like a public space than a private one and residents no longer feel

sure that they recognise other users. This makes some people feel more inhibited about using it (Cooper Marcus and Sarkassian, 1986; Newman, 1976).

Table 6.14 Cross-tabulations of number of dwellings sharing the outdoor space against proportion of respondents in the SROS set taking part in each activity at least once a week
Bands of 5 dwellings (n=259)

	Number of dwellings sharing the outdoor space					
	2-5	6-10	11-15	16-20	21-25	26-30
Hanging washing out	0%	75%	78%	63%	38%	36%
Entertaining visitors	0%	25%	33%	0%	6%	4%
Keeping pets	0%	13%	33%	25%	0%	11%
Gardening	0%	25%	33%	50%	19%	18%
Growing food	0%	25%	0%	25%	6%	11%
Eating outside	0%	25%	11%	25%	6%	7%
Enjoying wildlife	0%	25%	44%	50%	25%	18%
Sitting and relaxing	0%	38%	56%	50%	19%	29%
Talking to neighbours	0%	63%	67%	63%	19%	29%
Maintaining car	0%	25%	11%	13%	6%	7%
Exercising	0%	13%	22%	25%	6%	18%
Children's Play	0%	13%	22%	0%	13%	7%
Access	100%	63%	22%	38%	19%	33%
Other	50%	0%	0%	0%	13%	11%
no. of responses	2	8	8	8	10	23

The measured outside area per dwelling was assigned to an area band as follows in square metres: 0-20; 20-40; 40-80; 80-160; 160-320; 320-640; 640-1280; 1280-2560. Table 6.15 gives the cross-tabulations of these bands against activity level for each activity. For most activities the smaller the area the lower the proportion of the residents engaged in them. These relationships are depicted in the set of graphs in Appendix A6.2. These show the mean of the category number against the area bands for each activity in the three main sets.

Table 6.15 Cross-tabulations of outside area per dwelling against proportion of respondents in the SROS and ISROS sets taking part in each activity at least once a week (n=583)

	Outside area per dwelling in square metres					
	0-20	20-40	40-80	80-160	160-320	> 320
Hanging washing out	16%	34%	33%	43%	52%	83%
Entertaining visitors	10%	20%	18%	18%	15%	22%
Keeping pets	4%	4%	9%	12%	29%	44%
Gardening	13%	24%	21%	25%	41%	78%
Growing food	7%	9%	7%	8%	18%	39%
Eating outside	14%	26%	19%	21%	31%	33%
Enjoying wildlife	10%	11%	21%	19%	37%	61%
Sitting and relaxing	39%	44%	34%	39%	57%	67%
Talking to neighbours	22%	23%	28%	37%	53%	56%
Maintaining car	1%	0%	6%	7%	12%	11%
Exercising	4%	10%	20%	14%	27%	28%
Children's Play	9%	10%	8%	19%	19%	28%
Access	38%	23%	33%	46%	49%	28%
Other	8%	1%	3%	4%	3%	0%

Some activity levels vary little as the area per dwelling changes. *Eating outside, entertaining visitors, growing food and sitting and relaxing* do not vary with area, until a sudden increase in the sets with shared space at between 160 and 1280 m² per dwelling. The levels for *entertaining visitors* and *sitting and relaxing* are lower for residents with shared outdoor space only, though the level for the latter rise to the level of the other two sets when the area per dwelling is 160 plus m². Other activities show different behaviour in the different sets. Mean frequency of *hanging washing out* increases steadily with increasing area, but this activity reaches a mean level of at least once a week (4), at a much smaller area per dwelling (40 m²) in the set with individual outdoor space only, than in the other two sets (320 and 1280 m²). The mean frequency of *gardening* and *children's play*

increases steadily with area in the sets with some individual outdoor space, but these activities are engaged in by few residents with shared space only, where the area per dwelling is less than 160 m². *Feeding and enjoying wildlife* shows a similar pattern, but with an unexpectedly high rate for small areas in the SROS and ISROS sets. Area appears to make little difference to this activity for residents with individual outdoor space only, over an area per dwelling of 20 m² per dwelling. Mean rates of *talking to neighbours*, and *exercising* increase slightly as area per dwelling rises.

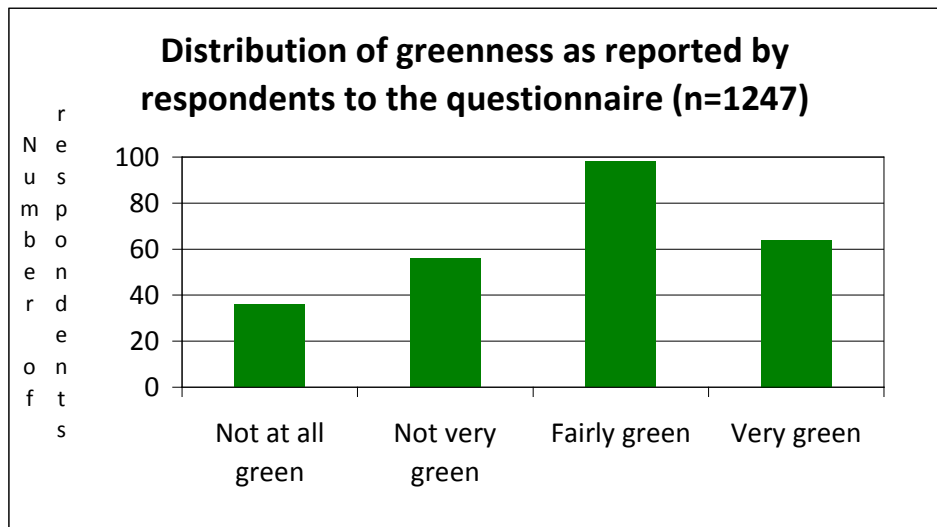
The lower rates of the popular activities *hanging washing out*, *sitting and relaxing*, *gardening*, *entertaining visitors* and *children's play* in shared residential outdoor spaces smaller than 160 m² per dwelling, compared to individual spaces, suggests that where space is limited, small individual outdoor spaces are more likely to be used than if they are amalgamated to form a shared space (note that these spaces include space set aside for off-road parking, where this exists).

Area per dwelling is dichotomised in the analysis as above or below 160 m².

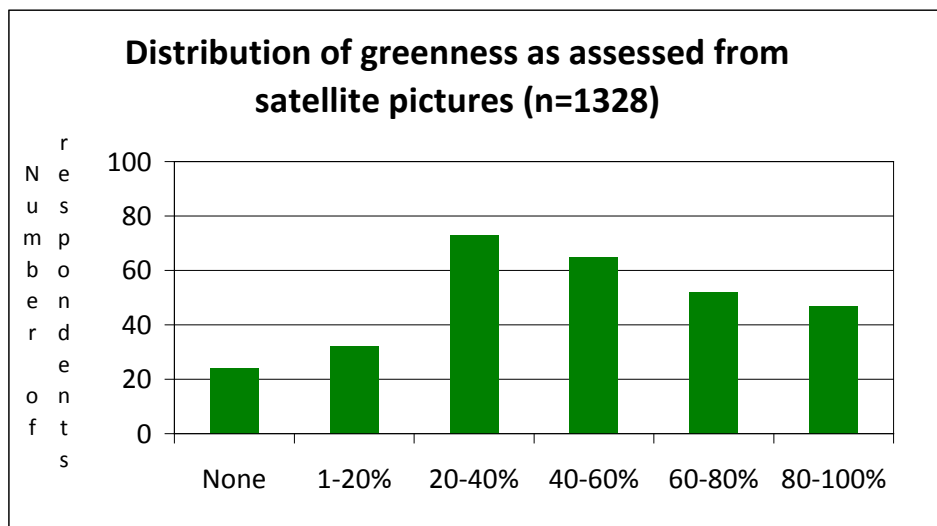
6.2.3.4 Greenness

Greenness was measured in two ways. Respondents were asked how green they would describe their residential outdoor space to be (Q. A2) and the researcher assessed the greenness of each site using satellite photographs from www.bing.com. Graphs 6.10 and 6.11 show the distribution of greenness given by these two measures.

Graph 6.10



Graph 6.11



Comparing these two graphs suggests the following approximate equivalence:

- Not at all green \equiv 0 – 20% green
- Not very green \equiv 20 – 40% green
- Fairly green \equiv 40 – 80% green
- Very green \equiv 60 – 100% green

Examining individual cases shows that respondents from the same development sometimes have different perceptions about the greenness of their environment. It depends on exactly where they are situated and how

large an area they are reporting on. The researcher's perspective is from above and encompasses the whole measured area. Differences between this estimate of greenness and respondents' perceptions at eye level are expected. Tables 6.16 and 6.17 summarise the cross-tabulations made between each of these measures and usage in the SROS set.

Table 6.16 Cross-tabulations of respondents' assessments of greenness against proportion of respondents in the SROS set taking part in each activity at least once a week (n=241)

	Overall, how green would you describe the outdoor space you have access to?			
	Not at all green	Not very green	Fairly green	Very green
Hanging washing out	17%	34%	24%	30%
Entertaining visitors	6%	16%	9%	11%
Keeping pets	11%	5%	8%	8%
Gardening	0%	5%	5%	17%
Growing food	0%	2%	3%	5%
Eating outside	0%	13%	7%	5%
Enjoying wildlife	11%	9%	7%	28%
Sitting and relaxing	6%	21%	19%	36%
Talking to neighbours	36%	25%	21%	42%
Maintaining car	0%	7%	5%	6%
Exercising	0%	13%	11%	19%
Children's Play	19%	11%	6%	9%
Access	50%	46%	43%	31%
Other	6%	2%	6%	3%
No. of responses	34	54	93	60

Table 6.17 Cross-tabulations of researcher’s assessment of greenness against proportion of respondents in the SROS set taking part in each activity at least once a week (n=259)

	Area data: Greenness rating					
	None	1-20%	20-40%	40-60%	60-80%	80-100%
Hanging washing out	0%	22%	30%	20%	37%	43%
Entertaining visitors	0%	13%	12%	6%	10%	21%
Keeping pets	4%	6%	8%	6%	8%	17%
Gardening	0%	13%	3%	6%	13%	30%
Growing food	0%	0%	0%	2%	6%	13%
Eating outside	0%	13%	3%	6%	10%	17%
Enjoying wildlife	8%	0%	8%	6%	25%	34%
Sitting and relaxing	4%	22%	21%	18%	33%	38%
Talking to neighbours	33%	13%	32%	15%	44%	38%
Maintaining car	4%	9%	4%	5%	4%	4%
Exercising	0%	3%	15%	5%	19%	21%
Children's Play	25%	6%	7%	8%	10%	9%
Access	75%	25%	29%	37%	40%	38%
Other	8%	3%	4%	5%	2%	2%
No. of responses	23	27	64	59	46	40

Both tables show that activity is lowest when there is hardly any green and highest in very green outdoor spaces. Two binary variables were used to represent greenness:

- Low greenness
 - 1 = > 20% greenness
 - 0 = < 20% greenness
- High greenness
 - 1 = > 60% greenness
 - 0 = < 60% greenness

6.2.3.5 Tree cover

The density of tree cover was assessed from satellite photographs using www.bing.com. The cross-tabulations of this against activity levels are shown in Table 6.18. Relationships here suggest that some activities have higher levels when a feeling of privacy is enhanced by thick tree cover or trees around the perimeter of the outdoor space. Dichotomising this variable between sparse and moderate and on the boundary or in the ROS were both tried in the case based analysis, but were eliminated during minimisation. 10% of respondents who answered question A4, 'What do you like most about your outdoor space?' named the presence of mature trees. This analysis suggests that trees may influence satisfaction with an outdoor space more than its usage.

Table 6.18 Cross-tabulations of researcher's assessment of tree density against proportion of respondents in the SROS set taking part in each activity at least once a week (n=259)

	Area data: Tree density rating				
	None	Sparse	Moderate	Thick	Mainly on boundary
Hanging washing out	15%	27%	35%	25%	47%
Entertaining visitors	11%	14%	6%	0%	14%
Keeping pets	7%	10%	6%	0%	17%
Gardening	9%	8%	8%	25%	25%
Growing food	0%	2%	4%	0%	14%
Eating outside	7%	4%	7%	25%	19%
Enjoying wildlife	7%	14%	18%	0%	25%
Sitting and relaxing	15%	22%	30%	50%	39%
Talking to neighbours	25%	30%	30%	50%	36%
Maintaining car	4%	3%	3%	0%	14%
Exercising	7%	14%	13%	25%	17%
Children's Play	10%	5%	11%	0%	14%
Access	45%	33%	35%	0%	39%
Other	1%	4%	4%	0%	8%
No. of responses	77	82	64	3	33

6.2.3.6 Boundary

The amount of enclosure around each shared residential outdoor space was assessed visually where possible from satellite photographs using www.bing.com. The cross-correlations of boundary enclosure against usage are given in Table 6.19.

Table 6.19 Cross-tabulations of researcher’s assessment of boundary enclosure against proportion of respondents in the SROS set taking part in each activity at least once a week (n=259)

	Fully enclosed apart from access	1-25% open	25-50% open	Some parts completely enclosed, others completely open	50-75% open	75-100% open
Hanging washing out	29%	38%	16%	9%	40%	17%
Entertaining visitors	6%	14%	14%	32%	20%	8%
Keeping pets	9%	11%	5%	5%	0%	8%
Gardening	8%	24%	5%	9%	0%	0%
Growing food	3%	8%	0%	0%	0%	0%
Eating outside	3%	17%	11%	9%	20%	0%
Enjoying wildlife	10%	22%	14%	23%	0%	8%
Sitting and relaxing	18%	37%	30%	32%	0%	8%
Talking to neighbours	27%	35%	24%	45%	20%	25%
Maintaining car	5%	6%	3%	0%	0%	8%
Exercising	12%	14%	5%	23%	0%	8%
Children's Play	10%	13%	5%	0%	0%	17%
Access	41%	32%	35%	41%	20%	33%
Other	3%	0%	8%	9%	0%	8%
Number of responses	138	56	33	18	4	10

For most activities, usage is higher where 75% of the boundary is enclosed and lower where more than 50% is open. A more open boundary inhibits most activities. The exceptions are *hanging washing out* and the social activities: *entertaining visitors, eating outside* and *talking to neighbours*. This suggests that higher levels of other activities can be encouraged if the residential outdoor space is 75% enclosed or has some areas fully enclosed.

Boundary enclosure was dichotomised as two variables:

1 = \geq 75% enclosed		1 = \geq 50% enclosed
0 = < 75% enclosed	and	0 = < 50% open

6.2.3.7 Inequality of provision of outdoor space

No correlation between either measure of inequality and usage was found as shown in Tables 6.20 and 6.21. (Appendix A6.1)

6.2.3.8 Maximum number of storeys

The number of storeys of the tallest building in the development was recorded using birds-eye view from www.bing.com. Table 6.22 summarises the cross-tabulations against usage. The maximum number of floors in the development is not related to the floor that residents live on, apart from setting the upper limit. The highest levels of usage occur in developments that are limited to single and two storey buildings.

This variable was dichotomised as

1 = maximum number of storeys = 1 or 2
0 = maximum number of storeys > 2

Table 6.22. Cross-tabulations of maximum number of storeys against proportion of respondents in the SROS set taking part in each activity at least once a week (n=259)

Maximum number of floors	1	2	3	4	5	6	7+
Hanging washing out	100%	53%	26%	23%	0%	3%	17%
Entertaining visitors	100%	13%	12%	10%	0%	3%	10%
Keeping pets	100%	14%	8%	6%	14%	6%	0%
Gardening	100%	28%	5%	6%	14%	3%	3%
Growing food	50%	11%	1%	2%	0%	0%	0%
Eating outside	100%	13%	5%	10%	0%	6%	3%
Enjoying wildlife	50%	25%	13%	10%	0%	3%	13%
Sitting and relaxing	100%	38%	19%	21%	14%	9%	30%
Talking to neighbours	50%	48%	29%	19%	14%	21%	20%
Maintaining car	0%	6%	7%	4%	0%	0%	3%
Exercising	50%	23%	12%	4%	0%	3%	10%
Children's Play	50%	13%	5%	12%	14%	18%	0%
Access	100%	41%	34%	25%	43%	64%	27%
Other	0%	0%	5%	4%	0%	3%	7%
Number of cases	2	57	87	48	6	32	27

6.2.3.9 Number of off-road parking spaces and garages

The number of off-road parking spaces and garages available was assessed by inspection of maps and satellite photographs. 89% of respondents with access to shared residential outdoor space only have access to off-road parking. A third of these are provided with at least one parking space per household. Only 5% of the respondents in this set have at least one garage per household. Activity levels are higher where more than one parking space per household is available and where each household has one or more garages. This is demonstrated in Tables 6.23 and 6.24 (Appendix A6.1). The provision of at least one parking space and one or more garage per household were each put into the analysis.

6.2.3.10 How the attributes of the development are linked to overall usage

Case-wise analysis of the attributes identified in this section, in the SROS set only, produces some interesting relationships between attributes of the development and usage (measured as four activities engaged in at least once a week, in the warmer months). Two sets had 100% usage at this level, but only form 8% of the sample. These all have at least one parking place per dwelling and are on developments with buildings no taller than two storeys. 96% of them are 75% or more enclosed. Of these two sets, one has fewer than 20 dwellings sharing the ROS, and at least 60% greenness. The other has area per dwelling greater than 160 square metres. The 86% of cases that share these attributes, but have low levels of usage (below 12%), are in developments where the maximum floor level is higher than two storeys.

83% of the SROS set have less than 10% usage at this level (four activities done at least once a week in the warmer months). These all have more than 20 dwellings sharing the residential outdoor space. Other variables do not vary significantly with this outcome, although lack of greenness is linked with small reductions in activity. The key attributes that vary with overall usage, in this sample, are area of residential outdoor space per dwelling and number of dwellings sharing the space. Maximum floor level, probably as a proxy for lowest level of living space and greenness are also linked with general level of usage. Other attributes, such as tree cover and layout, vary with the level of individual activities, but not with the overall level of usage. For example, lack of enclosure is associated with lower levels of *gardening* and *sitting and relaxing*.

6.2.4 Attributes of the respondents

The ranges of the attributes of the respondents are described in this section. The results of cross-tabulations of each attribute against usage (engaging in at least four activities at least once a week in the warmer months) are discussed. Attributes that are significantly different in the three sets and vary with usage are identified. Case-based analysis is used to establish which of these attributes are most closely linked to changes in usage. Associated graphs and tables not given here are in Appendix A6.3.

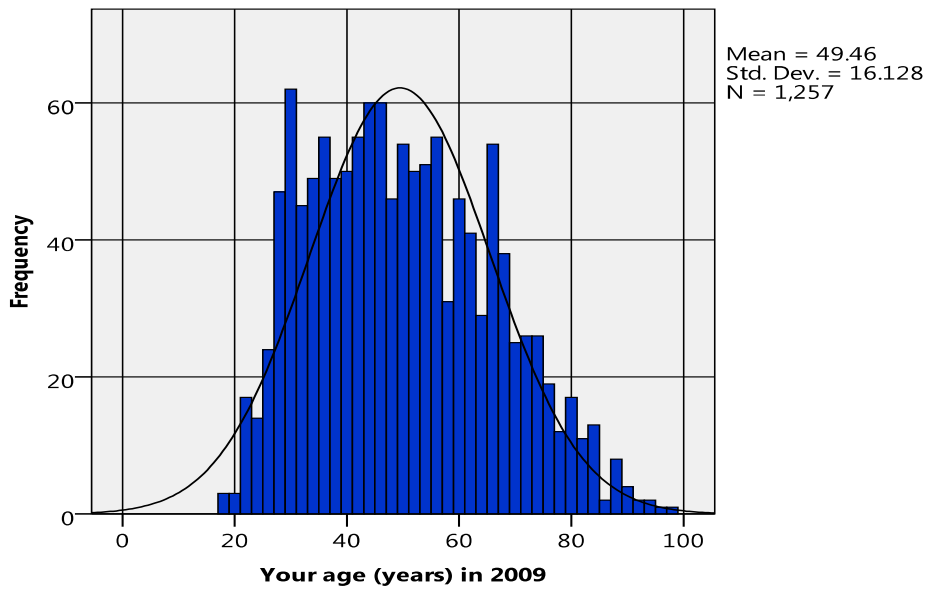
6.2.4.1 Age

The ages of the respondents in the whole sample range from 18 to 97 years. Graph 6.12 shows the spread of ages of 1257 of the respondents, 74 (5.6%) did not answer this question. The distribution of ages plateaus between the ages of 27 and 67 while those under 27 and over 67 years old are less well represented. It is not known if the under-representation of younger and older people is because the actual age distribution in the sample developments has this form or because younger and older people are less likely to reply.

Studies show that older people are more likely than younger people to complete such surveys (Eaker *et al.*, 1998), so it could be that fewer people over 67 live in the developments sampled, compared to younger age groups.

A few of the blank forms that were returned, however, had notes on saying that the householder was elderly and too infirm to fill in the form. This small sample may represent a larger number of older people who were interested in completing the form, but felt unable to do so.

Graph 6.12 Distribution of ages in the sample

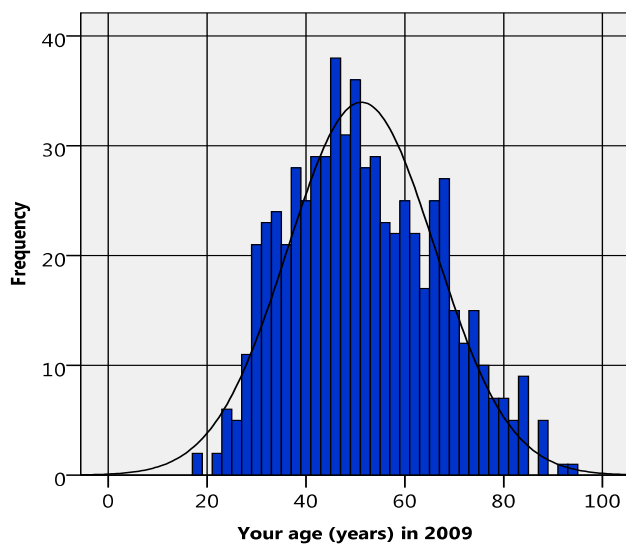


Graph 6.13

Age distribution of respondents with individual residential outdoor space only

N = 636

Mean age = 51.2 years

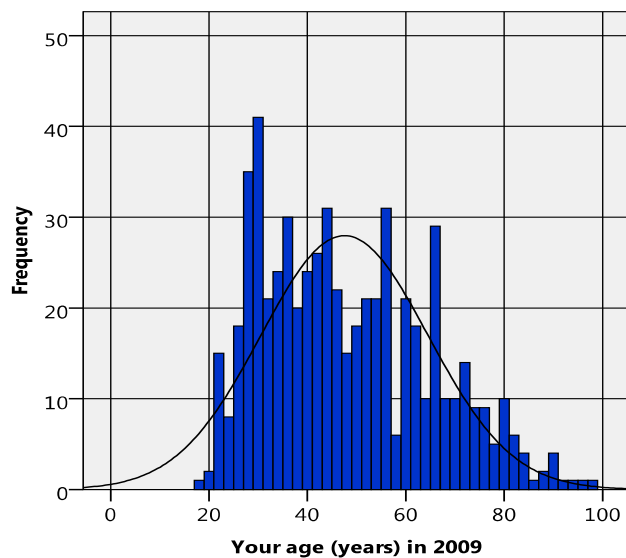


Graph 6.14

Age distribution of respondents with some shared residential outdoor space

N = 596

Mean age = 47.5 years



People younger than 27 are more likely than those older to be living in a shared house or with a parent and are therefore less likely to be the householder and to have completed the questionnaire. There is not enough information to determine if the age distribution of the respondents is representative of the residents of the developments surveyed, but all age groups are well represented in the sample.

The distribution of ages of respondents who share residential outdoor space (Graph 6.14) is flatter than for those with individual ROS but no shared ROS (Graph 6.13), and the mean age is nearly four years younger. The distribution is also more skewed towards the younger age groups.

The mean ages for the sub-samples in order of increasing age are:

Individual and shared residential outdoor space	- mean age is 45.6 years
No residential outdoor space	- mean age is 49.4 years
Shared residential outdoor space only	- mean age is 49.7 years
Individual residential outdoor space only	- mean age is 51.2 years

The age of the sample was divided into six age bands and cross-tabulated with the frequency of each use. Table 6.25 gives the percentage of each group that do each activity at least once a week. Access is largely governed by the layout of the outdoor space in relation to the dwelling, so is not expected to vary significantly with age. Taking this use as the benchmark, the range across age bands is 5%. Variations larger than this may be significant. Ignoring *car maintenance* which is fairly constant with age, this table shows clearly that, in this sample, younger adults are less likely than

other age groups to engage in most activities in their outdoor space. The exception is *entertaining visitors*.

Table 6.25 Cross-tabulations of usage against age band (n=1257)

Activity	Young adult 18-29 yrs	Established adult 30-41 yrs	Middle aged adult 42-53 yrs	Mature adult 54-65	Older Adult 66-77 yrs	Elderly adult 78 plus
Hanging washing out	53%	60%	73%	73%	74%	66%
Sitting and relaxing	49%	56%	67%	69%	68%	71%
Gardening	30%	44%	55%	57%	70%	67%
Talking to neighbours	25%	43%	55%	52%	58%	60%
Access	56%	60%	60%	59%	57%	61%
Enjoying wildlife	15%	28%	43%	51%	56%	72%
Eating outside	32%	35%	40%	46%	42%	41%
Children's Play	33%	51%	51%	26%	30%	22%
Keeping pets	26%	35%	54%	38%	44%	18%
Entertaining visitors	29%	22%	27%	28%	26%	38%
Exercising	16%	21%	25%	25%	31%	47%
Growing food	16%	21%	21%	25%	32%	20%
Maintaining your car	15%	15%	17%	15%	12%	23%
Other	58%	48%	67%	43%	36%	60%
Number of responses	136	313	317	253	172	66

This lower activity may be because younger people are more likely to be active away from the home, or because they move more often (as discussed in Section 4.2.2.2.1) or because they are more likely to live in dwellings with no individual space. Age is therefore a background variable that is included in the analysis.

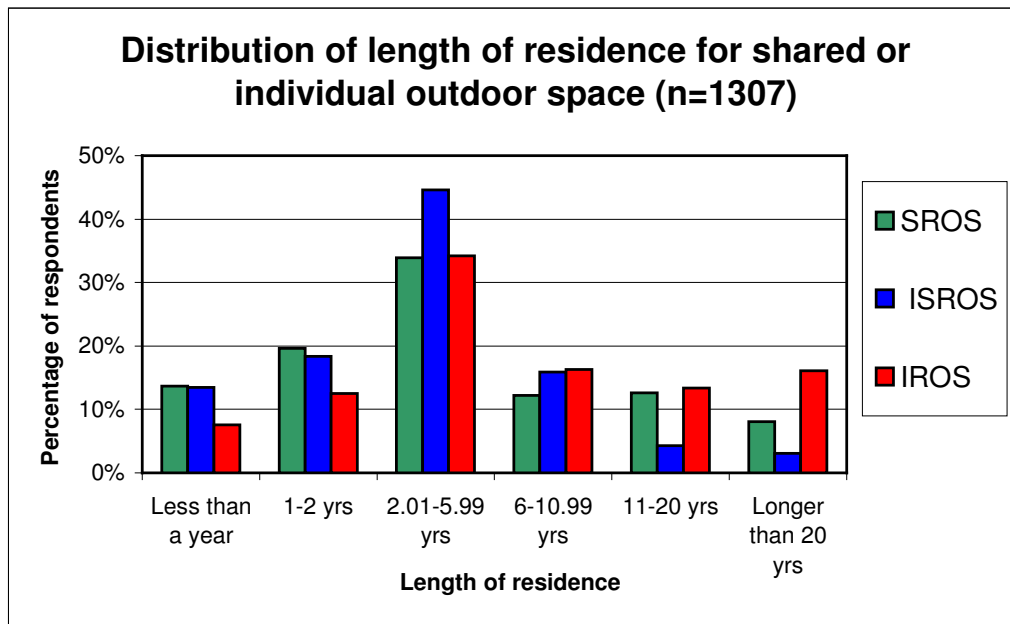
6.2.4.2 Length of residence

The distribution of length of residence for each set is shown in Graph 6.15.

Almost two thirds of the respondents have lived in their present dwelling for less than 6 years, 67% of those in the SROS set, 76% of those in the ISROS set and 54% of those in the IROS set. Average lengths of residence are:

ISROS	4 years 8 months
SROS	7 years 2 months
IROS	9 years 8 months

Graph 6.15



The possible range of this variable depends on the age of the development.

Post-2000 developments, for example, cannot have a length of residence greater than 9 years, as the questionnaire was answered in 2009. 76% of the developments in the ISROS set are post-2000, compared to about 52% of the IROS set and 48% of the SROS set. This accounts for the low average length of residence in the ISROS set. There is still a lower average length of residence in the SROS set than in the IROS set, which cannot be accounted for by the age of developments. Length of residence is also related to the age of the resident, but

not in a simple way, as older people may move house on retirement and younger people may be living in the house that they were brought up in. Table 6.26 gives the cross-tabulations of activity against length of residence.

Table 6.26 Cross-tabulations of frequency of each activity against length of residence (n=1243)

	Less than one year	1-2 yrs	2.01-5.99 yrs	6-10.99 yrs	11-20 yrs	Longer than 20 yrs
Hanging washing out	52%	50%	52%	59%	67%	74%
Entertaining visitors	29%	21%	23%	21%	24%	16%
Keeping pets	19%	21%	19%	27%	32%	24%
Gardening	30%	35%	40%	48%	46%	61%
Growing food	11%	12%	13%	21%	18%	19%
Eating outside	29%	26%	34%	32%	25%	24%
Feeding and enjoying wildlife	29%	23%	28%	36%	37%	51%
Sitting and relaxing	55%	49%	54%	57%	59%	65%
Talking to neighbours	34%	29%	41%	44%	48%	51%
Maintaining your car	7%	12%	11%	12%	6%	10%
Exercising	18%	13%	20%	13%	17%	23%
Children's play space	23%	22%	26%	21%	25%	16%
As an access route	52%	38%	37%	34%	35%	29%
Other	6%	6%	3%	3%	3%	6%
Number of responses	140	205	453	183	121	117

For most activities there is a gradual increase in the proportion of respondents using their residential outdoor space as length of residence increases. The chief exception is *entertaining visitors*, which is highest during the first year. Length of residence was dichotomised as greater or less than six years for the case-based analysis. The trends seen here may be related to age differences.

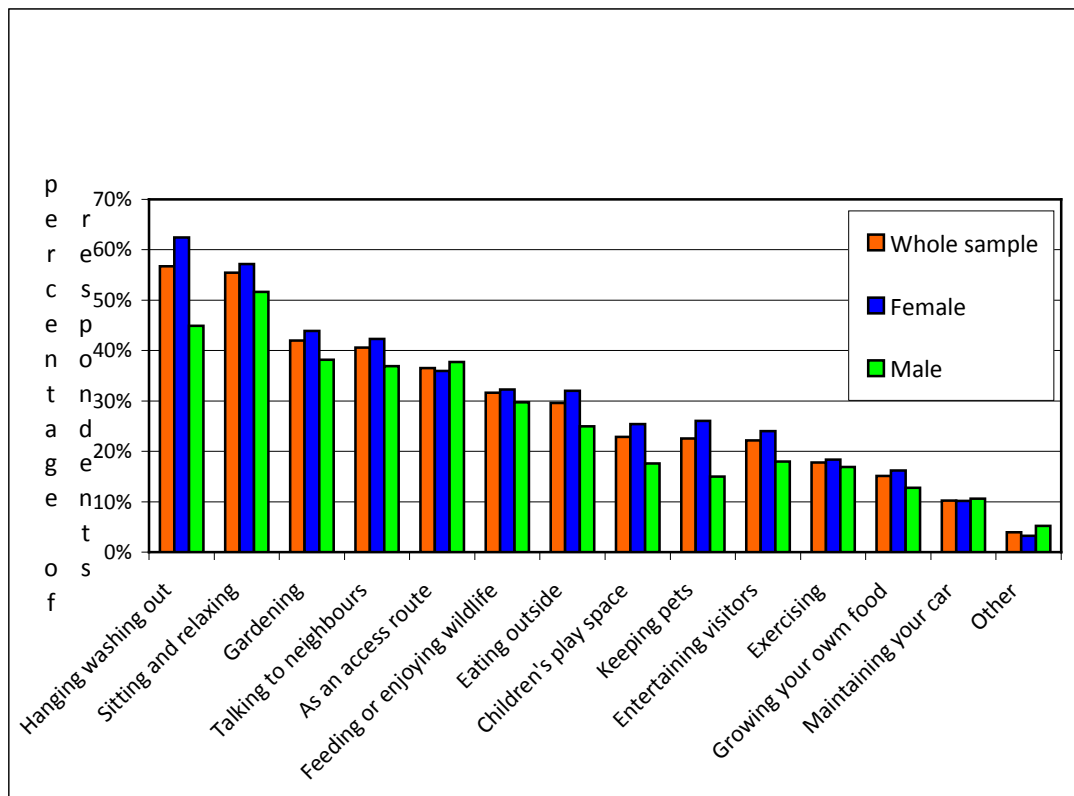
6.2.4.3 Gender

827 respondents (64% of those who answered this question) are female and 461 are male (36%); 43 did not answer. The ratio is approximately 2:1, female:male. This is a typical gender distribution of response for this type of questionnaire (Macara, 1990; Tolonen, 2006). Table 6.27 shows that the proportion of male respondents from dwellings with shared residential outdoor space is slightly larger than from those with individual space only.

Table 6.27 Gender of respondents

	Number of respondents				Valid percentage of sample			
	Individual space only	Some shared space	No outdoor space	Whole sample	Individual space only	Some shared space	No outdoor space	Whole sample
Female	432	377	15	824	66%	62%	63%	64%
Male	221	231	9	461	34%	38%	37%	36%
					100%	100%	100%	100%
Missing	25	17	1	43				
Total	678	625	25	1328				

Graph 6.16



Graph 6.16 shows that for most activities, females are about 5% more likely to engage in activities in their outdoor space than males are. The only activities with a significantly greater difference between genders are *hanging washing out* (18%) and *keeping pets* (11%). Gender is excluded from further analysis due to the small difference between male and female behaviour and the lack of variation of the distribution of males and females between the sets.

6.2.4.4 Ethnic group

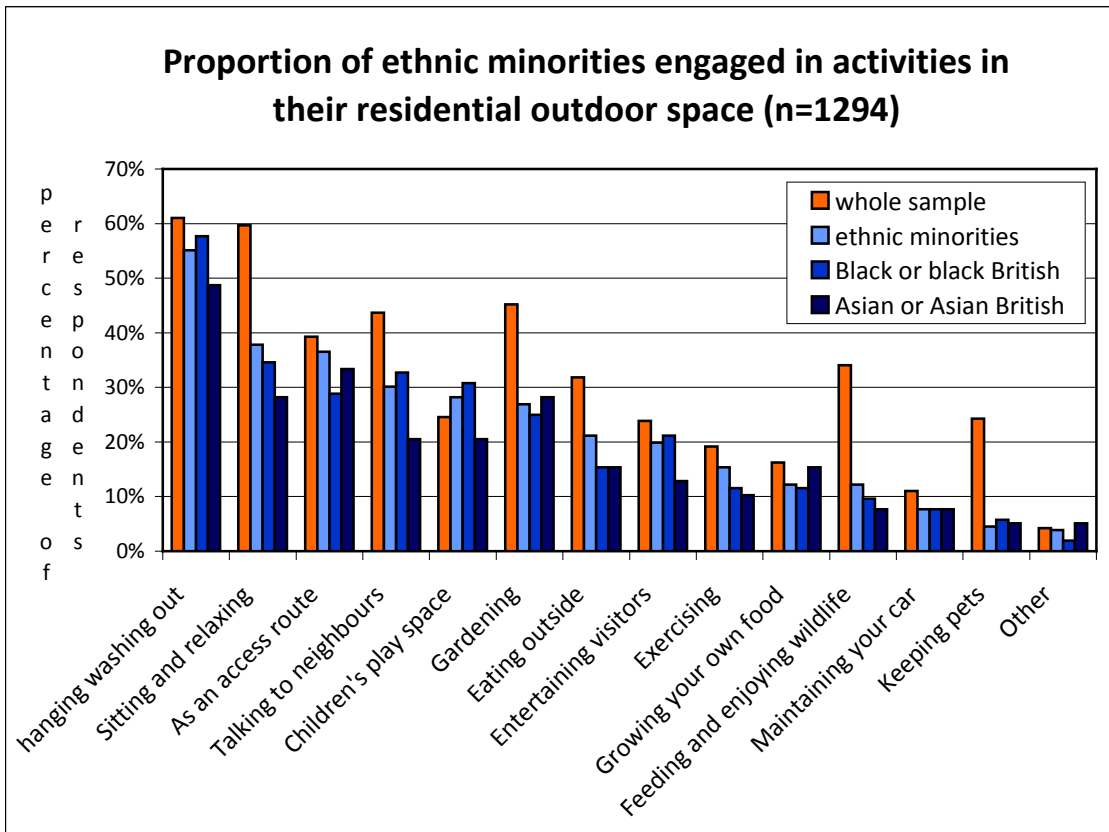
1138 (85.5% of the whole sample and 90% of those who answered this question) describe themselves as white and 74 (5.6%) did not answer this question. Table 6.28 summarises the distribution of ethnic groups represented. Just over 4% and 3% of respondents describe themselves as 'black or black British' and 'Asian or Asian British' respectively. These are small proportions of the whole sample, but are big enough samples to be analysed separately to explore the possibility of cultural effects.

Table 6.28 Distribution of ethnic groups in the whole sample

		Frequency	Percent	Valid percent
Valid	White	1138	85.5	90.5
	Black or black British	52	3.9	4.1
	Asian or Asian British	39	2.9	3.1
	Mixed race	20	1.5	1.6
	Chinese	8	.6	0.6
Sub-total		1257	94.4	100.0
Missing	Other	37	2.8	
	System	34	2.8	
Sub-total		71	5.6	
Total		1328	100.0	

52 (44%) of the 119 respondents from non-white ethnic groups have individual residential outdoor space only, and 66 (56%) have access to some shared space: 1 of them has no residential outdoor space.

Graph 6.17



Graph 6.17 shows the percentage of respondents of non-white ethnicity who engage in the different activities in their outdoor space. This shows that the frequency of almost all activities is lower in the ethnic minority group and particularly so for *sitting and relaxing*, *feeding and enjoying wildlife*, *keeping pets* and *gardening*. 22% fewer respondents from the ethnic minorities engage in the first two activities, 20% fewer *keep pets* and 18% fewer *garden*, compared to the whole sample. This does suggest the possibility of some cultural differences. The smallness of the numbers in each set and lack of variation of distribution across the sets means that the effect of ethnicity on usage is obscured by other factors. The differences between

different ethnic groups are a subject for further research using this data and not part of this thesis.

6.2.4.5 Socio-economic group

Respondents were asked about their employment status and that of their partner and what work they do or have done. The answers to these questions were used to identify the principal breadwinner in each household. The socio-economic group of the principal breadwinner was identified as one of three classes or no occupation listed:

1. Higher managerial, administrative and professional occupations
2. Intermediate occupations
3. Routine and manual occupations
4. No occupation listed.

This was done by Dr L. Mitchell (as part of the I'DGO TOO Project) using the ONS Standard Occupational Classification 2010 (Volume 3: The National Statistics Socio-economic Classification (Rebased on the SOC2010) User Manual).

623 (47%) of the principal breadwinners were identified as in the higher managerial, administrative and professional occupations; 318 (24%) were in routine and manual occupations and 238 (18%) were in intermediate occupations. 152 (11%) respondents did not answer this question. This means that the sample is skewed towards the professional occupations. This was anticipated, as this group are the most likely to respond to questionnaires ((Macera, *et al.*, 1990; Tolonen, *et al.*, 2006). In an attempt to balance this effect, questionnaires were sent to all the dwellings in some of the bigger social

housing developments, for example, Peabody Housing's Old Pye Street estate, while larger private estates were sampled. Table 6.29 summarises the differences in the distribution of socio-economic group across the sets.

Table 6.29 Socio-economic group across the different sets

Occupation classification	Number of respondents				Valid percentage of sample			
	Individual space only	Some shared space	No outdoor space	Whole sample	Individual space only	Some shared space	No outdoor space	Whole sample
Higher managerial, administrative professional	313	300	10	623	51%	55%	45%	53%
Intermediate	128	105	4	237	21%	19%	18%	20%
Routine and manual	170	139	8	317	28%	26%	36%	27%
Missing	67	81	3	151				
Total	678	625	25	1328				

The distribution of socio-economic status is fairly consistent across the two main sets, but those who have no outdoor space are more likely to have a manual or routine occupation than those with access to residential outdoor space and less likely to be in the higher managerial, administrative and professional group.

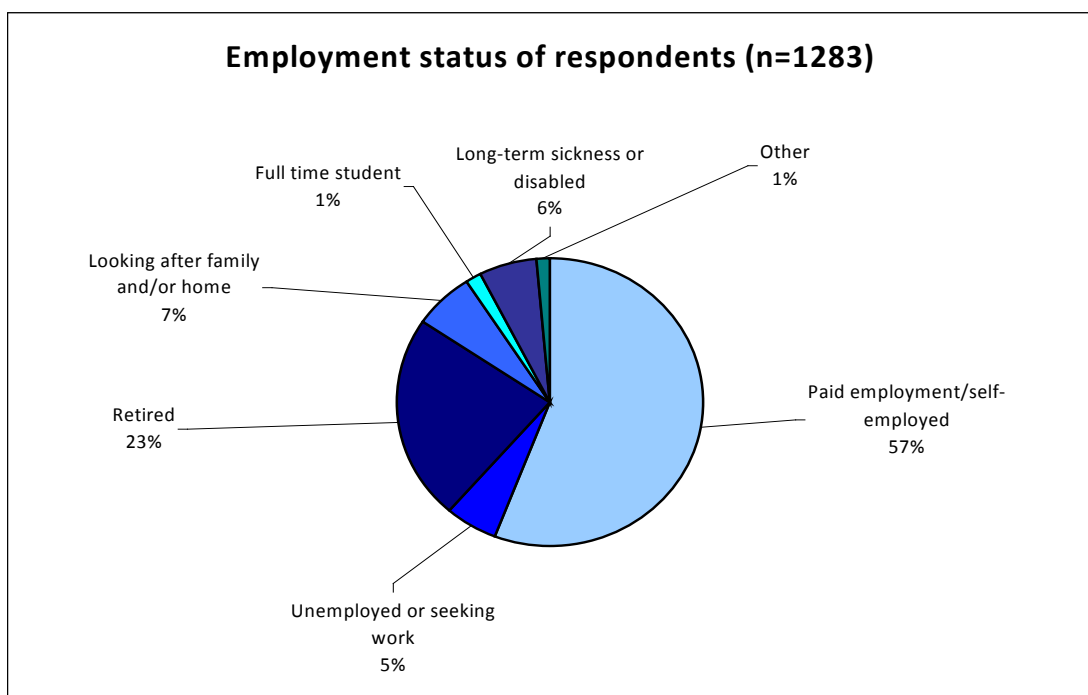
Table 6.30 shows the distribution of socio-economic group for the two shared space sets. This shows that nearly two-thirds of those who have both individual and shared space are in the higher socio-economic group whilst only 44% of those with only shared space are in this group. A higher proportion (more than a third) of those with only shared space are in the routine and manual occupations group. In view of these differences socio-economic status is included in the analysis.

Table 6.30 Socio-economic group of respondents with access to shared, residential outdoor space

Occupation classification	Number of respondents			Valid percentage of sample		
	Shared space only	Individual & shared space	No outdoor space	Shared space only	Individual & shared space	No outdoor space
Higher managerial, administrative & professional	112	188	10	44%	65%	45%
Intermediate	51	54	4	20%	19%	18%
Routine and manual	90	49	8	36%	17%	36%
				100%	101%	99%
Missing	40	41	3			
Total	293	332	25			

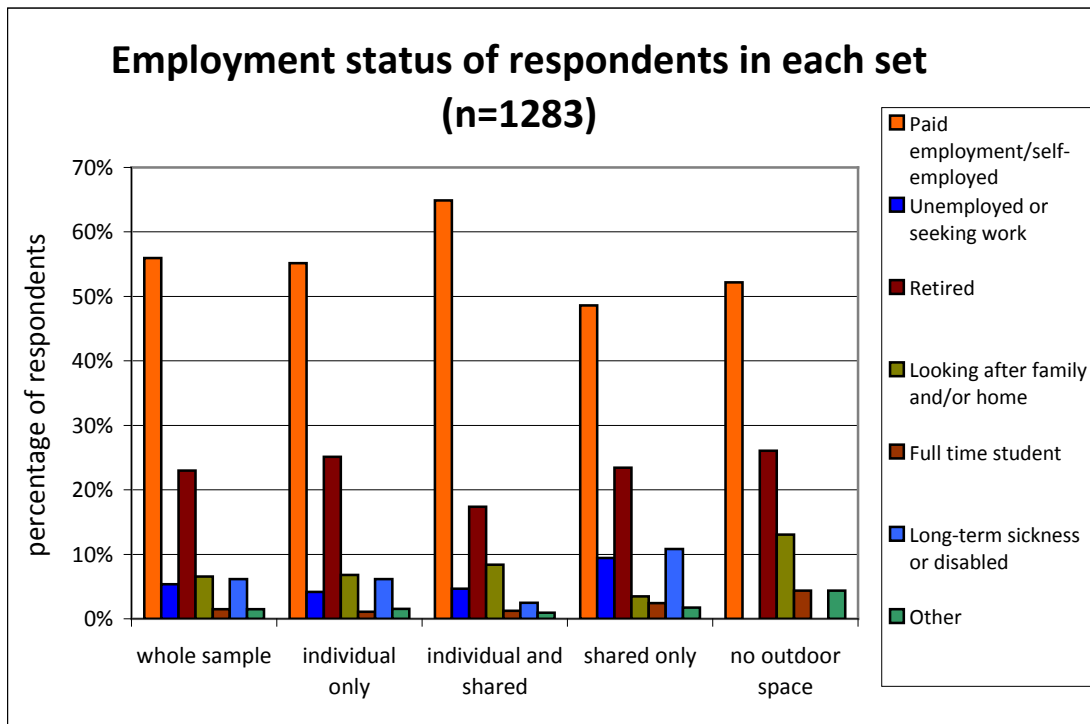
The distribution of employment status of the respondents and their partners is shown in Graph 6.18 and detailed in Table 6.31 (Appendix A6.3). 718 (54%) of respondents were in paid employment or self-employed. The next biggest group of 295 (22%) were retired. 48 did not answer this question. 725 (54%) respondents reported on the economic status of their partners. 620 (47%) did not complete this section mainly because it was not applicable to them. 67% of partners were in employment or self-employed.

Graph 6.18



Graph 6.19. shows this distribution in each set.

Graph 6.19



Nearly two thirds of those with both individual and shared residential outdoor space are in employment, and this set contains fewer respondents who are retired or long term sick or disabled. In the shared space set, compared to the whole sample, there are 15% fewer respondents in employment, 80% more unemployed, half as many looking after the home and about 60% more who are sick or disabled.

Cross-tabulations of activity at least once a week against employment status (Table 6.32) show that, compared to those in paid employment, those who are looking after family and/or home and the retired are more likely to engage this often in activities in their residential outdoor space, whereas students, the unemployed and the long term sick and disabled are less likely.

Exceptions to this can be seen in Table 6.32.

Table 6.32 Cross-tabulations of employment status against proportion of respondents doing each activity at least once a week in the warmer months (n=1180)

Activity	Paid employment/self-employed	Unemployed or seeking work	Retired	Looking after family and/or home	Full time student	Long-term sickness/disabled
Hanging washing out	63%	68%	76%	85%	38%	67%
Entertaining visitors	23%	24%	29%	36%	37%	33%
Keeping pets	39%	32%	40%	54%	30%	39%
Gardening	50%	32%	72%	59%	23%	38%
Growing food	22%	8%	30%	22%	14%	19%
Eating outside	36%	14%	38%	46%	25%	29%
Feeding and enjoying wildlife	34%	29%	63%	47%	14%	36%
Sitting and relaxing	60%	49%	75%	69%	60%	58%
Talking to neighbours	42%	41%	60%	69%	33%	46%
Maintaining your car	14%	12%	16%	26%	11%	21%
Exercising	20%	27%	35%	33%	25%	20%
Children's play space	40%	42%	30%	76%	36%	34%
As an access route	58%	64%	62%	62%	58%	55%
Other	48%	86%	52%	100%	0%	40%
Number of responses	680	66	262	79	18	75

Over 85% of those who look after family and/or home use their ROS at least weekly to *hang washing out* and over three-quarters use the space this often for *children's play*. *Sitting and relaxing* and *talking to neighbours* are also frequent activities. The retired are more likely than any other group to be *sitting and relaxing*, *gardening*, *feeding and enjoying wildlife*, *exercising* and *growing food* and also have a high rate of *hanging washing out*, and *talking to neighbours*.

The reductions in usage in the ISROS group may be partly explained by the smaller proportion of retired respondents in this group. The reductions in usage in the SROS group may be partly associated with the increased proportion of respondents who are sick, disabled or unemployed. This relationship is examined in Tables 6.33 and 6.34, which show the cross-tabulations above done for respondents with access to individual residential outdoor space only, and shared residential outdoor space only, respectively.

Table 6.33 Cross-tabulations of employment status against proportion of respondents in the IROS set doing each activity at least once a week in the warmer months (n=622)

Activity	Paid employment / self-employed	Unemployed or seeking work	Retired	Looking after family and/or home	Full time student	Long term sickness or disabled
Hanging washing out	74%	67%	76%	86%	57%	80%
Entertaining visitors	26%	33%	25%	43%	57%	35%
Keeping pets	34%	30%	23%	36%	29%	43%
Gardening	58%	41%	70%	55%	29%	45%
Growing food	22%	0%	23%	18%	29%	18%
Eating outside	41%	15%	34%	34%	57%	35%
Feeding & enjoying wildlife	38%	26%	58%	43%	29%	43%
Sitting and relaxing	69%	48%	74%	73%	86%	73%
Talking to neighbours	47%	30%	50%	61%	86%	55%
Maintaining your car	16%	15%	10%	23%	0%	18%
Exercising	19%	15%	23%	27%	29%	15%
Children's play space	33%	26%	14%	80%	43%	28%
Access route	39%	30%	31%	41%	43%	20%
Other	3%	19%	6%	2%	0%	65%
Number of responses	351	25	156	44	7	39

Table 6.34 Cross-tabulations of employment status against proportion of respondents in the SROS set doing each activity at least once a week in the warmer months (n=247)

Activity	Paid employment /self-employed	Unemployed or seeking work	Retired	Looking after family and/or home	Full time student	Long term sickness/ disabled
Hanging washing out	34%	40%	41%	76%	18%	33%
Entertaining visitors	16%	10%	18%	24%	18%	15%
Keeping pets	13%	10%	11%	32%	9%	8%
Gardening	27%	12%	32%	49%	9%	13%
Growing food	12%	7%	8%	11%	0%	5%
Eating outside	24%	7%	20%	51%	0%	10%
Feeding & enjoying wildlife	18%	19%	29%	35%	0%	8%
Sitting and relaxing	43%	31%	47%	57%	27%	26%
Talking to neighbours	29%	36%	44%	73%	0%	21%
Maintaining your car	6%	0%	7%	14%	9%	3%
Exercising	14%	19%	17%	30%	9%	10%
Children's play space	14%	17%	6%	49%	9%	10%
Access route	43%	50%	26%	38%	36%	51%
Other	5%	2%	2%	5%	0%	5%
Number of responses	122	26	55	9	7	28

In the shared space only set, those respondents who are looking after home and family stand out as the most likely to use their residential outdoor space. Though for most activities they are less active than the same group who have some individual outdoor space, their levels of activity are above the averages for the whole sample. They are more likely to *talk to neighbours* and *eat*

outside and substantially less likely to use the space for *children's play* and *entertaining visitors* than those with individual outdoor space.

Retired respondents present a different picture. In the SROS set they are less likely than average to be doing all activities except *talking to neighbours*. Those in the SROS set are half as likely as the retired groups in the ISROS and IROS sets to be *gardening* or *enjoying wildlife*. The unemployed are more active and students and the long-term sick considerably more active when they have some individual outdoor space. This shows that the reduction in usage of shared spaces cannot all be accounted for by the higher proportion of these groups in the SROS set. Usage is inhibited by other factors. Employment status was included in the analysis.

6.2.4.6 Household composition

Table 6.35 shows the frequency distribution of the number of adults and children (under 19 years old) in each household.

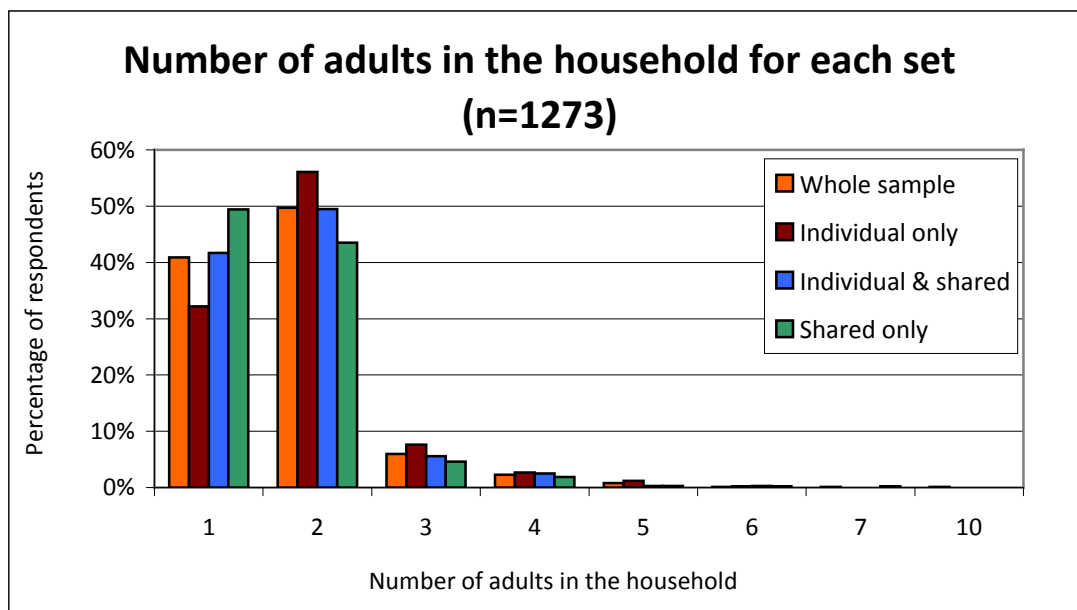
Table 6.35 Number of adults and children in each household

	How many adults (over 18 yrs old) are there in your household, including yourself?			Total number of children (under 18s) in your household?		
	Frequency	Percent	Valid Percent	Frequency	Percent	Valid Percent
Valid 0	-	-	-	753	56.6	68.8
1	521	39.1	40.9	143	10.7	13.1
2	633	47.6	49.7	152	11.4	13.9
3	77	5.8	6.0	31	2.3	2.8
4	29	2.2	2.3	10	.8	.9
5	10	.8	.8	3	.2	.3
6	1	.1	.1	1	.1	.1
7	1	.1	.1	1	.1	.1
10	1	.1	.1			
Total	1273	95.6	100.0	1094	82.2	100.0
Missing System	55	4.4		234	17.8	
Total	1328	100.0		1328	100.0	

The majority of households who answered this question have one (521, 41%) or two (633, 50%) adults. Households with larger numbers of adults may include children over 18 or older relatives or comprise unrelated adults sharing. 341 (26%) of the households include one or more children under 18 years old. 234 (18%) respondents did not respond to the questions about children. Most of these are unlikely to have children in the household. Another 443 (33%) households have children visiting regularly. 250 of these households have respondents aged over 50 who are most likely being visited by their grandchildren. Younger respondents may be separated from their own children or be visited regularly by the children of their siblings or friends.

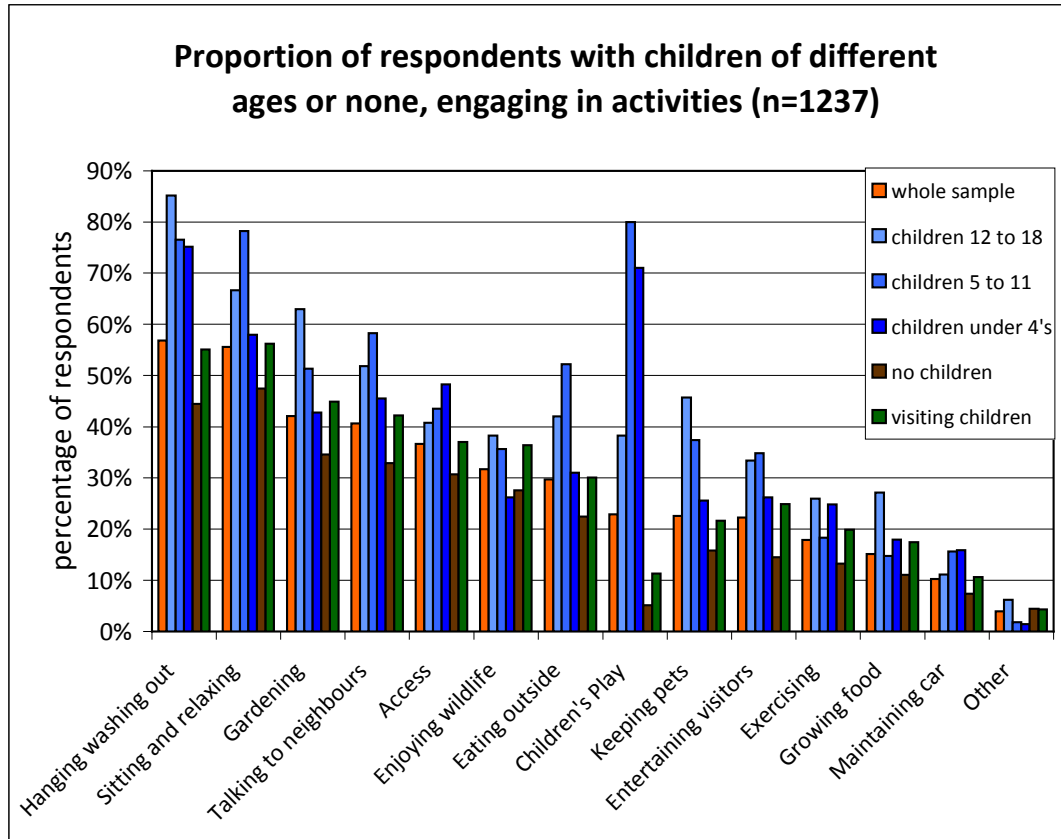
Table 6.36 (Appendix A6.3) and Graph 6.20 show that the proportion of households with a single adult increases from 32% to 49%, and the proportion with two adults, falls from 56% to 44%, as type of ROS moves from individual only, to individual and shared, to shared only.

Graph 6.20



Graph 6.21 shows the differences in activity between households with resident children of different ages, visiting children and no children.

Graph 6.21



Respondents with no resident or visiting children are less likely to do any activity at least once a week when compared to the whole sample. Those with resident children are the most likely to use their residential outdoor space every week. Respondents with children aged 12 to 18 are the most likely group to be *hanging washing out, gardening, growing food* and *keeping pets*. 80% of those with children aged 5 to 11 use their residential outdoor space for *children's play*, 77% *hang washing out* and they are the most likely group to *sit and relax, talk to neighbours* and *eat outside*. Those with children under 4 have only slightly higher than average rates of most activities, apart from *hanging washing out* (75%) and *children's play* (71%) and a lower rate of *enjoying wildlife*. Visiting children have a smaller effect, but this may be

because in many cases they visit less often than once a week. It is clear that those with children, in or visiting the household, tend to make more frequent use of their residential outdoor space than those with no regular contact with children. 31% of households with access to both individual and shared outdoor space include at least one child under 18 years old. This proportion is 19% for those in the sample with individual outdoor space only, 17% for those with shared space only and 14% for those with no outdoor space. Having children does not appear to explain the greater activity level of those with individual residential outdoor space only, but it may be a factor in explaining the differences between the two sets with some shared space.

6.2.4.7 Stage of life

The variables of household composition and age were examined case-wise for the whole sample using Ragin's fsQCA software. The groups showing the highest rates of usage are given in Table 6.37. A high rate of usage is defined as doing four or more different activities at least once a week in the warmer months.

Table 6.37 Probability of high rates of usage against household composition and age

Group	Probability of high rate of usage
Middle aged single adult (42-53 yrs) with resident children	0.93
Established and middle-aged adult (30-53 yrs) couples with resident children	0.83
Mature and older couples (54-77 yrs) with visiting children	0.71
Mature couples (54-65 yrs) with no children	0.55
Established adult (30-41 yrs) couples with visiting children	0.5
These groups represent 45% of respondents with high usage	

This shows that 83% of couples aged between 30 and 53 with children under 18 at home, and 93% of single adults with children at home use their outdoor

space for four or more different activities at least once a week. Some groups with only a small number of representatives show similarly high probabilities (over 80%) of high usage. These are young (under 30 years) single adults with children (80%), mature and older couples (54 – 77 years) (with or without contact with children) and single mature and older adults with no regular contact with children. Young couples with children have a lower probability (64%) than young single adults with children. These two groups are represented by only 14 respondents, however, so this difference may not be significant. All other groups have lower proportions using their outdoor space this often. All groups aged less than 42 with no contact with children show less than 50% probability of high usage of their ROS. Elderly couples show a higher probability of high usage than equivalent elderly single adults. The differences between single adults and couples are not significant, though they do show some differences in types of activity.

The results of this analysis agree with previous findings (Cooper Marcus, 1975; Cooper Marcus and Sarkissian, 1986) that the groups who are most likely to use their residential outdoor space are those with children under 18 living at home and mature and older adults. Stage of life is therefore significantly linked to the rate of usage of residential outdoor space.

6.2.4.8 Summary of personal attributes and usage

Usage of private, residential outdoor space is significantly greater for two groups of respondents. Those of any age looking after family or home, especially when they have children, show much higher rates of usage of shared ROS than any other group, though still less than the equivalent group with some individual space. Those who only have access to SROS are much

less likely than those with access to individual ROS to let their *children play* in the space or to *entertain visitors*. Mature and older adults are the second high usage group, but are significantly less active where they have no individual ROS. Other groups that may spend more time at home than those in full time employment; the unemployed, long-term sick and students, report lower than average levels of most activities. Long-term sick, disabled people and students in the SROS set have considerably lower levels of activity than other groups. Those in paid employment are most active in their residential outdoor space when they have resident children or are older than 30 years old.

The amount that respondents use their residential outdoor space is strongly related to their stage of life and employment status. This analysis has shown, however, that groups of respondents with similar characteristics use their residential outdoor space less often and for fewer activities if they have no access to individual residential outdoor space.

6.2.5 Attributes of the surrounding area

The character of the area surrounding the dwelling may influence how much residents use their outdoor space, particularly the proximity of public open space. This section explores attributes of the immediate surrounding area, within 300m (10 minutes walking distance). Cross-tabulation tables not shown here are in Appendix A6.4.

6.2.5.1 Size of settlement

69% of the whole sample are located in the centre of a city or large town (>2km radius), 18% in a small to medium sized town (1-2km radius) and 13% in a small town or large village (300m – 1km). A higher proportion of respondents

with access to shared ROS only, live in urban centres (80%, small to medium towns 13%). The cross-tabulation of settlement size against usage (Table 6.38) shows that activity levels are lower in the urban centres than elsewhere.

Table 6.38. Cross-tabulations of settlement size against proportion of respondents in the SROS set doing each activity at least once a week in the warmer months (n=257)

	City/large town centre (not enclosed by 2km radius)	Small/medium town (1-2km radius)	Large village/small town (300m-1km radius)
Hanging washing out	25%	36%	38%
Entertaining visitors	9%	21%	19%
Keeping pets	7%	13%	19%
Gardening	6%	23%	33%
Growing food	1%	15%	5%
Eating outside	4%	26%	14%
Enjoying wildlife	10%	23%	38%
Sitting and relaxing	21%	38%	33%
Talking to neighbours	26%	46%	38%
Maintaining car	4%	10%	5%
Exercising	8%	28%	29%
Children's play	9%	13%	5%
Access	38%	38%	33%
Other	3%	8%	0%
Number of cases	209	31	17

These differences are particularly strong for *gardening*, *eating outside* and *exercising*. Settlement size is dichotomised as settlement > 2km radius and settlement < 2km radius.

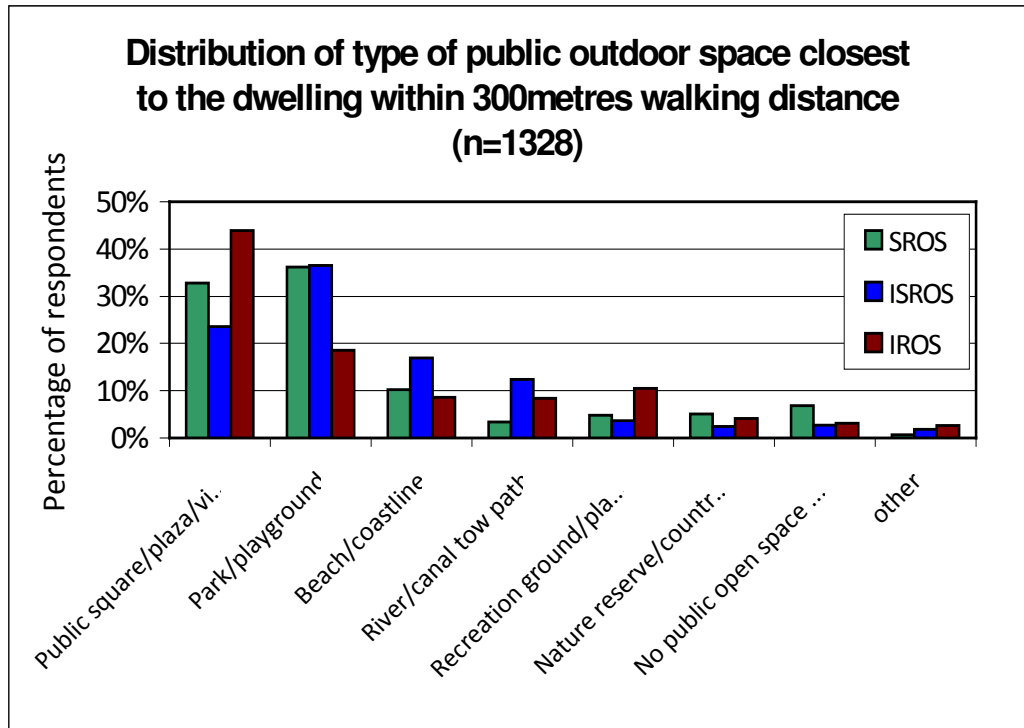
6.2.5.2 Residential location

Distance from the nearest shops was used to differentiate between dwellings close to town and city centres and those on larger housing estates further from the centre. 58% of respondents live within 300m of the nearest shop. They show lower rates of *gardening*, *eating outside* and *enjoying wildlife* (Table 6.39 in Appendix A6.4).

6.2.5.3 Nearby public outdoor space

Public outdoor spaces within 300m of the dwelling (measured along the most direct walking route) were identified and assigned a type (Section 3.3.2.4).

Graph 6.22



Graph 6.22 and Table 6.40 (Appendix 6.4) shows the distribution of the different types of public outdoor space. This graph shows the closest public outdoor space measured along the shortest walking route. 4% of the whole sample have no public outdoor space, apart from streets, within a 300m walking distance. A higher proportion (7%) of residents in the SROS set is in this situation than in the other two sets. Over a third of the whole sample (36%) has a square or plaza and 27% a park or playground within this distance. The main difference between the sets is that those with access to both shared and individual outdoor space (ISROS) are more likely to be close to a square or plaza (unfenced and mainly hard surfaced, but including village greens) than to a park (mainly green with an enclosed boundary) or playground.

Table 6.41 Cross-tabulations of public open space within 300m against proportion of respondents in the SROS set doing each activity at least once a week in the warmer months (n=257)

	No public open space except streets	Any public open space within 300m
Hanging washing out	30%	26%
Entertaining visitors	0%	11%
Keeping pets	5%	8%
Gardening	0%	11%
Growing food	0%	3%
Eating outside	0%	8%
Enjoying wildlife	30%	12%
Sitting and relaxing	25%	22%
Talking to neighbours	30%	27%
Maintaining car	5%	4%
Exercising	0%	12%
Children's Play	15%	8%
Access	40%	35%
other	15%	7%
Number of cases	17	240

Cross-tabulation against usage (Table 6.41) shows that proximity of outdoor space has little effect on *sitting and relaxing*, *talking to neighbours*, *maintaining a car* or *keeping pets*. The only activities that are done by a higher proportion of residents with no nearby public outdoor space, compared to those with some, are *enjoying wildlife* and *children's play*. Other activities are done less by these residents. These results seem to say more about the type of residential outdoor space that is in this situation than the availability of public outdoor space, but do suggest that where there is no nearby public outdoor space there are fewer opportunities for enjoying wildlife and children's play away from home. Table 6.42 (Appendix 6.4) suggests that being close to a park or playground (the largest group) does offer an alternative place to the ROS to go to *enjoy wildlife* and *sit and relax*, but has no impact on *children's play*. A nearby recreation ground (mainly grass), nature reserve or common is, however, strongly linked to reductions in *children's play* at home. So is a

nearby square, plaza or village green. The proximity and type of public open space appears to have some effects, but these are conflated by type of residential outdoor space available and household composition. These data can be used to explore the situation in specific developments, as in Chapter 7, but are not included in the analysis.

6.2.6 Factors which stop people using their outdoor space

Respondents were asked if anything stopped them or members of their household, going out into their outdoor space. They were offered 14 possible deterrents.

Table 6.43 Proportion of respondents citing each factor which stop them and their families from entering their residential outdoor space (n=1328)

	Shared residential outdoor space only	Shared and Individual ROS		Individual residential outdoor space only
		Shared	Individual	
Weather	47%	34%	52%	69%
Lack of privacy	45%	28%	21%	20%
Noise	27%	18%	20%	21%
Unattractive	28%	12%	7%	8%
Lack of space	25%	10%	19%	10%
Neighbours	20%	14%	10%	14%
Poor maintenance	18%	10%	4%	6%
Fear of attack	17%	7%	2%	3%
Fear of strangers	15%	8%	2%	4%
Poor access	14%	5%	2%	3%
Air quality	13%	4%	7%	5%
Unsuitable for children	12%	7%	7%	4%
Other	11%	3%	1%	4%
The effort	10%	4%	1%	3%
Fear of falling	6%	2%	4%	3%

The weather was the most frequently mentioned deterrent, particularly in individual residential outdoor space. Lack of privacy and noise were the next most frequently mentioned reasons in all the sets. All deterrents apart from

weather were cited by a significantly higher proportion of respondents in the SROS set than in the other sets. Lack of privacy and unattractiveness of the space are particularly strong concerns of respondents in this set and they are more likely to be fearful of strangers or attack. Even air quality is mentioned more often by respondents in this set, compared to the others. This raises questions about the placing of developments near major roads and building designs that trap poor quality air, which are beyond the scope of this thesis. Respondents who have access to both shared and individual ROS show similar levels of concern about deterrents as those with individual outdoor space only. Lack of privacy, their neighbours, poor maintenance, unattractiveness and fear are more common barriers to use of their shared space than of their individual space. More of them mention lack of individual space than lack of shared space. The responses to this question show that more of those respondents who have access to shared ROS only, perceive barriers to using this space than those who have some individual ROS. As discussed in Section 5.3.4 the written answers to questions A4 and A5 support these concerns, which are expressed more often by those in the SROS set than by respondents in the other two sets.

6.3 The key factors influencing usage of residential outdoor space

FsQCA analysis of the key attributes identified in this chapter was carried out in groups as shown in Table 4.7. Variables were eliminated by minimisation as shown in Section 4.4.1.1 (Tables 4.5 and 4.6).

The following variables were eliminated in this way from all groups:

Era of development

Boundary enclosure

Length of residence

Social economic status

The analysis gives the following results:

Combinations of factors giving SROS sets in which all members do four activities at least once a week in the warmer months, that is, raw consistency = 1. (These sets form 22% of the SROS set, the remaining 1% members of the SROS set with high usage are in sets of cases with raw consistency < 1):

1. Area per dwelling > 160 m² + greenness > 20% + maximum floor level of two storeys + no concerns about lack of privacy or noise

This set forms 39% of the higher usage group.

2. City centre flat + no concern about noise

This set forms 22% of the higher usage group.

3. Flat + ground floor or basement + respondent retired or looking after home + greenness > 20%

This set forms 13% of the higher usage group.

These three sets of factors account for 74% of the group where all respondents report this higher rate of usage (16% of the SROS set).

These three sets are linked with higher than average levels of usage of shared space. All the other attributes discussed in this chapter were eliminated from this analysis during minimisation. This means that they are not strongly associated with the general level of usage, though some of them

are associated with the level of specific activities as discussed in this chapter. For example, lack of enclosure is linked with low levels of gardening.

Combinations of factors giving sets where no members with only shared space do four activities at least once a week in the warmer months, that is raw consistency = 0 (76% of the SROS sample):

1. Area per dwelling < 160 square metre + no children in the household + number of dwellings sharing > 20

This describes 46% of the lower usage group.

2. Flat + lowest floor level above ground level

This forms 19% of the lower usage group.

3. Flat + concern about privacy + number of dwellings > 20

This is 16% of the lower usage group.

These three sets account for 79% of the lower usage group (50% of the SROS set).

This analysis shows that where respondents who only have shared ROS have sufficient area per dwelling (>160 m²) and at least some greenness (>20%) they are more likely to be active in their ROS, especially if the maximum floor level is no greater than two. These are attributes that are unusual in cities, where land prices are high. Those respondents who live in urban centres and have few concerns about noise are likely to use the shared ROS regardless of level of greenness. The third group who are more likely to use their shared ROS are those who live in ground floor or basement flats, are retired or looking after the home and have some greenness (>20%).

If area per dwelling is less than 160 m² and more than twenty dwellings share the ROS, respondents are less likely to use their SROS, especially if they

have no children. Respondents in flats above ground level or where noise levels or lack of privacy are an issue are also less likely to use their SROS.

The focus of this research is on how shared residential spaces can be better designed to maximise the amount that residents can use them. This chapter has identified several factors, which are linked with variations in the amount that respondents use their shared, residential outdoor space. The most important attribute of the space itself is the area provided per dwelling. In this sample there is a clear difference in levels of activity above and below 160 square metres per dwelling (this includes parking provision for one car per dwelling and the access roads and footpaths). There is a group of respondents who live in central areas of cities that say that they appreciate having any residential outdoor space at all. They are likely to make good use of whatever ROS they have access to, as long as they are not suffering from noise problems. In Chapter 5, however, it is made clear that if the amount of residential outdoor space is significantly lower than 160 square metres per dwelling, usage is greatly improved by providing individual residential outdoor space. Provision of balconies is particularly important for those in flats above ground level. Usage is lower where the number of dwellings sharing the area is greater than 20 and appears to be linked with concerns about lack of privacy. Shared residential outdoor spaces do not need to be very green, but having some green areas (>20% of total area) is linked with improved usage.

How these factors work together in different developments is investigated in Chapter 7 by comparing the features of individual developments with higher and lower rates of usage.

CHAPTER 7 LESSONS FROM SPECIFIC DEVELOPMENTS

7.1 Introduction

In Chapter 6 the attributes of residential outdoor space, residents, their dwellings and the wider local area, and their links with different levels of usage of shared residential outdoor space are explored. Features of developments associated with higher levels of usage are greenness > 20%, area per dwelling (including parking, drives and paths) > 160 m² and maximum floor level no higher than two. Many developments in urban centres are constrained for space and are more than two storeys high, though they can be designed with some green space. Usage is reported as particularly low for those living above the first floor, especially where there are more than 20 dwellings sharing the ROS and a lack of greenness. Other inhibitors mentioned are lack of privacy and noise problems. How these different factors interact with usage is explored in this chapter by considering the attributes and usage levels of nine individual developments.

7.2 Selection of developments

The majority of the post-2000 developments in the sample are a mixture of flats with shared residential outdoor space, and houses with individual back gardens. From many of these developments the bulk of the responses came from residents of houses and little information was obtained about the shared ROS. The developments selected in this chapter are ones where at least six responses were obtained from residents who have access to shared residential outdoor space and little or no individual ROS. They have also been chosen to represent a range of usage levels and layout types. They are presented in the order of usage level, measured as the percentage of residents doing at least

four activities in their residential outdoor space at least once a week. This is measured across all the responses from each development. Percentages given in the following sections are of the respondents who have access to shared space, and exclude those who only have access to individual space.

7.3 Example developments

7.3.1 Coopers Road, Southwark, London

This joint venture between the Peabody Trust and the London Borough of Southwark is a phased replacement of a series of 1960s tower blocks by mixed houses and flats around enclosed shared courtyards. The roof of a remaining tower block can be seen on the right hand side of Figure 7.3 (just above the middle). Each courtyard has a four-storey block of flats on the North side (to minimise shading of the courtyard) and another either on the East or the West. Eight or nine houses with small back gardens close the other two sides. Between 64 and 72 dwellings share each courtyard. On-street parking is provided in lay-bys.

Sixteen questionnaires were received from this site, ten from full tenants of Peabody Trust and five from shared equity owners (one gave no response to any demographic questions). This is a response rate of 14%. Thirteen of these responses are from residents of flats, which, as shown in Figure 7.2 (the buildings on the left are houses), all have either an individual patio, or a balcony that also provides access. The age range of the fifteen respondents who answered demographic questions is between 25 and 51; thirteen are women. Ten of the women and one of the men are living with another adult and one woman with two adults. Seven of the couples have children living in the household, three couples have regularly visiting, but no resident children.

Figure 7.1 Cooper's Road, Southwark, London



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Figure 7.2 Cooper's Road, Southwark, London – inner courtyard



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Figure 7.3. Cooper's Road, Southwark, London - aerial view

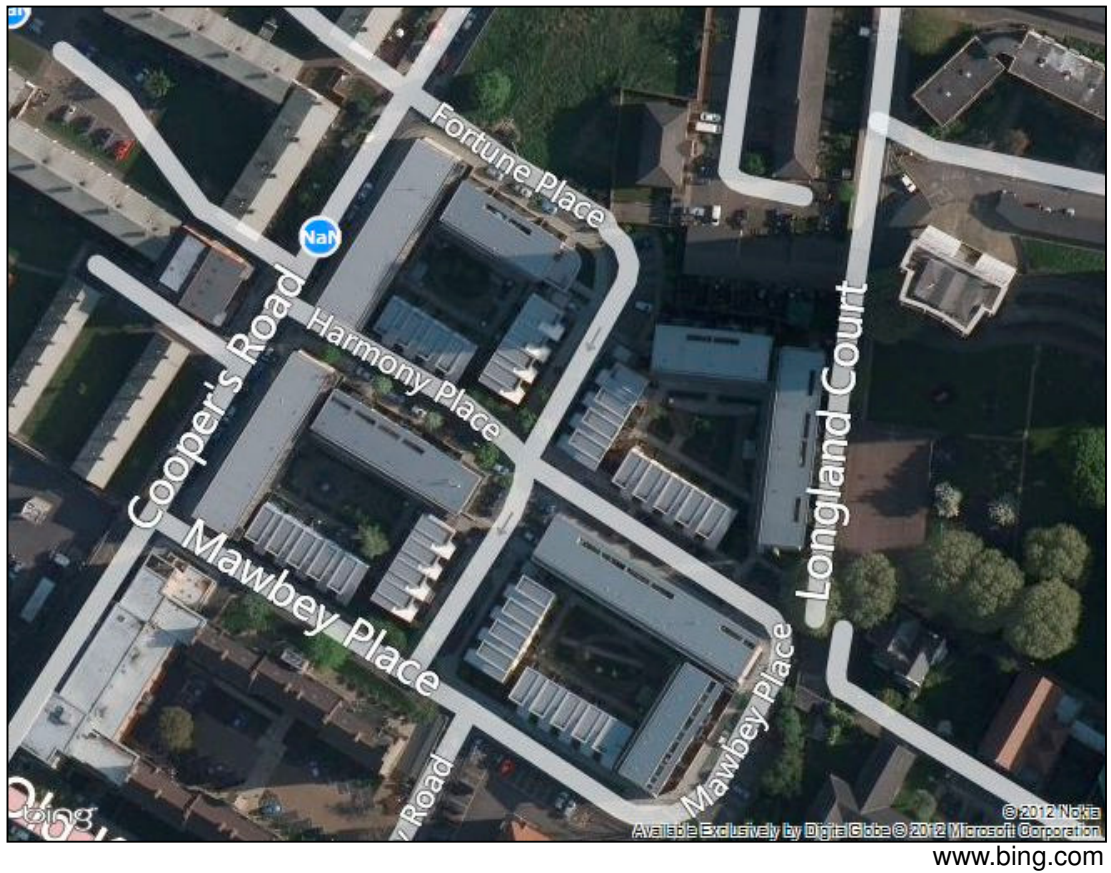


Figure 7.4 Cooper's Road, Southwark, London - map



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75% of the respondents have regular contact with children (one couple, one single man and the household of three adults have none, plus one not answering these questions). This is a higher proportion of respondents than from any of the other developments surveyed. Half the respondents are in paid employment, four are looking after home or family and three are unemployed.

Fourteen respondents (87%) *hang washing out* and nine (56%) *talk to neighbours* in their ROS at least once a week in the warmer months. These are higher rates than average for the ISROS set, which are 50% and 40% respectively (Table 5.2). Seven respondents (44%) *sit and relax*, which is lower than the ISROS set average (61%). Six (46%) of the flat owners report doing more than four activities a week in their residential outdoor space.

All bar two of the respondents gave written comments in response to questions A4 (What do you like most about your outdoor space?) and A5 (What would you change about your outdoor space if you could?).

Respondents are very appreciative of having their own balconies.

I can dry my washing on the privacy of my own balcony & store my children's bikes and toys. (CR46)

Having an outdoor space makes a huge difference. We can eat outside and grow plants. It makes our flat seem much larger and the view is great. (CR101)

The balcony gives me a chance to get fresh air & sun which feels good for health. I can grow plants - v good for well being & environment. Shared community courtyard - great place for kids from all the flats to play. Gives them a safe place, provides a splash of green & gives a nice community feel - a happy feeling. And there's a chap who does Tai Chi out there early mornings - in the middle of South London! - Great! (CR53)

This last respondent wrote a long paragraph at the end of the questionnaire about the importance, particularly for children, of having access to sun, fresh

air, space and plants. She also comments about the pleasure of seeing children of all ethnicities playing safely together in the courtyard and concludes:

Oh so they climb the front of the flats instead of trees but that's ingenuity for you and for London I feel that we are very, very lucky. (CR53)

Several people appreciate having a safe place for their children to play, but it is clear from other respondents that the courtyards are used little by adults because of the children. The noise that they make appears to be amplified by the courtyard layouts.

As two sides of the courtyard have four bedroom houses (9 in total) and the 1 and 2 bedroom flats on the other sides this adds up to a great many children in a small area, who trample the plants & grass. It also makes it impossible for the older people to enjoy the courtyard and benefit from it. (CR 49)

More of it! The communal space is hard to use as it's full of screaming kids.' (CR 91)

Every flat dweller reported that noise levels prevent them from going into the shared space. Five respondents said that noise prevents them from going into their individual space as well. Three respondents think that the noise would be less annoying if the courtyard was bigger and one suggests a curfew for children. The area of shared space per dwelling is between 34 and 50 m², which is low. Other reasons were given for not using this shared space. Neighbours and lack of privacy were cited by eight respondents and fear of strangers by five (four from the same courtyard).

Unattractiveness was mentioned by five people and two respondents would like their courtyard greener with more trees and seating. Three respondents from the same courtyard (where four respondents are afraid of strangers) named poor maintenance. There may be particular problems in this courtyard that the other one is not suffering from.

It is clear that noise is a major issue in these courtyards and that children are the main users. Adults appreciate having the space and a green area, but are largely prevented from using the space. Noise levels are exacerbated by the smallness of the courtyards and closeness of the surrounding buildings. This probably accounts for the lower than average incidence of the activity of *sitting and relaxing*.

Those on the ground floor with a small garden (similar in area to the balconies) all wish for a larger area.

The orientation of the flats with the balconies all facing into the courtyard ensures that they all get sun at some part of the day, but the overlap of the buildings at the corners disadvantages some flats, as can be seen in Figures 7.2 and 7.3. One respondent complains that:

In front of my balcony I have a plain brick wall that blocks me and my families view, this is because the design team did not take into consideration the old block (my block) when building the new block. (CR46)

This is a limitation of the design. Overall, the creation of a secure courtyard where children can play together is much appreciated by families, but the smallness of the courtyard means that children are in sole possession and that noise is an issue. This is balanced to some extent by every dwelling having some individual residential outdoor space. There appears to be little opportunity for other activities in the shared space, especially *gardening, sitting and relaxing and enjoying wildlife*.

7.3.2 18th Century terraces, Bath

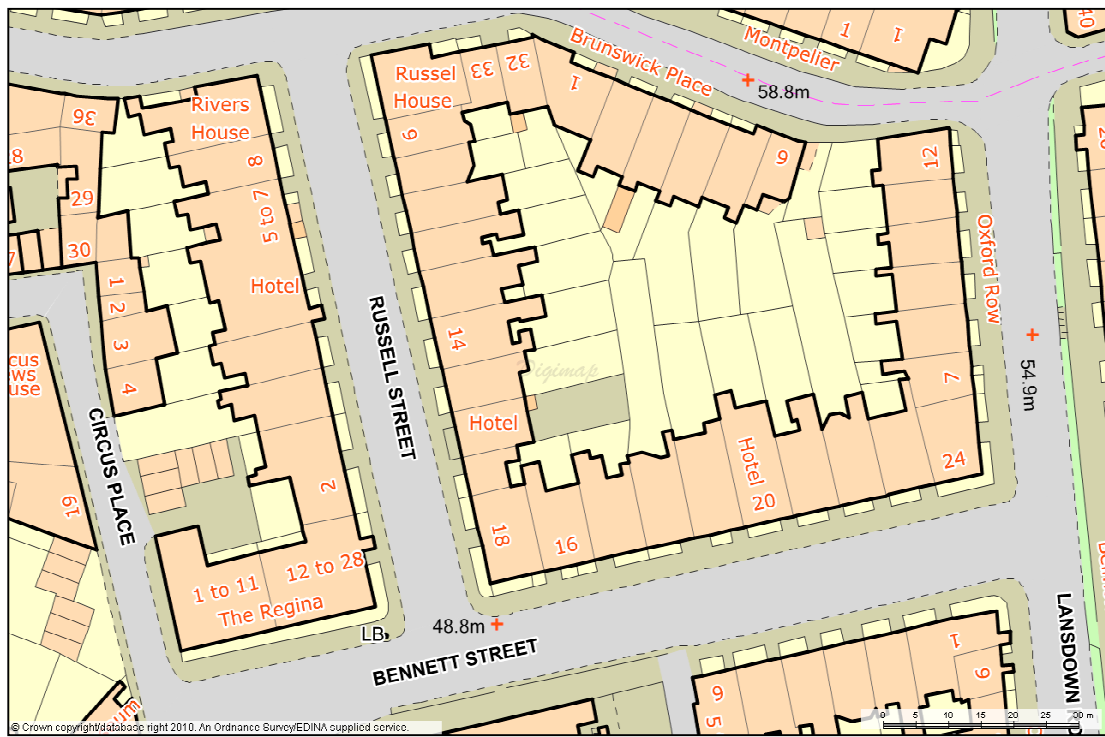
Many of the 18th Century terraces have been converted into flats, whose residents have shared use of the back garden. They are mainly organised in perimeter blocks, with some free-standing terraces (and crescents). A sample of streets in the centre of Bath was surveyed. The area available for each dwelling is highly variable, but the average is similar to Coopers Road (Section 7.3.1). The number of dwellings sharing any one space is, however, much lower: from two to twelve.

Figure 7.5 18th Century terraces, Bath - aerial view



It is clear from the aerial view (Figure 7.5) that the back gardens are green with mature trees. Twenty-three responses were returned, a response rate of 23%. Seventeen respondents live in flats and three in terraced houses.

Figure 7.6 18th Century terraces, Bath - map



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All the house dwellers and eleven of the flat residents have their own individual outdoor space. For the flat dwellers these are small patios or balconies. The responses are evenly spread over the age range, apart from the youngest: one female student sharing with two others and with no contact with children and the oldest: a 97 year old woman living alone and a couple in their nineties, also with no regular contact with children. Twelve of the respondents (7 living with another adult) are in paid employment, three are retired (all couples) and three long-term sick (all living alone). There are no unemployed. Only three respondents (one single), all aged between 46 and 59 years, have children living at home and six others (three aged 36 to 41 years and three aged 66 to 77 years) have regularly visiting children.

Nineteen respondents answered questions A4 and A5. Five are concerned about being overlooked and five would like to have more space, but as one responded to A4:

That there is some! Space in Bath is at a premium. (JR53)

Half of the respondents who live in flats, and only have access to shared space, do four different activities in their space at least weekly. These three respondents all use their space to *garden*, *enjoy wildlife* and *sit and relax*. These first two activities are unusual in shared ROS, the average rates being 12% and 16% respectively and the average for *sitting and relaxing* in the SROS set is 27% (Section 5.2.1.2, Table 5.2). This is a very small sample, but does suggest that where a residential outdoor space is shared by a small number of dwellings it can be possible to claim part of it for gardening and relaxation. This is harder where a large number of households share the space. Two other flat dwellers use their outdoor space rarely or not at all. One gives a list of reasons why she does not go into the shared space. It is unattractive, poorly maintained and lacks privacy and she is fearful of attack and strangers. The other is a full time student and gives no reasons. One resident of a flat has no outdoor space at all, but comments:

I don't currently have any outdoor space – but as a busy single person with an urban lifestyle I don't really miss it too much. I do love my fabulous views across the Georgian terraces to the hills on the outskirts of Bath. (JR98)

This supports the suggestion that there is a segment of the population, who are young, childless professionals or students, for whom having access to their own residential outdoor space is not important. Even if they have residential outdoor space they may not make much use of it. The use of the word 'currently' suggests that this respondent does not expect to be staying in her present dwelling long-term.

7.3.3 Croftleigh Avenue, Purley, Croyden

Built in the 1950s, these blocks of four, six or mainly eight maisonettes are surrounded by grass and mature trees. The blocks are well spaced to avoid overlooking. The residential outdoor space is shared by all sixteen blocks. It has a boundary on three sides, but public footpaths lead into it and it is completely open to the road, so feels like public space. Area per dwelling is 240 m². The blocks are orientated so that the windows face East/West or North-East/South-West.

Seven questionnaires were returned, giving a response rate of 21%. Five were from single women; one aged 33 years with two children at home and two others, aged 62 and 76 years, with regularly visiting children. The other two women were aged 52 and 71 years. All the women have been in residence for nine years or more and are social tenants bar one private tenant. The other two responses were from men; one aged 31 years, lives with a partner and two children and is a private tenant, recently moved in; the other is an owner occupier living with three other adults and is aged 42 years. This is the only respondent living in a first floor maisonette. All the other respondents are on the ground floor. These responses suggest a fairly mixed, stable community.

Five of the six respondents who answered the usage question (A6), do at least one activity (as well as *access*) most days. Use by *pets* and *talking to neighbours* are reported by three respondents and *enjoying wildlife*, *children's play* and *hanging washing out* by two. Three (50%) respondents do four or more activities at least once a week. This proportion is probably because all the maisonettes have a small area of individual space that is clearly theirs.

Figure 7.7 Croftleigh Avenue, Purley



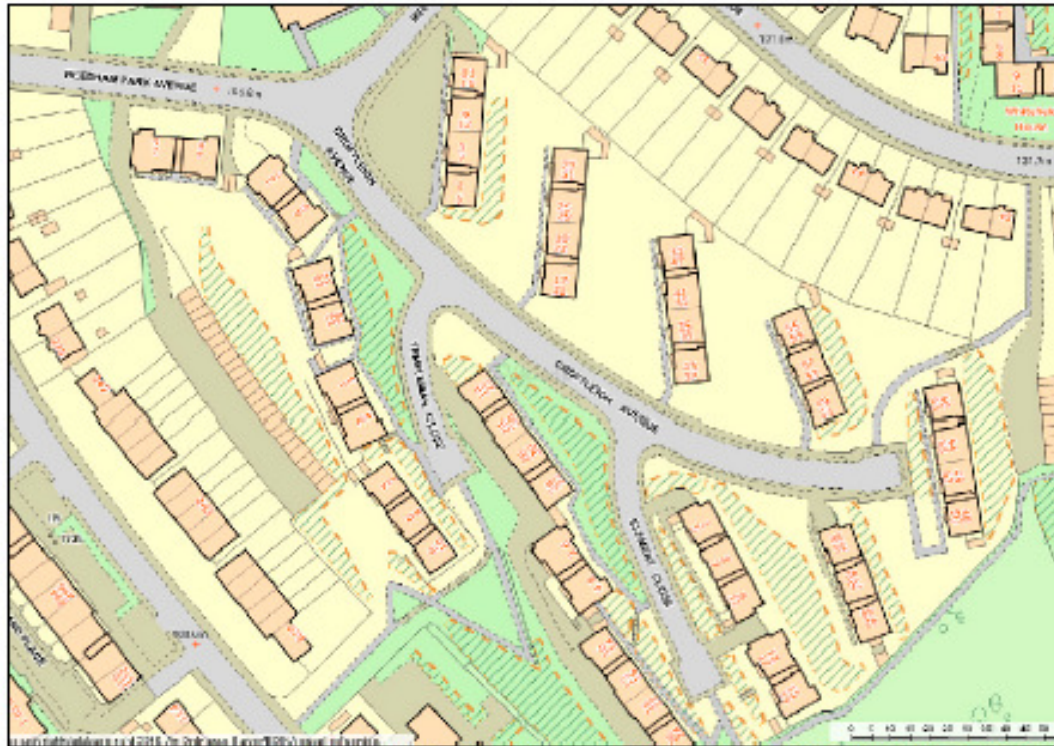
www.leaders.co.uk

Figure 7.8 Croftleigh Avenue, Purley - aerial view



www.bing.com

Figure 7.9 Croftleigh Avenue, Purley – map



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All seven respondents gave responses to questions A4 and A5. They all appreciate the greenness of the surrounding area and the mature trees.

Lots of grass and trees – very peaceful (PU19)

It makes me feel better, love looking out at the trees in the changing seasons. (PU5)

Concerns were expressed about dog fouling making the space unsuitable for children’s play and that the space was nobody’s and therefore not looked after properly. Three respondents reported that they are prevented from using their shared space by neighbours, lack of privacy and fear of attack or strangers. Neighbours and lack of privacy were cited by two more.

I live on a council estate with green grass between the blocks. I would give everyone a small fenced area for an allotment or garden. This is because communal space is nobody’s space: it is used by nuisance people & covered with litter. (PU4)

This expresses some of the issues that arise in spaces that are 'confused' (Coleman, 1964, 1984). This is the residential outdoor space for these maisonettes and it is open to the public so what can be done in it is unclear, especially as the local council owns the land. There is no clarity about where the boundary between private and public outdoor space lies, as this public space goes right up to people's front doors. So there is no transitional area between public and private space (Madanipour, 2003; Petticrew, 2009). One resident claimed that they could not 'sit out' because it is a communal area.

7.3.4 Owens Way, Oxford

This is a mixed estate of houses and flats about two miles from the centre of Oxford and completed in 2007. The houses have enclosed rear gardens and some have open plan front gardens. The flats are grouped around three grassed open spaces. There are 111 dwellings in this development and the area per dwelling is 143 m². This estate is more spacious than Coopers Road (Section 7.3.1) and gardens are bigger. Not all the flats have balconies.

Figure 7.10 Owens Way, Oxford



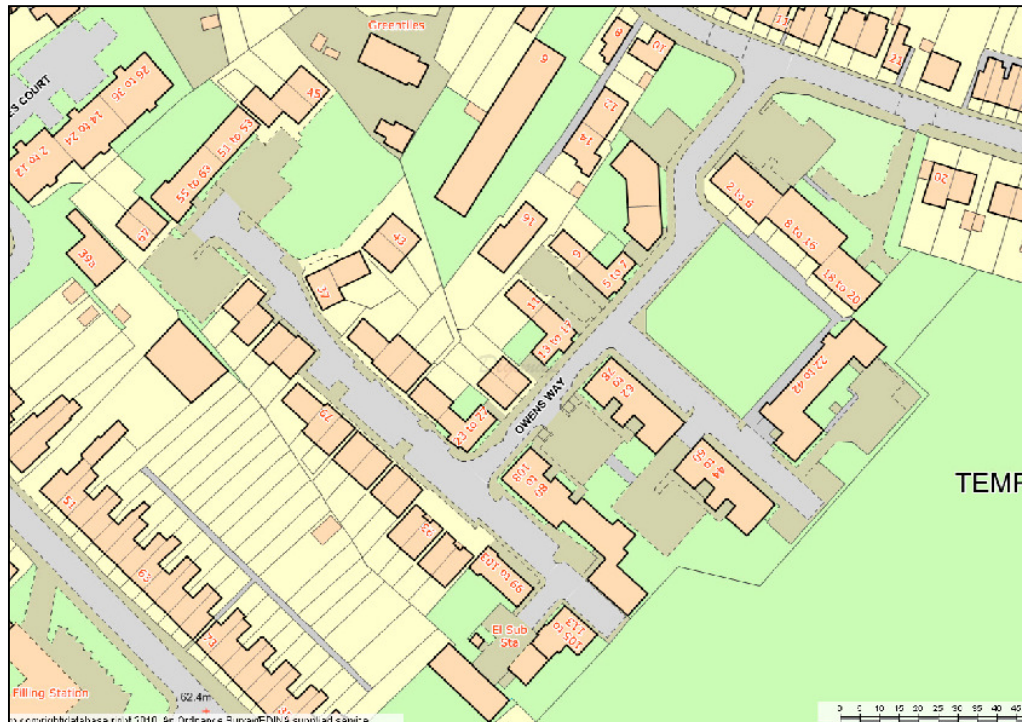
www.connells.co.uk

Seventeen of the thirty-two responses (29% response rate) came from respondents living in flats, nine renting from the housing association and eight with shared equity. Only three of these respondents are over forty years old, which is a younger age profile than average (see Section 6.2.4.1). This is to be expected in a new development of flats. Eleven of the flat dwellers are living alone, four with children and one with regularly visiting children. Three of the six couples have children in the household. Most of the house dwellers are in couples with shared equity and aged between 26 and 49 years. Three of these households have resident children. Most respondents are in paid employment, five are looking after children and there is one each of retired, unemployed, long term sick and a student.

Figure 7.11 Owens Way, Oxford – aerial view



Figure 7.12 Owens Way – map



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Five flat residents (29%) report doing at least four activities at least once a week in their residential outdoor space. This is a lower proportion than in the previous developments, which may be partly explained by most of the respondents being in paid employment and relatively young. Eight flat dwellers (47%) *sit and relax* and six (35%) *entertain visitors* in their outdoor space this often. Four (24%) *hang washing out* and another four (24%) *eat outside* at least once a week in the warmer months.

Fourteen respondents who live in flats answered questions A4 and A5. Most like the large grass areas and two of them say that they are clean and tidy.

Its very big, clean and well looked after (OW52)

Three respondents comment on the benefits of having a balcony.

Having room to sit and watch the world go by. Nice to have a balcony and pot plants. (OW92)

One respondent is frustrated that he does not have a balcony.

Suggestions were made for improving the grass areas with more planting and one resident thinks that it needs to be made more usable by children:

In communal garden add children's play things for kids at moment its just a small fenced green area that no one uses.
(OW105)

This respondent, a young man with three children, likes nothing about the residential outdoor space and reports that he is stopped from going out into it by all of the reasons offered except air quality, poor access and fear of attack or strangers. The main reason for not using the space reported by twelve other respondents is lack of privacy. Neighbours are mentioned by seven, noise by five, unattractiveness by five and poor maintenance by four.

Three respondents living close together in the same block are concerned about noise, neighbours and lack of privacy: one of them wants to:

Stop ball games and dogs using it. (OW91)

It seems that for most of the respondents who live in flats in this development the shared ROS provides a pleasant green view and a sense of spaciousness, but is not much used by adults. The largest space is all grass which is kept short and tidy, but offers no focus for activities: an example of ROS designed for easy maintenance rather than for use. The addition of seating arranged in small groups and some planting to create separate spaces might make this space more attractive and usable. One area could be landscaped to support children's play. This is a development with substantial grassed areas, perhaps as it matures, residents may consider working together to make them more attractive and usable.

7.3.5 Thornes Park, Brighouse

This 1970s development consists of blocks of maisonettes arranged around a series of open grassy courtyards with some trees. Thirty-six flats share the space and the area per dwelling is 90m². On two sides of the development are terraced houses with individual front gardens. A small number of flats have enclosed individual ROS, but most do not. There is a large area of allotments behind the houses.

Thirteen questionnaires were returned, a response rate of 19%; eleven from women. Eight respondents live in flats, are mainly single and aged between 47 and 64 years, apart from one 19 year old. Two of them have resident children and another two have regularly visiting children. Three of this group are in paid employment, two unemployed, two retired and one long term sick. They have either moved in within one year or have been living there for more than eleven years. Four of the five house dwellers are owners, one has been at Thornes Park since it was new. Three of them are couples, two with children and another with visiting children and one is a household of three adults. All the house dwellers are aged between 36 and 58 and in paid employment, bar one looking after the family (whose partner is in paid employment).

Six of the eight flat dwellers *hang washing out* and three *talk to neighbours* at least once a week. One does more than four activities at least once a week in the shared residential outdoor space. None of the respondents claim to have an allotment. Seven flat dwellers answered questions A4 and A5. Two enjoy the trees and birds. Four would like private space of their own. The layout makes it easy for some flat owners to personalise some space, but difficult for others. One respondent complains of lack of parking spaces and bin space.

Figure 7.13 Thornes Park, Brighouse



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Figure 7.14 Thornes Park, Brighouse – aerial view



www.bing.co.uk

Figure 7.15 Thornes Park, Brighouse – map



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This is another example of ‘confused’ space, which is neither public nor private (Coleman, 1964, 1984), but in this case most residents have no official individual space. A few respondents have personalised space around their entrances, but are not allowed to enclose it, even though some flats have a small enclosed garden. The range of activities done outside is much lower than in Croftleigh Avenue (Section 7.3.3.) where all the flats have individual balconies and there is more than twice the area per dwelling available.

7.3.6 Crown Street, Glasgow

The Crown Street development is across the Clyde from the centre of Glasgow, in the Gorbals. This was an area of typical four-storey tenements, which became severely overcrowded and associated with squalor, poverty and crime. The area was re-developed in the 1960s and the tenements replaced. In 1968, twelve linked deck access blocks were built in the Crown Street area, but within nine years, families were being moved out because of incurable damp problems.

These blocks were demolished in 1987 (www.cabe.org.uk). The Crown Street Regeneration Project was set up in 1990 and created a master-plan based on an updated model of the traditional tenement form. The area has a mix of uses and about 25% social housing. Most of the housing is in four-storey perimeter blocks with central communal gardens, interspersed with terraced housing. To cater for families with children, many of the blocks include two-storey maisonettes with individual back gardens.

Figure 7.16 Crown Street, Glasgow



Copyright Dave Cowlard

Note two remaining 1960s tower blocks behind

The streets are wide enough to provide on-street parking for between one and two cars per dwelling. Some of the parking is in the centre of the streets. Trees have been planted to soften the visual effect of this, but are not thriving. There are several high quality, public green spaces and a network of footpaths makes the estate easily walkable. Residents' fears that the development would become a rat-run were addressed by building a low wall with railings around the West and South side. This results in lack of permeability and isolates the development from the surrounding area.

Figure 7.17 Crown Street, Glasgow – aerial photo (looking North- East)



Ballater
Place

Glasgow City Council

The researcher visited Crown Street on foot several times. There is a strong contrast between the levels of maintenance within and just outside it. The Crown Street development is well maintained, clean and tidy. Immediately outside pavements are cracked, dirty, gum spattered and litter strewn; buildings are grimy and the area seems uncared for. This contrast increases the feel of Crown Street as a place separated from the rest of the city. Questionnaires were sent to residents of Alexander Crescent, Southside Crescent (the bottom left hand corner in Figure 7.17), Crown Street, Moffat Street and Ballater Place (top right hand side of Figure 7.17). The two crescents are built around Gorbals New Park for owner-occupiers. Crown

Street runs from the park towards the river. Moffat Street and Ballater Place is social housing situated further East. The public outdoor spaces at this end of the development are smaller and have less decorative planting than Gorbals New Park and little play equipment.

Figure 7.18 A row of shops immediately North of the Crown Street development



Griffin 13/02/2011 12.07

Seventeen responses were received, one from a terraced house and the rest from flat dwellers, all living above the ground floor. This was a low response rate of 13%. Another seventeen questionnaires were returned blank, one with 'I don't give a toss about outside space' written across it in thick black marker pen. This graphically demonstrates that there is a section of the population who are not at all interested in using their ROS. Possibly the residents of Crown Street have been over surveyed. The responses were evenly distributed between the different streets.

Figure 7.19 Crown Street, Glasgow, Alexander Crescent – aerial view

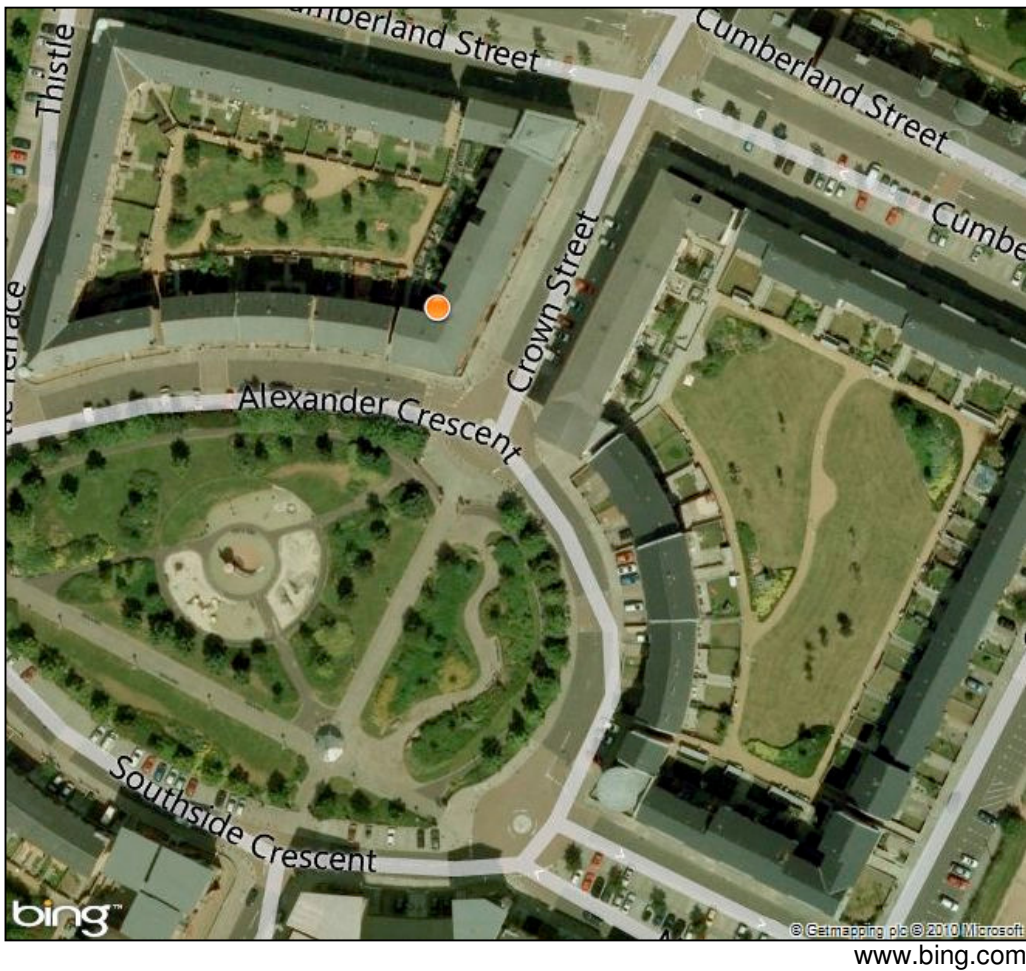
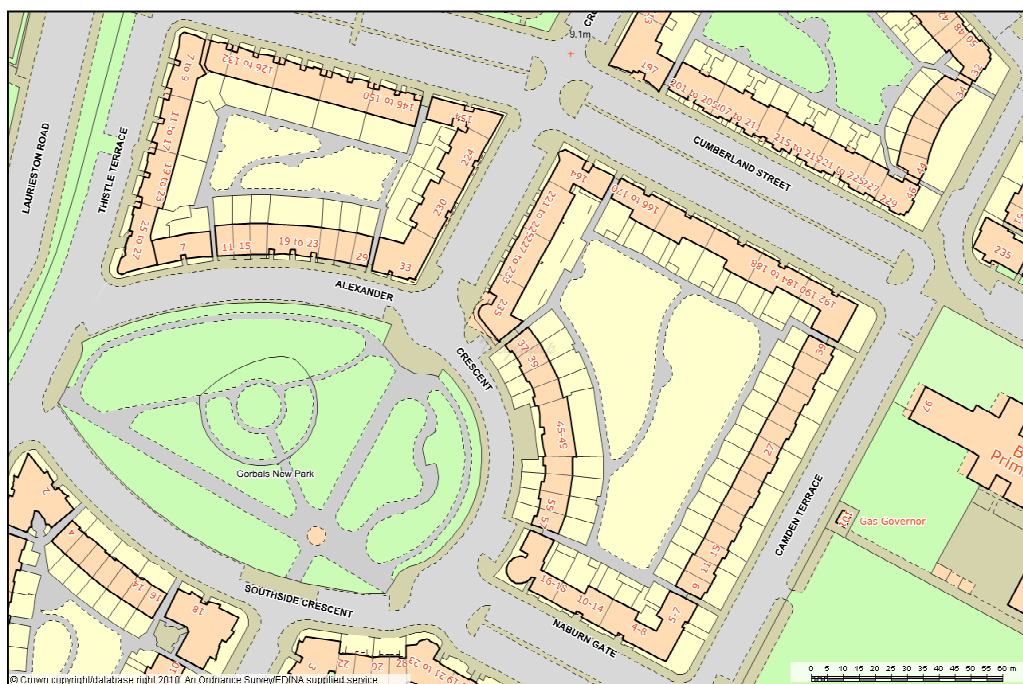


Figure 7.20 Crown Street, Glasgow, Alexander Crescent – map

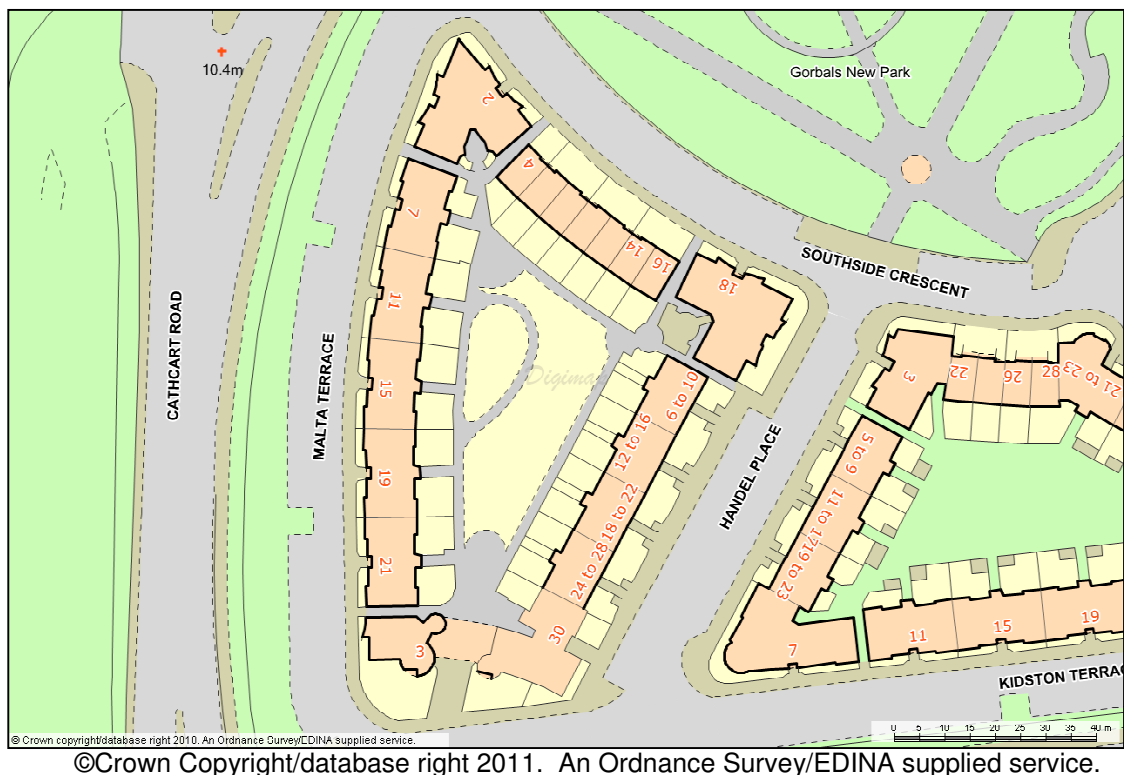


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Figure 7.21 Crown Street, Glasgow – Southside Crescent - aerial view



Figure 7.22 Crown Street, Glasgow, Southside Crescent – map



All the respondents from Southside and Alexander Crescents are owner occupiers in paid employment aged between 28 and 35 years (except one aged 45 years); half women and half men. Half live alone and half with another adult. One of these couples has children at home. Seven of the respondents from Ballater Place and Moffat Street are social renters, mainly women, one man rents privately and another is an owner. Six live alone and of the three couples, one has children at home. Five of these respondents are in paid employment, one retired, one looking after home or family and two long term sick. Five of the respondents have regularly visiting children.

Figure 7.23 Crown Street, Glasgow - Southside Crescent
Gorbals New Park is on the left



Griffin 12/12/2011 14.12

Only two of the flats have an individual balcony and one has a shared balcony. Six of the sixteen respondents who live in flats use their space to *hang washing out* (38%), five *sit and relax* (31%) outside and a different five

(31%) *talk to neighbours*, at least once a week. Four use the space to *exercise* in, three *enjoy wildlife* and another three *keep pets*. Five respondents (31%) use their residential outdoor space for four different activities at least once a week. In Moffat Street and Ballater Place a range of reasons were given for not using the space. Lack of privacy was mentioned by seven respondents and this was the only reason given by respondents who live in Alexandra or Southside Crescents.

Fifteen of the seventeen respondents answered questions A4 and A5. In Alexandra and Southside Crescents respondents appreciate having the space and that it is green, tidy and visually attractive and provides a pleasant view. Two respondents think that the shared ROS would be used more if it had a seating area. One wants somewhere to hang washing outside and says that the balcony is 'far too small for a table or any other purpose' (CS40).

Respondents from Moffat Street feel that the space is not well used. Two of them suggest that the addition of a patio with tables and chairs would give a benefit. Those in Ballater Place, who are surrounded by an open grassy space, have been disturbed by recent building work and people emptying their bins, apparently looking for aids to ID theft. One describes the space as 'clean and tidy' (CS85) and another as 'dirty and unkempt' (CS 100). This may be because the standard of maintenance is inconsistent in different parts of the space or it may illustrate differences between people's perceptions of the same space

Two interviews were recorded in the Crown Street area.

Interviewee A. Middle aged, single professional male living on the third floor overlooking Gorbals New Park.

Joe's flat is in a perimeter block where the ground floor flats have individual gardens. Flats on the higher floors have access to a small paved court that holds the bin stores (Figure 7.24). This gives on to a central area which has a grassy mound topped by several trees (Figure 7.26). There are plantings of shrubs and bulbs (Figure 7.25). A path goes around the edge which is bounded by a 1m high brick wall. Every garden has a gate out into this area. 165 dwellings surround the space and the outdoor area per dwelling is 72m². Hanging washing out is only allowed in the individual gardens and there is a 'no ball games' rule, which is sometimes ignored. Joe rarely sees adults in this central space; only young children riding bicycles or playing football. He believes it is too overlooked and sees its main functions as creating a space between the flats and providing an attractive view.

Figure 7.24 Entrance to the shared ROS at Southside Crescent



Griffin 12/02/2011 15.11

Figure 7.25 Southside Crescent - shared courtyard



Griffin 12/02/2011 15.08

Figure 7.26 Southside Crescent - shared courtyard



Griffin 12/02/11 15.10

Joe bought his flat for the view over Gorbals New Park, which is well designed and well looked after. For example, graffiti was cleaned away in a couple of days. There is a balcony on each side of the flat: the larger one overlooks the park, but rarely gets sun. It is particularly useful in the summer when the flat can get very hot. The rear balcony is a sun trap and pleasant to sit out on in the evenings after work. He only goes into the shared space to dispose of his rubbish in the bin store. When he wants to get outside he usually goes walking. There are good, well-lit walking routes in the Gorbals.

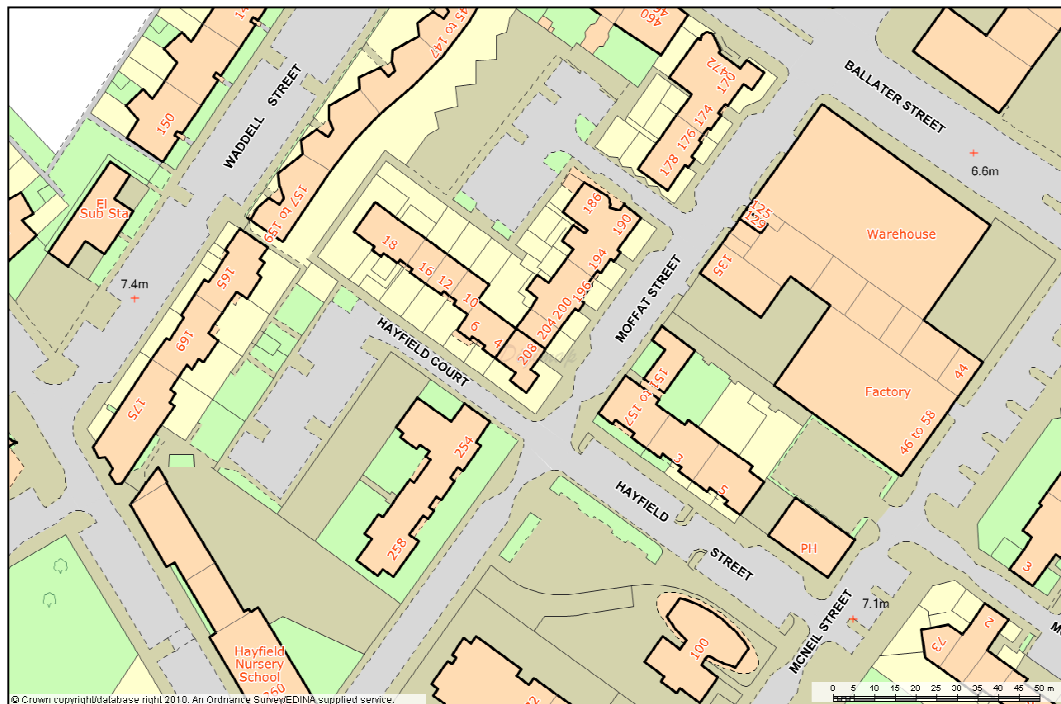
Joe remarked that the people with individual gardens do sit out in them or have barbeques [despite the gardens being just as overlooked as the shared space]. He feels that the shared space lacks a focal point. There is nowhere to sit and chat to people or to have a barbeque. If he wants to sit outside in more space than his balcony he goes to read in the park, which feels less overlooked because it has more mature trees and the flats are further away.

He talked at some length about the factors. These are the management companies who maintain the common parts. All residents pay the factors for maintenance services, once a quarter. Joe thinks that they are doing a good job; the outdoor space is clean and tidy, as are the hall and stairs. Outside woodwork is repainted every five years. Joe is concerned about the fees going up by 10 to 15% every year and about having no control about what repairs the factors choose to do. Sometimes they do things that he does not think are necessary.

Figure 7.27 Crown Street, Glasgow, Moffat Street – aerial view



Figure 7.28 Crown Street, Glasgow, Moffat Street – map



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Figure 7.29 Crown Street, Glasgow, Ballater Place– aerial view

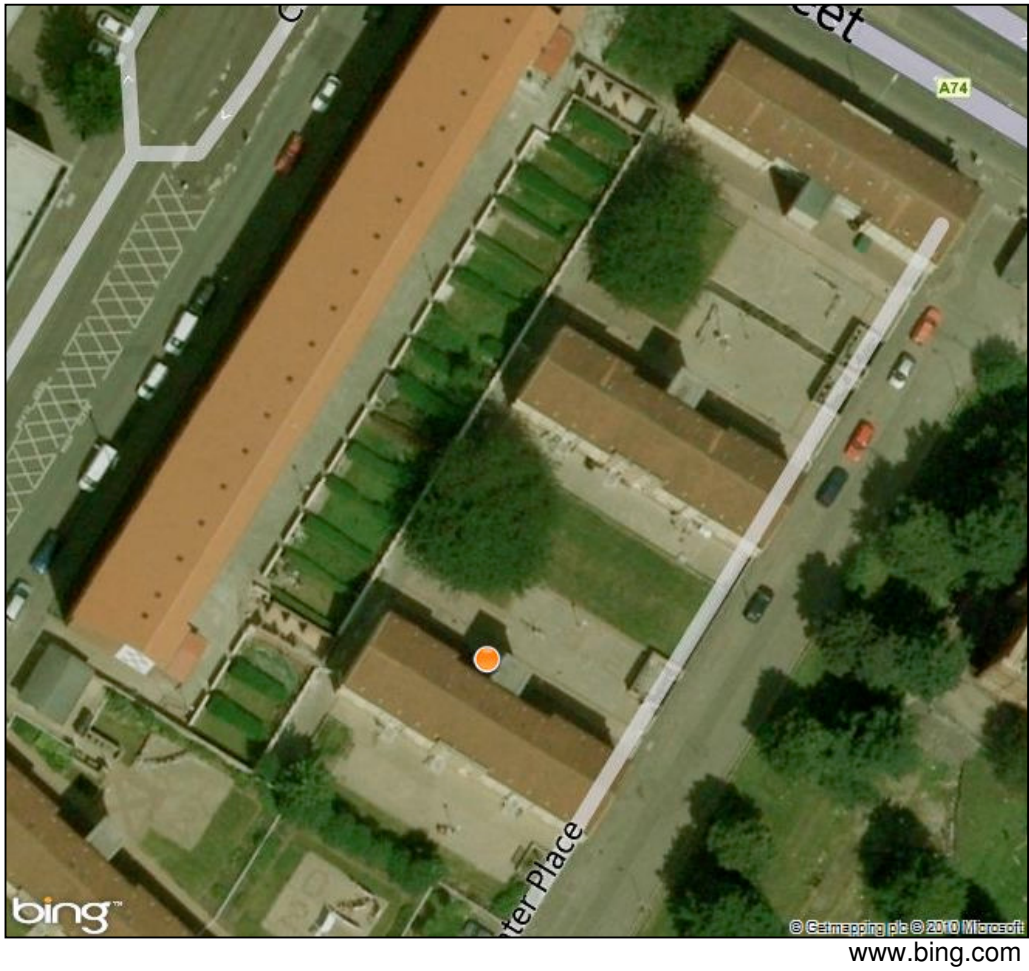
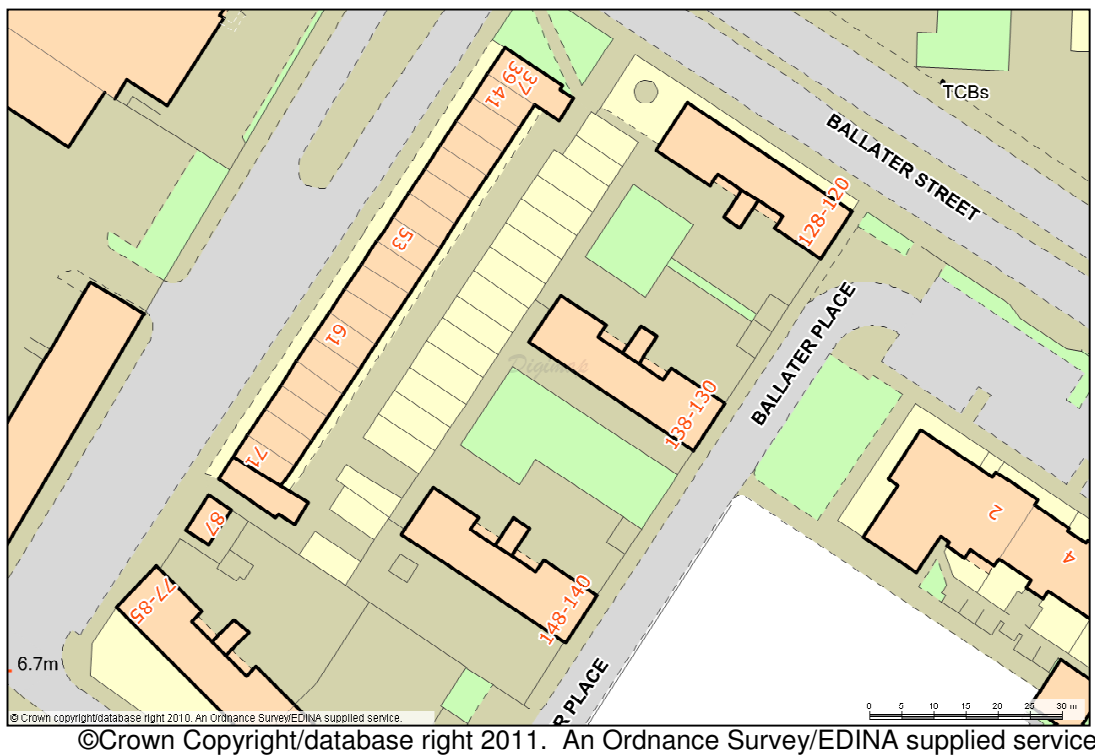


Figure 7.30 Crown Street, Glasgow, Ballater Place – map



Interviewee B Middle aged, long-term sick, single female living in a third floor flat in Moffat Street. (This was the only interviewee who was not in full time paid employment.)

The flats in Moffat Street are set on one side of a courtyard that is not fully enclosed, as half of it is given over to parking. Houses on one side have individual gardens and flats have access to several drying areas, bins are outside the garden walls and the blue bins, in particular, are visually intrusive. The remaining two sides are enclosed by backs of other buildings and a wall. Twenty-eight dwellings share the space and the outside area per dwelling is 240 m². Beyond the parking area is a grassed area with a row of mature trees, a zig-zag hedge and large wooden 'stepping stones' for children to play on.

Figure 7.31 Moffat Street - shared courtyard



Figure 7.32 Moffat Street - shared courtyard



Griffin 15/02/2011 15.49

Figure 7.33 Moffat Street - shared courtyard



Debra took great care to draw an accurate sketch map of this central area. She said that she is at home most of the time and enjoys watching the children playing from her window. She thinks that the space is well designed for children's play and the parents can keep an eye on them from their kitchen windows. She also described a young man who exercises out there sometimes. She only goes into the space to take her rubbish out and spends as little time as possible out there. She would like to hang her washing outside, but does not know which drying green she is allowed to use. She does not feel that she can use any of them. She is very wary of her neighbours and described an incident that had greatly upset her. She had brought in the washing of two neighbours out of the rain. One had been pleased, the other very angry. She was clearly frightened of meeting this man outside. Debra accompanied the researcher around the outside space, but was very nervous and relieved to get back to her flat. The space was not as neat and cared for as Joe's; for example, an old sofa had been left outside one gate and some vegetable clippings had been tipped onto one of the hedges. The grass was less 'shorn', but the shrubs were tidy and the green space was inviting because it was not manicured: there was no feeling that one should not walk on the grass. When Debra wants to get outside she walks to Glasgow Green or takes a bus to Richmond or Kelvingrove Parks.

These two interviews emphasise the same issues with shared residential outdoor spaces. Four other interviews corroborate the same points. All of the interviewees live on upper floors and none of them use the shared ROS. They are all very conscious of the shared space being overlooked, are self-conscious in the space and aware of the possibility of neighbours watching them. They are concerned that they might break some unwritten rules that they don't know

about. They all, however, appreciate having some green space there. All the interviewees go to public parks or for walks through the city when they want to get outside. Joe is the only one who has a balcony to sit outside on.

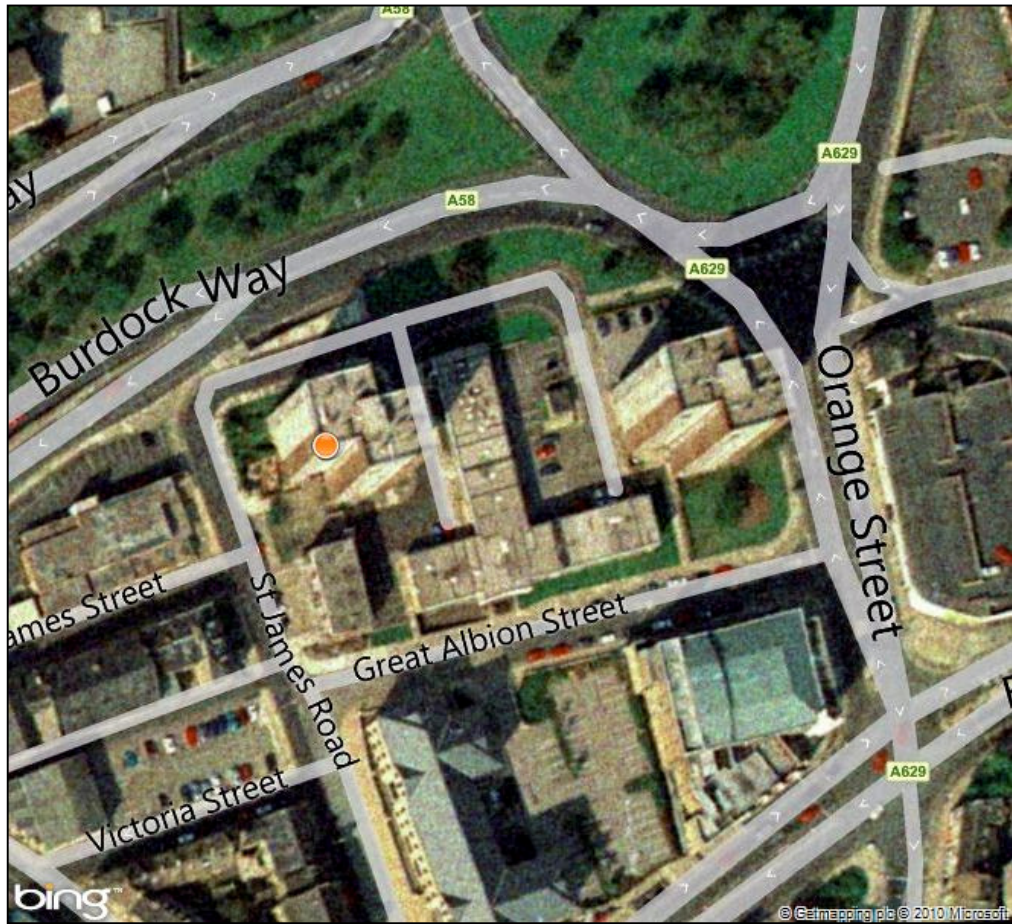
The other interviewees live in traditional tenements in Edinburgh and do not have factoring contracts. The maintenance of their back greens depends on them getting together with other tenants to pay someone to mow the grass and prune the shrubs or a resident on the ground floor taking responsibility for it. Where the latter happens residents from higher floors feel even more strongly that they are invading someone else's space.

7.3.7 St James Court, Halifax

St James Court is one of a pair of 1960s tower blocks built in the centre of Halifax. It has sixty-one dwellings in thirteen storeys (including the basement). All the flats above the ground floor have a balcony and the blocks are surrounded by public grassed space. The questionnaire was returned by nine residents; five single women, two single men and two couples: a response rate of 13%. All the respondents are either retired (6) or on long term sick (2), they are social tenants, aged between 55 and 82 years with no children living in the household. Five of the respondents are regularly visited by children. Three live in the basement, one on each of the ground and first floor and four on the third floor or above. Nine other people returned blank forms.

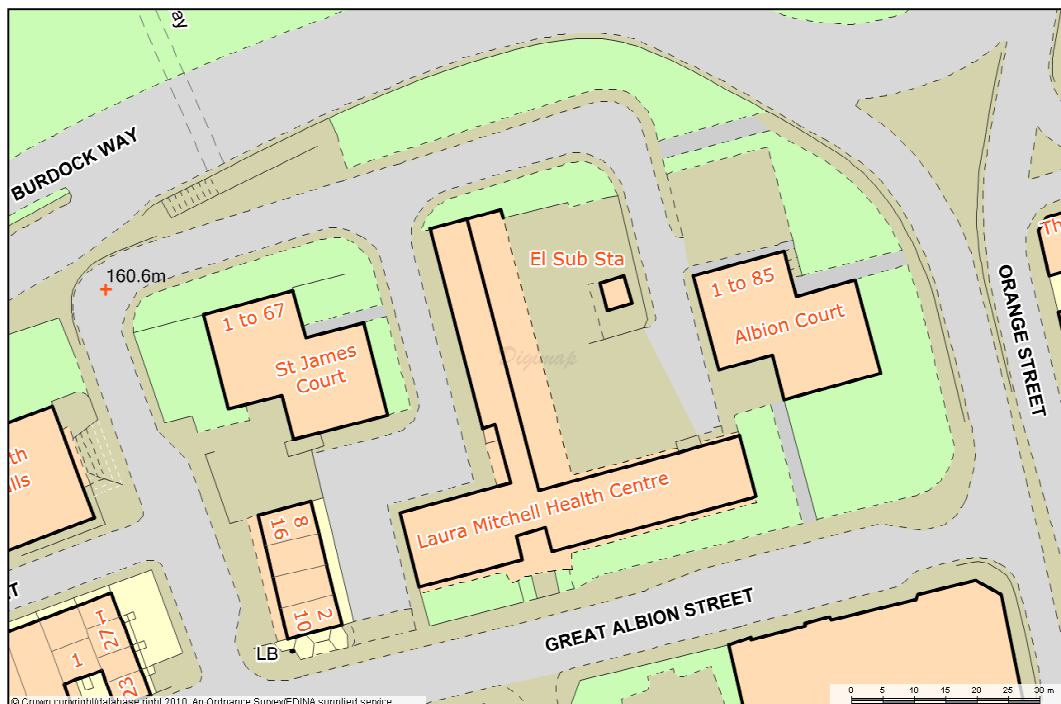
Two thirds of the respondents use their balconies at least once a week for *sitting and relaxing* in the warmer months, four (44%) *hang washing out* and five (56%) *talk to neighbours* in the surrounding green space. *Two feed wildlife* and one *entertains visitors*. No other activities are done more often than rarely.

Figure 7.34 St James Court, Halifax - aerial view



www.bing.com (Feb 2011)

Figure 7.35 St James Court, Halifax - map



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Eight of the respondents answered questions A4 and A5. Three appreciate being able to sit outside. One of these watches the stars through a telescope. Another respondent complains that the balcony is too small to put a chair on and a second wants the balcony to be bigger. Even so two thirds of respondents use their balcony for sitting out on. Two respondents like being able to meet friends and neighbours in the surrounding green area, but want seating and more greenery, one wants it 'secure from vandals'. Two residents (25%) are doing four activities in their ROS at least once a week.

Even where the surrounding green space is public, residents can enjoy meeting their neighbours. They may be more confident that they know what they can and cannot do, in space that is clearly public than where the space is 'confused' (Coleman, 1964, 1984).

7.3.8 Oakenhurst Road, Blackburn

Built in the 1980s, this development consists of three-storey blocks of flats around two hard-surfaced courtyards. Between the courtyards is a double row of terraced houses with individual back gardens and two grassy areas. The outside area per dwelling is 97m². The flats have no balconies. There is a grassy area around the flats and the courtyards are open to the public.

Fourteen responses were received, a response rate of 14%. All, except two owner-occupiers, are social renters. Ten are women and four are men, ten single and two living with another adult and three respondents have children at home. Another seven have regularly visiting children. The age range is 37 to 84 years. Five respondents are in paid employment, four on long term sick, three retired and one looks after the home. All except one lives in a flat.

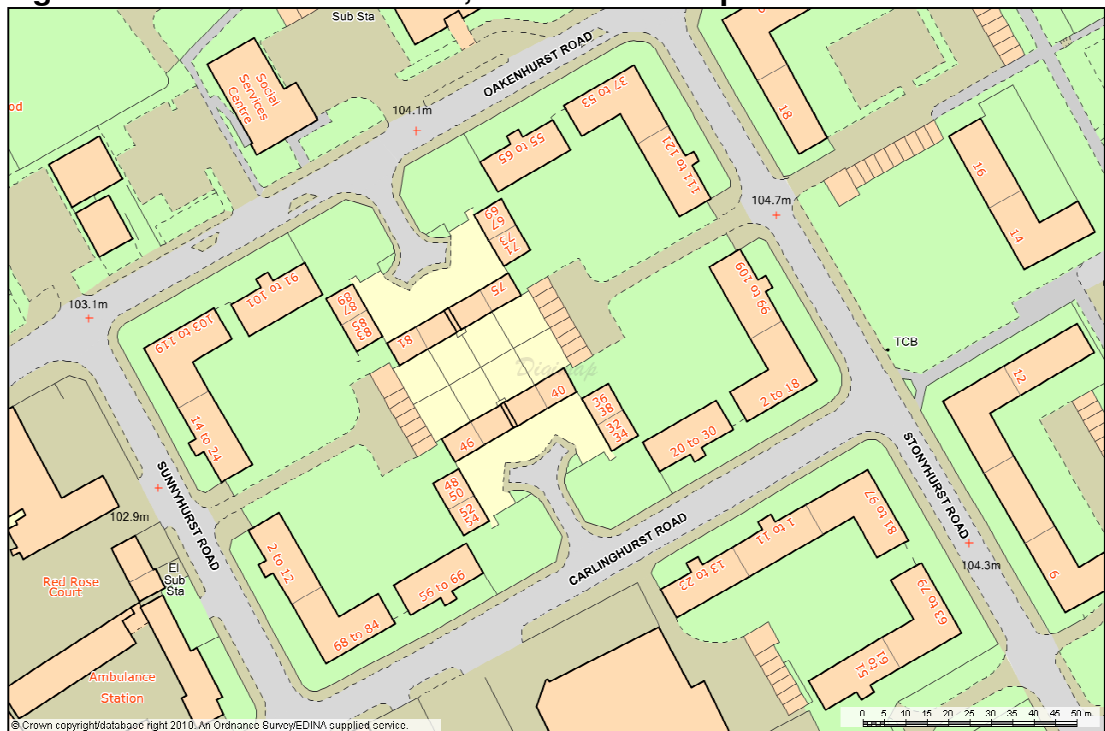
Nine respondents (64%) *hang washing out* at least weekly, six (36%) *talk to neighbours* and three of these *sit and relax*, this often. Three respondents *entertain visitors* in their shared ROS, (this is a higher proportion than in the other developments discussed). Three (21%) respondents do four or more different activities in this space at least once a week. Twelve respondents answered questions A4 and A5. Four mentioned mature trees:

The trees - especially when I have to stay indoors I have something interesting to look at. They are interesting because they attract birds and as I am partially sighted they are big enough for me to appreciate and I can see the seasonal changed colours. (OR23)

Figure 7.36 Oakenhurst Road, Blackburn – aerial view



Figure 7.37 Oakenhurst Road, Blackburn – map



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Respondents appreciate having a green area, but want it better maintained and more private. One respondent is concerned about loitering drug addicts and another about theft from washing lines. Four respondents want a space of their own. Six respondents name lack of privacy as stopping them from going into the space and five add fear of attack and strangers.

These residents have concerns similar to those expressed by residents of Croftley Avenue (Section 7.3.3), although this space is more clearly delineated by the grouping of the blocks. Children live in and visit the flats, but no-one complains about the noise of children playing. This may be because the wider space, mainly grassed, is less noisy than the courtyards at Coopers Road (Section 7.3.1) or because children are not allowed out to play in this semi-public space. Lack of individual balconies reduces what respondents feel able to do, but the feeling of some enclosure does enable some of them to use the shared space. One respondent sits out in the shared space in warm weather.

7.3.9 Old Pye Street, Westminster

Old Pye Street is typical of the late 19th Century estates built by Peabody in central London. Situated just behind Westminster Abbey, it consists of nine six-storey blocks of flats around tarmacadamed courtyards. The outside area per dwelling is very low at 6m². The height and closeness of the blocks means that at most times of day the courtyards receive little sun, especially in winter. The flats have no balconies. There is a large, mature tree in the centre of one courtyard with an iron bench built around it. The top of this can be seen in Figure 7.39 in the upper part of the picture. Plantings of shrubs are dotted around.

The return rate was expected to be low from this estate, so questionnaires were sent to all 159 dwellings. Twenty-one questionnaires were returned, giving a response rate of 13%. They are all social tenants. The ratio of women to men, people living alone to couples, people in paid work to the retired, unemployed and long-term sick is roughly two to one in this sample. Fourteen respondents have lived in Old Pye Street for nine years or more. Nine responses are from the ground floor, three from the first, four from the second and five from the third floor or above. Five respondents live with children and two more have children visiting regularly.

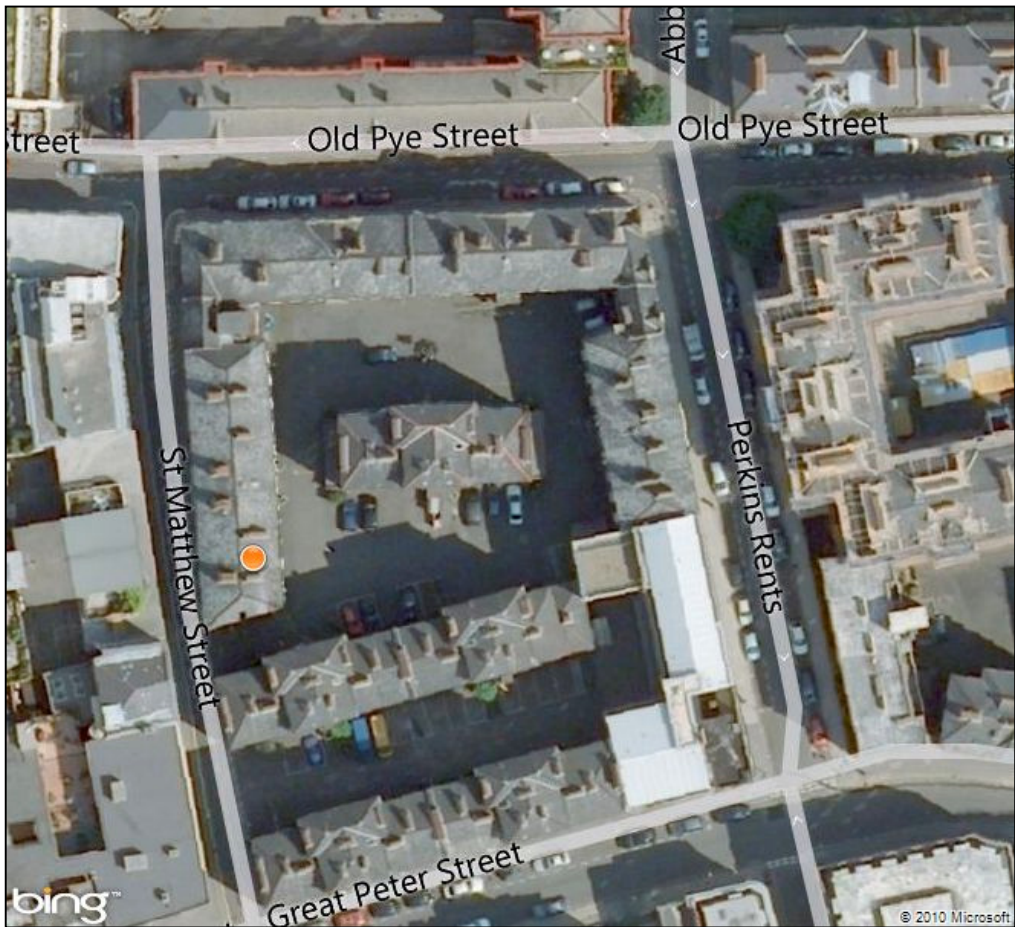
For most respondents, the only activity that they do in their outdoor space is gain access to their dwelling. Seven report *children playing* there and six *talk to neighbours* at least weekly. One respondent *keeps a pet* and another *enjoys wildlife* (birds), but no other activities are listed as being done in the shared ROS at all. Only one respondent (5%) is doing four activities at least weekly in the space. This illustrates how children will play in whatever space is available.

Figure 7.38 Old Pye Street, Westminster



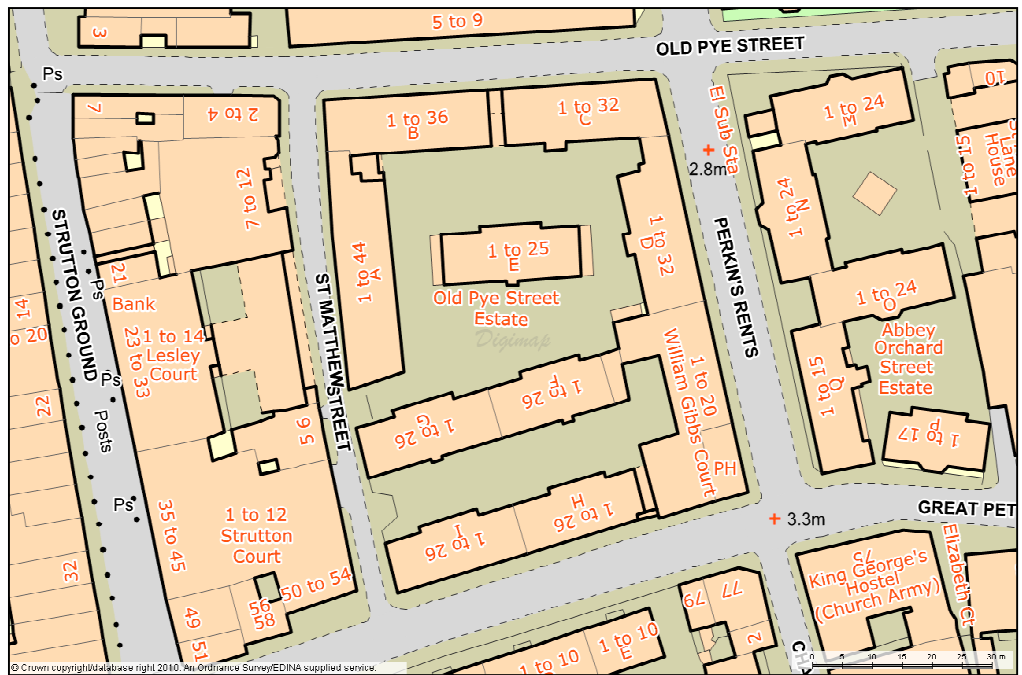
Copyright Peabody Trust

Figure 7.39 Old Pye Street, Westminster – aerial view



www.bing.com (Feb 2011)

Figure 7.40 Old Pye Street, Westminster - map



Seventeen respondents answered questions A4 and A5. Six say that there is nothing that they like about the space. The seating and the opportunity to meet neighbours is appreciated by three respondents. One respondent appreciates safe parking for bicycles and cars, but another comments:

At present it is mainly car parking that is too expensive for tenants to use. It would be fantastic if it could be turned into a communal garden or play area. (PY151)

Sixteen respondents want more greenery with ideas ranging from 'more plants and window boxes' (PY29) through to the garden mentioned above. Four want play facilities for children. Two want secure bicycle storage and two to stop the public walking through. One is concerned by teenagers congregating.

This is an example of outdoor space that has little to offer apart from parking and supports a limited range of activities. Children use the space for play and some respondents enjoy meeting neighbours despite its limitations. This underlines the importance of having outdoor space that does more than separate the buildings.

7.4 Lessons from consideration of these example developments.

In these example developments the shared ROS, of whatever form, seems to be little used by most respondents, though in Coopers Road and Old Pye Street children make use of the space. Examination of these examples suggests what features of shared ROS make it more likely to be used.

7.4.1 Functions of shared ROS

In Chapter 5, Section 5.3.2, it was established that respondents who only have access to shared ROS have similar views to those with some individual ROS about the most important purposes of their ideal residential outdoor space. 75% of respondents in the SROS set rank *sitting and relaxing* as one of the top four most important purposes of their ideal ROS and over 80% of the whole sample use their ROS for this purpose (though not all as frequently as once a week). Over 50% of the SROS set rank *entertaining visitors* and *eating outside* and 48% rank an attractive environment in the four most important purposes. The shared residential outdoor spaces examined here have little success in providing affordances that enable residents to use the space for these activities.

7.4.2 An attractive environment

The importance of an attractive view for psychological health should not be underestimated (Kaplan, R., 2001). This is a key function of shared ROS for residents whose dwellings overlook it. Where it is green, attractive and well maintained, shared ROS is appreciated for giving an attractive outlook (for example Croftleigh Avenue, Section 7.3.3). Several respondents particularly mention the pleasure given by having mature trees in the view. The questionnaire did ask residents a series of questions about the view from

their dwelling, but did not ask if this was a view of their residential outdoor space. 9% of respondents who answered question A4 (what they like about their ROS) say that they like the view from their dwelling (Section 5.3.4.1 Table 5.9), but often this is a wider view (for example over Bath). So the information gained about the views from respondents' dwellings cannot be directly related to their ROS. 91% of respondents who answered question A4 did not comment on the view.

If the shared ROS is attractive and well maintained it is fulfilling an important function for the residents, but may not fulfil its potential usefulness.

7.4.3 Space to sit and relax

Where residents have no individual ROS, the only typology where as many as half the respondents *sit and relax* is the back garden shared by a small number of dwellings as found in Bath (Section 7.3.2). This is also true for *gardening and enjoying wildlife*. In all the other typologies where there is only shared ROS, the levels of these activities are much lower. In Coopers Road (Section 7.3.1) respondents make it clear that they *sit and relax* in their individual ROS and not in their shared ROS. This may also be true for other developments in the ISROS set. The relative success of the shared back gardens in Bath in providing these affordances is probably because of several factors. One is that most of these gardens are well-established with mature trees, which provide some protection from over-looking. Another is that they are shared by a small number of households which makes it easier to negotiate ground rules for their use. This interpretation is supported by the finding that a respondent living in a flat with a concern about privacy and more than 20 households sharing the ROS is very unlikely to use that ROS

(Section 6.3). Being able to relax in their ROS is one of the things that respondents value most about it, which agrees with findings from earlier research (Kaplan, 1973; Bhatti and Church, 2004). This is an important affordance that many of the shared residential outdoor spaces surveyed are failing to provide. The six interviewees, who are all mobile, prefer to visit nearby public open spaces for relaxation.

The higher rates of sitting and relaxing in shared back gardens than in other typologies, suggests that where a large area is created inside a perimeter block it may be better used if it is divided into smaller sections shared by fewer (<20) households. This model is similar to that of traditional Scottish tenements, where each staircase of between four and sixteen flats has its own backgreen (Robertson, 2004).

7.4.4 Space to meet and talk to neighbours

The proportion of respondents *talking to neighbours* at least once a week is higher in developments where residents have some individual space, for example, Coopers Road (56%) (Section 7.3.1), St James Court (56%) (Section 7.3.7) and Croftleigh Avenue (50%) (Section 7.3.3). These three very different developments in both design and demographic have a higher proportion of residents talking to neighbours at least once a week than the average in the ISROS set (40%) (Section 5.2.1.2 Table 5.2). The reason for this may be that they are all in the social rented sector, but they contrast with the social housing in Moffat Street in the Crown Street development (Section 7.3.6) where the proportion of respondents *talking to neighbours* at least once a week is 25%. The key difference is that in the first three developments residents have their own individual ROS and have to walk

through the shared ROS to gain access to their front doors. This means that they are more likely to see each other and begin to develop social relations than in Moffat Street where entrances to the staircases open onto the street.

Other activities take respondents into their shared ROS. For example, in the SROS set some respondents from Oakenhurst Road (64%) (Section 7.3.8) and Thornes Park (46%) (Section 7.3.5) hang washing out in their shared ROS, even though it is semi-public, because they have no individual space to do this in. Access to front doors is also through this space. These two features may explain why the proportion of respondents in these developments who talk to neighbours are 36% and 46% respectively, higher than the SROS average of 30%.

7.4.5 Encouraging use of shared residential outdoor space

One of the key issues that discourage respondents from using their shared residential outdoor space is lack of privacy. Respondents clearly prefer not to be overlooked (Section 5.3.4), but if Joe's statement that people in ground floor dwellings do use their gardens despite being overlooked is accurate, the issue is partly about ownership and control of space. In their own ROS residents make the rules and are quite clear about what is allowed. This makes it easier to ignore the fact that the space is overlooked. In shared space residents are uncertain what the 'rules' are and therefore more self-conscious. They are concerned that they may upset or intrude on their neighbours or that neighbours might be critical of them or aggressive towards them. This uncomfortable feeling in their shared ROS was confirmed by the other interviewees who all live on the third or fourth floors of their buildings. All these feelings are worsened by not knowing or recognising the

neighbours. There is a 'Catch 22' here. Not being familiar with the neighbours discourages use of the space and not using the space prevents one from seeing, let alone meeting, the neighbours. This effect is particularly strong where ground floor windows look directly onto the shared ROS or where a high number of dwellings share the space so that there is little chance of recognising all the residents who may enter it. This is true even where the ROS is fully enclosed as in Crown Street (Section 7.3.6).

Uncertainty is increased in developments where it is not clear if the space is private or public (for example Croftleigh Avenue and Thornes Park). In this 'confused' space use of the shared space is limited by uncertainty about what is permissible and insecurity about who one might meet. Where 'confused' spaces have to be used for access the activity of *talking to neighbours* is facilitated and is often the main activity done in the shared ROS.

Solutions to low usage suggested by consideration of these examples are based on ensuring that residents have reasons for going into the shared residential outdoor space. This can be achieved in many ways:

- Laying out the development so that residents have to walk through the shared ROS to access their dwellings or parking spaces, as discussed above, enables neighbours to get to know each other by sight.
- The provision of some individual outdoor space achieves the same thing in a different way. For example at Coopers Road (Section 7.3.1) the balconies are appreciated and used for many different activities. They are not sheltered from being overlooked, but provide space that belongs to the resident. The residents can decide for themselves what they do there. They are therefore less concerned about the

reactions of their neighbours. Residents who get out onto their balconies can see their neighbours and be seen by them. This helps to breed familiarity and may lead to conversations. This helps to reduce uncertainty about the shared ROS.

7.4.6 Guidelines for improving the usefulness of shared residential outdoor space

This research suggests that the key functions of shared, residential outdoor spaces are:

1. To provide space between buildings
2. To provide an attractive outlook
3. To provide a space for relaxation and 'getting away from it all'
4. To provide opportunities for social interaction with neighbours
5. To provide safe space for children to play

An attractive outlook involves green areas, especially trees and where possible, mature trees should be incorporated into the design. Fully-grown trees also help to reduce the feeling of being over-looked. The space needs to be well maintained, but a manicured look should be avoided as this inhibits use. Opportunities for social interaction are best provided by residents having to use the shared space for access and can be enhanced by the provision of seating at strategic points and the provision of facilities for the drying of washing. Children will play in the space provided, however suitable it is for this use. The thought needs to be given to how to ensure that adults retain some ownership of the space.

The findings in Chapters 5,6 and 7 all emphasise the importance to respondents of having some individual outdoor space. It needs to be big enough to allow residents to sit outside and must be able to receive sunshine at some point during the day. Ideally it is big enough to allow space for a table, four chairs and some plant pots. Not only does this increase the opportunities for residents to do more different activities in their residential outdoor space, it also enables them to become more familiar with their neighbours and increases the possibility that they may start to use their shared space. The smaller the area per dwelling and the more dwellings sharing the ROS, the more important the provision of some individual residential outdoor space becomes.

CHAPTER 8 FINDINGS, CONCLUSIONS AND FUTURE WORK

8.1 Overview

The starting point for this thesis is that outdoor space in urban areas is an important resource that should be used effectively. This assertion is supported by an exploration of some of the large body of research that demonstrates the environmental, physical, psychological, emotional and social benefits that residents of urban areas gain from their local outdoor spaces. Some of these are passive benefits, in the sense that people who never enter, or even look at, the outdoor space, still receive the benefit. These passive benefits include improved air quality (Bernatsky, 1978; Bradshaw, 1995), reduction of water run-off (Whitford *et al.*, 2001) and mitigation of extreme temperatures (Grey and Deneke, 1978; Georgi and Demetre, 2010) and are particularly powerful when the outdoor spaces are green and include the presence of trees or large shrubs (Whitford *et al.*, 2001). More direct benefits are felt by those who view or enter the outdoor spaces. These range from the relaxing and calming effects of looking at a green space (Hartig and Staats, 2006; Kaplan, R., 2001; Ulrich, 1984) to the health benefits of taking exercise in an outdoor space (Hakim *et al.* 1998; Kacynski and Henderson, 2007; Paffenbarger, *et al.*, 1986) and the opportunities to observe and meet other people (Matsuoka and Kaplan, R., 2008; Sullivan *et al.* 1996)

In contrast to the large number of studies of how people use individual public parks (Cooper Marcus and Francis, 1998; Matsuoka and Kaplan, R. 2008; Project for Public Spaces, 2000) there has been little research on how people with small amounts of residential outdoor space use that space. Post-occupancy evaluations of both public and private outdoor space in housing developments show that lack of thought about how residents will use their

ROS can result in housing developments that do not work well (Cooper Marcus, 1975; Cooper Marcus and Sarkissian, 1986). Lack of provision of play space for children causes particular problems, as they play in whatever space they can find; where they may be considered a nuisance by some residents. Research into the meaning of their gardens to residents suggests that they are chiefly seen as a place to retreat to and sit and relax. Ownership, control and self-expression are important to residents, many of whom see the garden as an extension of the house (Bhatti and Church, 2004).

How shared residential outdoor space is used has usually been a peripheral consideration in studies relating housing design and layout to health, well-being or social capital. Designers and planners hope to create a vibrant social space, but largely fail (Lawrence 1981). Shared space appears to work better if residents also have some individual ROS where they are in control of how much they engage with their neighbours (Cooper Marcus and Sarkissian, 1986; Pettigrew *et al.*, 2009). The study of community gardens identifies a range of benefits to those involved and these principles have been employed with some success to residential shared spaces (Frith and Harrison, 2004; Robertson, G., 2004).

This research brings these themes together by investigating how residents of different housing developments use shared residential outdoor space and the factors that support their activities.

Consideration of the literature and the aims of this research led to the development of a large number of variables that may affect how often residents enter their outdoor space and what they do there (Chapter 3).

These come into four categories: the attributes of the space itself; personal and household attributes; attributes of the dwelling and development and attributes of the local area. Association with the I'DGO project enabled the researcher to investigate a large number of different developments, which gave variability in most of the variables of interest and to compare usage of shared residential outdoor space with that of individual residential outdoor space such as private gardens. The chosen methodology was to gather data from residents of developments with shared ROS and houses and flats with individual ROS in nearby streets using a postal questionnaire. Data about the developments and local area were gathered in a desk-top map-based study. These methods were triangulated against data from interviews and site visits.

8.2 Findings

The sample was divided into three sets to enable comparison between the three groups: respondents with access to individual ROS only (IROS); respondents with access to shared ROS only (SROS) and respondents with access to both (ISROS). A fourth group of 25 respondents emerged who had no access to residential outdoor space (NROS), sometimes because, as tenants, they had not been given the required key.

8.2.1 Differences in usage

Analysis of the data confirms that *sitting and relaxing* is a key activity in residential outdoor space. This agrees with the findings of Bhatti and Church (2004) in their study of private gardens. 78% of respondents in the IROS set do this in their outdoor space at least once a week in the warmer months, while only 27% in the SROS set (and 67% in the ISROS set) *sit and relax* this often in their ROS. The other most frequent activity is *hanging washing out*,

which is done at least once a week by 32% of respondents in the SROS set, compared to 50% in the ISROS set and 78% in the IROS set. The results show conclusively that the levels of all activities (except *access*) of respondents in the SROS set are considerably lower than in the ISROS and IROS sets (Section 5.2.1.2, Table 5.2). Only 24% of the SROS set agree with the statement 'I am able to do everything I would like to do in this space' compared to 38% of the ISROS set and 55% of the IROS set (Section 5.3.1). The proportion of respondents who do no activity in their residential outdoor space at least once a week in the warmer months are 5% in the IROS set, 6% in the ISROS set and 21% in the SROS set (Section 5.2.1.2, Graphs 5.12 to 5.14). Investigation of respondents' preferences, satisfaction and written comments show that there are no significant differences between the aspirations of respondents from the three sets (Section 5.3).

8.2.2 Factors influencing how much respondents use their ROS

Frequencies in the three sets were checked to eliminate any variables that varied little between the three sets (for example gender). Cross-tabulations were then generated to identify which of the remaining variables are associated with variations in usage. Instead of using a statistical, variable-based analysis, a case-based, probability approach was used. Each returned questionnaire represents a case and these were gathered into sets of cases which share the same attributes, using fsQCA software (Ragin, accessed Sept. 2008). A figure was generated for each set that represents the probability that residents in that set use their ROS at least once a week for four different activities in the warmer months. Sets were generated for small groups of attributes at a time (Table 4.7). The combinations of

attributes were varied and the analysis repeated, enabling key combinations of variables associated with variations in usage to be identified.

The attributes of shared ROS itself that are associated with higher rates of usage are: area available per dwelling (including parking spaces, drives and footpaths) greater than 160 m²; number of dwellings sharing the space lower than twenty and the area being at least 20% green (Section 6.3). Other factors associated with lower usage of shared space are residents living above the first floor and concerns about noise or lack of privacy. The groups of residents who make the most use of their residential outdoor space are those of any age who are looking after the home or family, especially those with children, and mature and older adults (54-77 yrs) who are retired (Section 6.2.4.7). Those who are unemployed are the least likely to use their ROS. Demographic variables do not explain the variations in usage across the sample. Levels of activity are highest in the IROS and lowest in the SROS set and the ISROS set comes in between the two. The average values of most of the demographic variables either show small differences between the sets or a trend that acts against the fall in usage between the ISROS and SROS sets. For example younger people are likely to use their ROS less (Sections 6.2.4.1 and 6.2.4.7) and average age in the SROS set is 1.5 years lower than in the IROS set, but 4.1 years higher than in the ISROS set. Similarly, length of residence is lower in the SROS set than in the ISROS set. The only demographic variables measured in this research that may be linked to lower usage in the SROS than in the ISROS set are employment status and the proportion of households with children. The SROS set has a higher proportion of the low usage groups; the unemployed, long-term sick and students than the ISROS set, though this is balanced to

some extent by a higher proportion of retired respondents (Section 6.2.4.5). The SROS set also has a lower proportion of households with children than the ISROS set, which has nearly twice as many households with children as any of the other sets (Section 6.2.4.6). This factor does not explain, however, why usage is lower in the ISROS than in the IROS set. For all demographic groups, including those with children, usage is much lower where respondents have no individual outdoor space, so differences between the sets are not explained by differences in their demographics alone. Personal factors explain the activity levels of individuals and may be the most significant factor in individual developments (for example the numbers of children at Coopers Road, Section 7.3.1), but cannot be used to fully explain the overall different levels of activity between the different sets. The attributes of the space itself and the development are also significant. Attributes of the local area, including the presence of nearby public space showed little influence on usage.

The importance of residential outdoor space as a place to *sit and relax* is emphasised in both the questionnaire responses and the interviews. Privacy and not being overlooked are key concerns of respondents from all the sets and have a strong impact on their ability to relax in their ROS. 19% of respondents who answered the question 'What do you like most about your outdoor space?' (A4) mentioned privacy and not being overlooked. Seclusion and peace were also appreciated. Lack of privacy and being overlooked was mentioned as something that they would like to change (A5) by 9% of respondents who responded to this question.

In a mixed development of houses with individual gardens and flats with only shared ROS (Southside Crescent, Crown Street, Section 7.3.6) an interviewee on the fourth floor reported that residents with individual gardens are often out in them, but he rarely saw adults in the shared space. These individual gardens are just as overlooked as the shared space. This suggests that residents feel more inhibited by being overlooked when using the shared space, where they are not sure what the 'rules' are, than they are in their own gardens, where they make their own 'rules'. This is supported by the rest of the interview data, which confirms that some residents, particularly those on higher floors, do not feel that the shared space is theirs and feel uncomfortable in it. This is particularly exacerbated in situations where the ground floor properties look directly onto the shared space without an intervening private individual outdoor space. Where ground floor households have taken responsibility for looking after the area of shared ROS close to their dwelling, other residents feel that they have no right to use that area.

A small number of respondents from a few developments mentioned the liveliness and social benefits of their shared space. More often expressed was concern about neighbours' poor behaviour, most frequently noisiness, but also dogs or children causing a nuisance. A few responses came from a development suffering serious aggression from one family.

Consideration of the example developments in Chapter 7 suggests that the key to increasing usage of shared ROS is giving respondents a reason to be there and opportunities to become familiar with their neighbours.

8.3 Limitations of the research

The problems of inaccuracy in answering questions, discussed in chapter 3, do not cause major errors in this research, because the questions asked in the questionnaire are not particularly sensitive or personal and great precision is not required. The research is relying on residents estimating the frequency of their own behaviour. The frequency bands were defined broadly, for example as “at least once a week” rather than “weekly”, making it easier for respondents to decide if their frequency fitted this category or not. As the point to differentiate levels of usage was chosen as the difference between “at least once a week” and “at least once a month”, the main source of error is in the possibility of the wrong choice being made between these two categories. This is most likely to happen where the frequency is nearly once a week and inclusion of some of these cases in the category “at least once a week” may have raised the estimates of usage made. The effect of one respondent making this choice is greater in the smaller SROS set than in the IROS set, so there may be some relative overestimation of usage in this set. This error would tend to reduce slightly the difference between usage in the SROS and the IROS set. It works against the differences found and therefore has no influence on the overall conclusions.

The low response rate to the postal questionnaire (17%) means that the respondents do not represent a majority of residents. (The sample is more representative in the eight developments where response rates were higher (31% to 54%) (Section 6.2.1)). For this reason demographic data gathered is only representative of the sample and does not represent the population of each development, though it does suggest some differences between the residents of different developments as discussed in Chapter 7.

It is assumed that respondents from different developments have similar motives for responding and that this sample (n=1328), though not representative of the population in general, is representative of those residents with an interest in residential outdoor space and sufficient literacy to complete the questionnaire. This means that though the data cannot be used to generalise about the ways in which the population of Great Britain as a whole uses their residential outdoor space, it can be used to compare the usefulness of different residential outdoor spaces.

The sample contains a wide range of different types of development with different amounts and types of residential outdoor space. It is, however, heavily weighted towards post-2000 (urban renaissance) developments because the impact of these developments on the well-being of older people was a particular interest of the I'DGO TOO project. These newer developments are most likely to have single people, couples and families with small children living in them and this is confirmed by responses about household membership. The impact of older children and teenagers on shared, residential outdoor space, is not yet being experienced in these new developments. The conclusions about shared spaces in general are therefore skewed towards more modern developments with few older children. The impact of this on the study has been balanced by examining individual developments of various ages in more detail.

The number of interviews obtained is smaller than intended and they were all from young or established adults in paid employment (except one long term sick). The lack of interviews from residents of ground floor flats in particular is a major gap in the study.

8.4 Conclusions

This research has demonstrated that residents who only have access to shared residential outdoor space make far less use of that space than those who have some individual space. There is no evidence that amongst this sample of respondents, those with access to shared ROS only have different aspirations to others about what they would like to do in their ROS. The groups that are most active in their ROS are those who spend most time at home: those looking after the home, those with children and the retired (but not the unemployed and long-term sick).

The most important purposes of shared residential outdoor space are:

- To provide space between residential buildings
- To provide an attractive outlook
- To provide a space for sitting and relaxing
- To provide a space for talking to neighbours
- To provide a space for children to play in

Examination of specific developments confirms the importance of the ROS being attractive and well maintained with some green space and mature trees, but suggests that one of the keys to ensuring that the space is well used is making sure that residents feel comfortable in the ROS. Excessive noise is a barrier, but where this is not perceived as a problem uncertainty and fear of upsetting neighbours are the most common barriers to using the space, especially for those living on upper floors. To feel more comfortable residents need to be more familiar with their neighbours.

This can be supported by considering how the space will be used during the design phase and including some or all of the following features:

- No more than twenty dwellings share any one, shared ROS.
- All residents gain access to their dwellings through the shared ROS.
- Shared ROS contains features that residents need to access, such as routes to parking, bin storage and drying areas.
- Shared ROS contains carefully sited features that encourage residents to linger in it, for example; seating, a water feature, space for a barbeque, natural area to attract wildlife.
- Shared ROS has areas available for people to garden, preferably close to their dwelling, so that the 38% and 39% of respondents in the SROS and ISROS sets who rate gardening in the top four most important purposes of their ideal space have opportunities to do some.
- Residents have some individual ROS, however small, which overlooks the shared ROS. This research shows that they are then more likely to go outdoors and this increases their opportunities to become familiar with their neighbours and the shared ROS.
- Areas that are attractive to children and others with little to attract children are differentiated, so that adults and children can use the ROS.

Residents are more likely to use shared ROS if they are quite clear what they are 'allowed' to do there. This is supported by:

- Clear divisions between spaces with different functions.
- Clear transitions between individual spaces and shared spaces.
- Individual space under ground floor windows, with planting to improve privacy in ground floor dwellings and enabling those from higher floors to feel less like intruders.
- Clear arrangements about management and maintenance.

The wish to have some outdoor space of "my own" is strongly held by some residents who only have access to shared ROS and residents of city centres are particularly appreciative if they have any individual outdoor space at all. To be useful balconies and patios should receive sunshine at some point in the day and be large enough to contain a table and two chairs comfortably.

As Cooper Marcus (1975) concluded designers of residential outdoor space who are aware of the activities that residents wish to do in their outdoor space are likely to produce the most successful spaces.

8.5 Contribution to knowledge

As far as this researcher knows, a large-scale comparison between how residents use shared residential outdoor space and how residents use individual residential outdoor space has not been done before. The use of Digimap and birds-eye view enabled data that would normally be collected during a site visit to be collected for a much larger number of sites than would

be possible in visits. This enabled a semi-case study approach to be taken, with the documentation of the physical attributes of over 300 areas.

The methodology for collection of data from a large sample is not unusual, but the approach to its analysis is. In this study the sample was treated as a collection of cases with different attributes. This approach avoided making the assumptions that variables are independent (when they are clearly not) or that variables had a clearly defined mathematical relationship to each other. It also avoided loss of information from minority cases in the sample during the analysis.

The finding that residents who only have access to shared residential outdoor space use it less than those who have access to individual residential outdoor space, though not surprising, has not been so clearly demonstrated before. Nor have the possible reasons for such differences been examined in such detail. The importance of attractiveness, good maintenance and greenness has been established in studies of public parks and community gardens. Stage of life is considered in health and well-being studies. Some studies of use of outdoor space focus on a particular stage of life, for example children, teenagers or older people, but very few consider the whole life span. This study has brought all these considerations together and added other factors such as area per household and uncertainty about what is permissible which have not been considered in previous studies of residential outdoor space.

8.6 Areas for further research

There is still much to be learned from this database, which could be used to answer such research questions as:

- How strong is the association between usage of residential outdoor space and well-being?
- How important is a green view to residents?
- Is there a relationship between the number of trees to be seen from the dwelling and satisfaction with the view or with the dwelling?

All the interviewees reported feeling inhibited about using the outdoor space and feeling that the shared residential outdoor space is not theirs. They also felt uncertain about what they are “allowed” to do in it and concern about avoiding conflict with neighbours. This was not an issue that was apparent from questionnaire responses and needs to be more fully explored. Is this a common feeling amongst residents and what needs to happen to overcome it? No interviews were obtained from residents living on the ground floor, so their views on using the shared spaces and what they could do in them are unavailable. A study of the experience of ground floor residents would help to fill this important gap in this research.

Several of the developments initially selected did not return any responses. Some of these have particularly unusual layouts and would be worth approaching again.

A small number of responses were received from developments that have roof gardens (Fulham Island, London and Plaza West, Sheffield). These suggest that roof gardens are appreciated, but are used less often than residents would

like because of difficulties of access. A further study of the pros and cons of roof gardens from the residents' point of view would be useful in assessing them as a solution to the lack of available outdoor space in city centres.

It would be of great interest to repeat the study in some of the newer developments, in about ten years time, to discover the impacts of an ageing infra-structure, changes of residents and households and increases in the number of older children on the use made of the shared spaces.

There are clearly aspects of the way in which shared outdoor spaces are managed that have great influence on the ways that they are used.

Residents are more likely to use spaces that are well maintained (especially if they pay a separate fee for that maintenance) and attractive. They are also more likely to use spaces where the uses of that space are either made clear by the design or are made clear in leases and contracts. Further research is needed to clarify how management of such spaces is linked to levels of usage.

8.7 Closing remarks

Shared residential outdoor space is an important resource that this research has confirmed is not used effectively. This thesis has identified key factors that influence to what extent residents feel able to use their shared, residential outdoor space. Some of these factors can be improved by the allocation of sufficient outdoor space to the development and by good design. Designers who consider how people will use the space above ease of maintenance and aesthetics are more likely to produce successful, usable spaces that bring residents maximum benefit. This thesis identifies some

considerations that can support designers in achieving this. The biggest contribution that designers can make to increasing residents' usage of their residential outdoor space, however, is to provide each dwelling with some individual outdoor space, such as a patio or balcony, that receives some sunshine during the day and is large enough to contain a table and two chairs.

Appendix A3.1 List of Lower Super Output Areas in the sample

Town or City	Lower Super Output Area (LSOA)	Urban (less sparse)?
Basingstoke	Basingstoke and Deane 009A	Yes
Backworth	Blyth Valley 011B Blyth Valley 011C	Town and fringe (less sparse)
Bath	Bath and North East Somerset 007C Bath and North East Somerset 007D Bath and North East Somerset 007E Bath and North East Somerset 007F	Yes
Birmingham	Birmingham 029B Birmingham 068C Birmingham 093A Birmingham 093C Birmingham 093D	Yes
Blackburn	Blackburn with Darwen 006E Blackburn with Darwen 008E	Yes
Bolton	Bolton 004B	Yes
Brighouse	Calderdale 015A Calderdale 023C	Yes
Bristol	Bristol 005A Bristol 023E Bristol 032D	Yes
Broadway	Wychavon 018A Wychavon 018C	Village, Hamlet and Isolated Dwellings (less sparse) Town and fringe (less sparse)
Cambridge	Cambridge 003B Cambridge 012C	Yes
Cardiff	Cardiff 011C Cardiff 011D Cardiff 020C Cardiff 044A Cardiff 047A Cardiff 047B Cardiff 047C	Yes
Caterham-on-the-Hill	Tandridge 003D	Yes
Chelmsford	Chelmsford 005C	Yes
Chorley	Chorley 008A	Yes
Clacton	Tendring 018A	Town and fringe (less sparse)
Coulsdon	Croyden 041A Croyden 044B	Yes
Coventry	Coventry 006A Coventry 010B Coventry 011C Coventry 014C Coventry 020A	Yes
Dundee	Data Zone	Yes
Durham	Durham 008B	Yes
Edinburgh	Data Zone	Yes

Town or City	Lower Super Output Area (LSOA)	Urban (less sparse)?
Falmouth	Carrick 011A Carrick 011D	Yes
Farndon	Newark and Sherwood 012C	Town and fringe (less sparse)
Fernhurst	Chichester 001C	Town and fringe (less sparse)
Frome	Mendip 004C	Yes
Gateshead	Gateshead 007C	Yes
Glasgow	Data Zone	Yes
Halifax	Calderdale 008E Calderdale 014D	Yes
Haslemere	Chichester 001B Chichester 001C	Village, Hamlet and Isolated Dwellings (less sparse) Town and fringe (less sparse)
Huddersfield	Kirklees 049B	Yes
Ilford	Redbridge 023D	Yes
Ilkley	Bradford 005A	Town and fringe (less sparse)
Kingston-upon-Thames	Kingston upon Thames 009C	Yes
Leicester	Blaby 005A Blaby 005B Leicester 023C	Yes
LLandudno	Conwy 002D	Yes
London	Camden 007A Greenwich 009B Greenwich 005D Hackney 004C Hackney 027C Hammersmith and Fulham 017A Hammersmith and Fulham 017E Haringey 020A Haringey 024A Islington 022A Lambeth 002E Southwark 002E Southwark 013C Tower Hamlets 002A Tower hamlets 013C Tower Hamlets 024B Tower Hamlets 005B Wandsworth 010D Wandsworth 010E Westminster 020B	Yes
Maidenhead	Windsor and Maidenhead 005F	Yes
Manchester	Manchester 016B	Yes
Mansfield	Bolsover 007B	Town and fringe (less sparse)
Milton Keynes	Milton Keynes 027D Milton Keynes 027E	Yes
Newark	Newark and Sherwood 004A Newark and Sherwood 012A	Town and fringe (less sparse)

Town or City	Lower Super Output Area (LSOA)	Urban (less sparse)?
Oxford	Oxford 006B Oxford 013C	Yes
Plymouth	Plymouth 026C	Yes
Portishead	North Somerset 001A	Yes
Purley	Croyden 040B	Yes
Reading	Reading 004B Wokingham 009A	Yes
Ryton	Gateshead 001B	Yes
Sheffield	Sheffield 039B Sheffield 043C	Yes
Shepton Mallet	Mendip 009B	Village, Hamlet and Isolated Dwellings (less sparse)
Southampton	Southampton 019B Southampton 022A Southampton 029B Southampton 019C	Yes
Stroud	Stroud 006E	Yes
Teignmouth	Teignbridge 011D	Town and fringe (less sparse)
Todmorden	Calderdale 013C	Yes
Torquay	Torbay 003C Torbay 004B Torbay 007B	Yes
Uxbridge	Hillingdon 025C	Yes
Warrington	Warrington 009B	Yes
West Bromwich	Sandwell 020A	Yes
West Malling	Tonbridge and Malling 007B	Town and fringe (less sparse)
Wetherby	Leeds 002C	Yes
Whitstable	Canterbury 008B Canterbury 008D	Yes
Worcester Park	Sutton 006C Sutton 006D	Yes

Appendix A4.1 Websites consulted for identification of possible study sites

CABE (Commission for Architecture and the Built Environment)	www.cabe.org.uk
Birmingham City Council	www.birmingham.gov.uk
Blackburn with Darwen Borough Council	www.blackburn.gov.uk
Bolton Council	www.bolton.gov.uk
Calderdale Council	www.calderdale.gov.uk
Edinburgh Community Back Greens Assoc.	www.ecba.org.uk
Elderly Accommodation Counsel (EAC)	www.housingcare.org
Gateshead Council	www.gateshead.gov.uk
Kirklees Council	www.kirklees.gov.uk
London Borough of Barking and Dagenham	www.lbbd.gov.uk
London Borough of Barnet	www.barnet.gov.uk
London Borough of Bexley	www.bexley.gov.uk
London Borough of Brent	www.brent.gov.uk
London Borough of Bromley	www.bromley.gov.uk
London Borough of Camden	www.camden.gov.uk
London Borough of Croydon	www.croydon.gov.uk
London Borough of Ealing	www.ealing.gov.uk
London Borough of Enfield	www.enfield.gov.uk
London Borough of Greenwich	www.greenwich.gov.uk
London Borough of Hackney	www.hackney.gov.uk
London Borough of Hammersmith & Fulham	www.lbhf.gov.uk
London Borough of Haringey	www.haringey.gov.uk
London Borough of Harrow	www.harrow.gov.uk
London Borough of Havering	www.havering.gov.uk
London Borough of Islington	www.islington.gov.uk
Royal Borough of Kensington and Chelsea	www.rbkc.gov.uk
Royal Borough of Kingston upon Thames	www.kingston.gov.uk
London Borough of Lambeth	www.lambeth.gov.uk
London Borough of Lewisham	www.lewisham.gov.uk
London Borough of Newham	www.newham.gov.uk
London Borough of Southwark	www.southwark.gov.uk
London Borough of Sutton	www.sutton.gov.uk
London Borough of Tower Hamlets	www.towerhamlets.gov.uk
London Borough of Wandsworth	www.wandsworth.gov.uk
City of Westminster Council	www.westminster.gov.uk
London Open Squares	www.opensquares.org
Manchester City Council	www.manchester.gov.uk
Newcastle City Council	www.newcastle.gov.uk
Oxford City Council	www.oxford.gov.uk
Peabody Trust	www.peabody.org.uk
Places for People	www.placesforpeople.co.uk
Reading Borough Council	www.reading.gov.uk
Sheffield Council	www.sheffield.gov.uk
Urban Splash	www.urbansplash.co.uk
Warrington Borough Council	www.warrington.gov.uk

Appendix A4.1 Websites consulted for identification of possible study sites

CABE (Commission for Architecture and the Built Environment)	www.cabe.org.uk
Birmingham City Council	www.birmingham.gov.uk
Blackburn with Darwen Borough Council	www.blackburn.gov.uk
Bolton Council	www.bolton.gov.uk
Calderdale Council	www.calderdale.gov.uk
Edinburgh Community Back Greens Assoc.	www.ecba.org.uk
Elderly Accommodation Counsel (EAC)	www.housingcare.org
Gateshead Council	www.gateshead.gov.uk
Kirklees Council	www.kirklees.gov.uk
London Borough of Barking and Dagenham	www.lbld.gov.uk
London Borough of Barnet	www.barnet.gov.uk
London Borough of Bexley	www.bexley.gov.uk
London Borough of Brent	www.brent.gov.uk
London Borough of Bromley	www.bromley.gov.uk
London Borough of Camden	www.camden.gov.uk
London Borough of Croydon	www.croydon.gov.uk
London Borough of Ealing	www.ealing.gov.uk
London Borough of Enfield	www.enfield.gov.uk
London Borough of Greenwich	www.greenwich.gov.uk
London Borough of Hackney	www.hackney.gov.uk
London Borough of Hammersmith & Fulham	www.lbhf.gov.uk
London Borough of Haringey	www.haringey.gov.uk
London Borough of Harrow	www.harrow.gov.uk
London Borough of Havering	www.havering.gov.uk
London Borough of Islington	www.islington.gov.uk
Royal Borough of Kensington and Chelsea	www.rbkc.gov.uk
Royal Borough of Kingston upon Thames	www.kingston.gov.uk
London Borough of Lambeth	www.lambeth.gov.uk
London Borough of Lewisham	www.lewisham.gov.uk
London Borough of Newham	www.newham.gov.uk
London Borough of Southwark	www.southwark.gov.uk
London Borough of Sutton	www.sutton.gov.uk
London Borough of Tower Hamlets	www.towerhamlets.gov.uk
London Borough of Wandsworth	www.wandsworth.gov.uk
City of Westminster Council	www.westminster.gov.uk
London Open Squares	www.opensquares.org
Manchester City Council	www.manchester.gov.uk
Newcastle City Council	www.newcastle.gov.uk
Oxford City Council	www.oxford.gov.uk
Peabody Trust	www.peabody.org.uk
Places for People	www.placesforpeople.co.uk
Reading Borough Council	www.reading.gov.uk
Sheffield Council	www.sheffield.gov.uk
Urban Splash	www.urbansplash.co.uk
Warrington Borough Council	www.warrington.gov.uk

Appendix A4.2 Checklist – Features of ROS

Physical features		Description	Condition and maintenance			
			Tidy	Casual	Natural	Not maintained
Topography		Flat				
		Slightly sloping				
		Undulating				
		Eminence				
		Steep slope				
		Cliff				
Boundary	Type	Wall				
		Hedge,				
		No barrier				
		Iron railings				
		Wooden fence				
		Topped by glass or razor wire				
		Other				
	Height	No barrier				
		Can step over				
		Can see over				
		Can see through				
		Fully enclosed				
Paths	Route	Record on map				
	Steps	Record on map				
	Material	Gravel				
		Tarmac				
		Brick				
		Concrete				
		Stone				
		Mown grass				
		Worn grass				
		Other				
Litter	Record as condition					
Planting	Location	Record on map				
	Type	Flower beds				
		Raised flower beds				
		Low shrubs <shoulder				
		High shrubs>shoulder				
		Grass				
		Hedges				
Trees	Maturity	Measure at shoulder height	Healthy	Slight damage	Damaged	Dead/dying
	(Please	Sapling circ < 15cm				
	estimate	Young circ 16 - 35cm				
	number	Mid age cir 36- 100cm				
	of each)	Mature cir 100 - 180cm				
		V. mature circ >180cm				

Appendix A4.2 ROS checklist (cont.)						
Trees (cont.)	Variety	How many different species can you see				
			Tidy	Casual	Natural	Not maintained
Features	Water	Formal pond or lake				
		Natural pond or lake				
		Fountain				
		Artificial stream				
		Natural stream				
	Seating (please mark a 'b' if the seat has a back)	Wooden bench				
		Metal bench				
		Stone bench				
		Moveable seats				
		Edge of raised beds				
		Edge of pond				
	Decorative	Other				
		Statue				
		Water Feature				
	Activity	Pergola or arch				
		Playground				
		Tennis Court				
		Bowling green				
		Swimming pool				
		Paddling pool				
		Other				
	Shelter	Summerhouse				
		Gazebo				
		Covered terrace/patio				
		Other				
	Maintenance	Shed				
		Compost Heap				
Sensory Features	Please mark where you are aware of any of the following on the map					
Sound-scape	What can you hear?		Time of day	Far	Near	
	Birds					
	Traffic					
	Aircraft					
	Water					
	Other					
Smell-scape	What can you smell?					
	Flowers					
	Grass					
	Rotting					
	Cooking					
	Urine					
Views	Other					
	Direction	Mark on map				
	Extent	Mark on map				

Your residential outdoor space

Questionnaire



How important is it to you to be able to get outdoors?

How does being outdoors affect your wellbeing and mood?

What is your ideal "good view"?

Even if you have no garden or hate going outdoors, your answers will help us to develop design and management guidelines for the provision of residential outdoor space.



A. QUESTIONS ABOUT YOUR RESIDENTIAL OUTDOOR SPACE

PLEASE NOTE: The questions in this section refer to your individual outdoor space and any outdoor space you share with other residents.

A1. Do you have access to...?
(Tick all that apply)

Your own		Shared/communal
<input type="checkbox"/>	Front garden	<input type="checkbox"/>
<input type="checkbox"/>	Back garden	<input type="checkbox"/>
<input type="checkbox"/>	Patio, terrace or veranda	<input type="checkbox"/>
<input type="checkbox"/>	Yard or equivalent paved area	<input type="checkbox"/>
<input type="checkbox"/>	Balcony	<input type="checkbox"/>
<input type="checkbox"/>	Courtyard	<input type="checkbox"/>
<input type="checkbox"/>	Off-street parking	<input type="checkbox"/>
<input type="checkbox"/>	Outdoor space for bins	<input type="checkbox"/>
<input type="checkbox"/>	Outdoor roofed storage (shed)	<input type="checkbox"/>
<input type="checkbox"/>	Allotment	<input type="checkbox"/>
<input type="checkbox"/>	Other	<input type="checkbox"/>

If you do not have access to any residential outdoor space, please tick this box and go to A10.

A2. Overall, how would you describe the outdoor space you have access to?

Very green
 Fairly green
 Not very green
 Not at all green

A3. Overall, how satisfied are you with your outdoor space?

Your own		Shared/communal
<input type="checkbox"/>	Very dissatisfied	<input type="checkbox"/>
<input type="checkbox"/>	Fairly dissatisfied	<input type="checkbox"/>
<input type="checkbox"/>	Neither satisfied/dissatisfied	<input type="checkbox"/>
<input type="checkbox"/>	Fairly satisfied	<input type="checkbox"/>
<input type="checkbox"/>	Very satisfied	<input type="checkbox"/>
<input type="checkbox"/>	Can't say	<input type="checkbox"/>

A4. What do you like most about your outdoor space?

.....

A5. What would you change about your outdoor space if you could?

.....

A6. What are the main ways in which you and members of your household use your outdoor space in the warmer months? (Please circle how often you usually do each activity: 1 = daily or most days to 5 = never)

Activity	Daily or Most days	At least once a week	At least once a month	Less than once a month	Never	N/A	Tick if you do this in <u>shared</u> space?
Hanging washing out	1	2	3	4	5	6	
Entertaining visitors	1	2	3	4	5	6	
Keeping pets	1	2	3	4	5	6	
Gardening	1	2	3	4	5	6	
Growing your own food	1	2	3	4	5	6	
Eating outside	1	2	3	4	5	6	
Feeding or enjoying wildlife	1	2	3	4	5	6	
Sitting and relaxing	1	2	3	4	5	6	
Talking to neighbours	1	2	3	4	5	6	
Maintaining your car	1	2	3	4	5	6	
Exercising	1	2	3	4	5	6	
Children's play space	1	2	3	4	5	6	
As an access route	1	2	3	4	5	6	
Other (please specify)	1	2	3	4	5	6	

A7. What are the main ways in which you and members of your household use your outdoor space in the colder months? (Please circle how often you usually do each activity: 1 = daily or most days to 5 = never)

Activity	Daily or Most days	At least once a week	At least once a month	Less than once a month	Never	N/A	Tick if you do this in <u>shared</u> space?
Hanging washing out	1	2	3	4	5	6	
Entertaining visitors	1	2	3	4	5	6	
Keeping pets	1	2	3	4	5	6	
Gardening	1	2	3	4	5	6	
Growing your own food	1	2	3	4	5	6	
Eating outside	1	2	3	4	5	6	
Feeding or enjoying wildlife	1	2	3	4	5	6	
Sitting and relaxing	1	2	3	4	5	6	
Talking to neighbours	1	2	3	4	5	6	
Maintaining your car	1	2	3	4	5	6	
Exercising	1	2	3	4	5	6	
Children's play space	1	2	3	4	5	6	
As an access route	1	2	3	4	5	6	
Other (please specify)	1	2	3	4	5	6	

A8. Do you agree or disagree with the following statements about your outdoor space? (Please circle, 1 = strongly disagree and 5 = strongly agree)

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree
I am able to do everything I would like to do in this space	1	2	3	4	5
I can change things in my outdoor space if I want to	1	2	3	4	5
I enjoy using the outdoor space I have access to	1	2	3	4	5
I can relax in my outdoor space	1	2	3	4	5
I can clear my head in my outdoor space	1	2	3	4	5
I like to get fresh air in my outdoor space	1	2	3	4	5
I use my outdoor space like an extra room of the house	1	2	3	4	5
I use my outdoor space when I want peace and quiet	1	2	3	4	5
My outdoor space is very important to me	1	2	3	4	5
I feel safe when I am in my outdoor space	1	2	3	4	5
My outdoor space is easy to get around	1	2	3	4	5
My outdoor space is a comfortable environment	1	2	3	4	5
I like observing the world go by from my outdoor space	1	2	3	4	5
I feel part of the community when in my outdoor space	1	2	3	4	5

A9. Is there anything that stops you or anyone in your household going out into your outdoor space? (Please tick all that apply)

Your own	Shared/communal	Your own	Shared/communal
<input type="checkbox"/>	Noise	<input type="checkbox"/>	Fear of attack
<input type="checkbox"/>	Air quality	<input type="checkbox"/>	Fear of strangers
<input type="checkbox"/>	Accessing space is not easy	<input type="checkbox"/>	The effort involved
<input type="checkbox"/>	Neighbours	<input type="checkbox"/>	Poor maintenance
<input type="checkbox"/>	Lack of privacy	<input type="checkbox"/>	Unattractiveness of space
<input type="checkbox"/>	Weather (rain/wind/ice...)	<input type="checkbox"/>	Not enough space
<input type="checkbox"/>	Fear of falling	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	Unsuitable for children		

Now, thinking about your IDEAL private outdoor space

A10. For you, what would be your ideal private outdoor space?

(Please rank in order, where 1 is your favourite type of space, 2 is your next favourite etc.)

	Rank
Front garden	
Back garden	
Balcony	
Off street parking	
Shared garden	
Allotment	
Other (please indicate)	
.....	
.....	

A11. For you, what would be the most important purposes of your ideal outdoor space?

(Please rank as many as you like where 1 = most important, 2 = the next most important etc.)

I think that it is important for my ideal outdoor space to provide:	
	Rank
Space for visitors e.g. friends/family	
Space for children to play	
Opportunity to garden/grow food	
Space for eating outside	
Space for feeding/enjoying wildlife	
Space to hang washing out	
Space for sitting and relaxing	
An attractive environment	
Space to maintain car or property	
Space for exercise	
Opportunities to chat to neighbours	
Space for storage	
An enhanced image of my home	
Space for pets	
Sufficient space for parking	

B. SOME QUESTIONS ABOUT THE VIEWS FROM YOUR HOME

B1. How important is it for you to have a pleasing view from your home?

- Very important
- Fairly important
- Fairly unimportant
- Very unimportant
- Don't know / Can't say

B2. How satisfied are you with the view from your home?

- Very dissatisfied
- Fairly dissatisfied
- Neither satisfied nor dissatisfied
- Fairly satisfied
- Very satisfied
- Can't say

B3. What best describes all the views from your home?

(Tick all that apply)

- Garden (yours and/or neighbours')
- Countryside
- Street
- Woodland / other wild space
- Park/other maintained green space
- Neighbouring buildings
- Off-street parking or garages
- Outdoor space for waste bins
- Other (please specify)

.....

B4. Overall, how green is the view from the LIVING AREA in your home?

- Very green
- Fairly green
- Not very green
- Not at all green

B5. Roughly how many trees can you see from your LIVING AREA?

- None
- Less than 10
- Between 10 and 50
- More than 50

B6 Thinking about your IDEAL of a pleasing view from your home. Please rank the following features in order of importance (1 = most important)

The following features are the most important components of my ideal view from home	
	Rank
Animals and birds	
Vehicles	
Well kept lawn(s)	
Ability to see a long way	
Trees	
Buildings	
Flowers and Plants	
People	
Water	
Natural greenery	
Well kept borders & beds	
Hills or mountains	
Other (please specify below)	

.....

C. SOME QUESTIONS ABOUT OTHER ASPECTS OF YOUR LIFE...

C1. How satisfied are you with your home?

- Very dissatisfied
- Fairly dissatisfied
- Neither satisfied nor dissatisfied
- Fairly satisfied
- Very satisfied
- Can't say

C2. Would you say that the community spirit in your neighbourhood is...?

- Very strong
- Fairly strong
- Not very strong
- Not at all strong
- Can't say

C3. Thinking about your life, how independent do you feel?

- Very independent
- Fairly independent
- Not very independent
- Not at all independent
- Can't say

C4. To what extent would you agree that you enjoy life?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know / Can't say

C5. How is your health in general?

- Excellent
- Very good
- Good
- Fair
- Poor
- Very poor
- Can't say

C6. Do you have problems with any of the following?

(Please indicate all that apply)

- Eyesight (for reading/close work)
- Eyesight (for getting around)
- Hearing Memory Mobility
- Breathing Other.....
- No such problems

C7. Does this limit your activities?

- Yes No N/A

C8. Roughly how often do you spend the whole day at home?

- Rarely
- Once a month
- 2 or 3 times a month
- Once a week
- 2 or 3 times a week
- Most days

C9. Thinking about your life as a whole, how would you rate your quality of life?

- Very good
- Good
- Fair
- Poor
- Very poor
- Can't say

D. PERSONAL AND HOUSEHOLD INFORMATION

D1. Do you (or another household member) own or rent your home?

- Own outright or with a mortgage/loan
- Pay part rent / part mortgage
- Rent from housing assoc. or council
- Rent from a private landlord

D2. What type of accommodation do you live in?

- Detached house / bungalow
- Semi-detached house / bungalow
- Terraced house / bungalow
- End of terrace house / bungalow
- Flat, maisonette or tenement
- Other (please specify).....

D3. What is the lowest floor level of your living accommodation?

- Basement or semi-basement
- Ground floor (street level)
- First floor (floor above street level)
- Second floor
- Third floor or higher

D4. How long have you lived in your current home?

Years: ____ Months: ____

D5. How many adults (over 18 yrs old) are there in your household, including yourself?

Please state number:.....

D6. How many children are there in your household or who visit you?

Age	In your household	Visit you
0 – 4 years		
5 – 11 years		
12 – 18 years		

D7. Are you:

- Male Female

D8. In what year were you born?

.....

D9. Which of the following best describes your economic status?

- Paid employment/self-employed
- Unemployed/seeking work
- Retired
- Looking after family/home
- Full time student
- Long term sick/disabled
- Other

D10. What work do/did you do?

.....
.....

D11. Which of the following best describes your partner's economic status?

- Not applicable
- Paid employment/self-employed
- Unemployed/seeking work
- Retired
- Looking after family/home
- Full time student
- Long term sick/disabled
- Other

D12. What work does/did s/he do?

.....
.....

D13. To which of these groups do you consider you belong?

- | | |
|--|----------------------------------|
| <input type="checkbox"/> White | <input type="checkbox"/> Mixed |
| <input type="checkbox"/> Black/Black British | <input type="checkbox"/> Chinese |
| <input type="checkbox"/> Asian/Asian British | <input type="checkbox"/> Other |

If there is anything else that you would like to tell us about your outside space or any comment that you would like to make about this questionnaire please use the space below.

--	--	--	--	--

**Thank you very much for your time and help in
completing this questionnaire**

Over the next few months we shall be carrying out further research into people's residential outdoor space. This will involve our researchers visiting people's homes to talk to them about their outdoor space. For those interested in taking part but who would prefer not to be visited, we can arrange to talk on the telephone. We are offering a gift voucher to those who take part.

**PLEASE TICK THIS BOX
if you think you might like to take part
and we will send you further information**

**PLEASE TICK THIS BOX
if you would like to receive a summary report
of our findings**

Personal information used will be processed under the terms of the Data Protection Act. Any information you supply will be used exclusively for the purposes of the research programme and will not be passed to others or used for any other purpose. All information will be published in aggregated form so that individuals cannot be identified. The data will be held securely and disposed of when its purpose for collection is over.

**If you have any queries about this questionnaire, please contact
Nicola Dempsey, Department of Architecture
Tel: 01865 483349 email: ndempsey@brookes.ac.uk**

Appendix A4.4 Covering letter

The Householder
Flat 2
221B, Baker Street
Toytown
TT1 2BB

Your residential outdoor space Questionnaire

Dear Householder

Researchers at Oxford Brookes University are carrying out research as part of a nationwide research consortium called *I'DGO: Inclusive Design for Getting Outdoors*, funded by the UK Engineering and Physical Sciences Research Council. This research project aims to find out how residential outdoor space (such as private and shared gardens, courtyards, parking space and balconies) might affect people's wellbeing.

Your home is located within a carefully selected sample area where there is both general housing and older people's housing. Your responses to our questions will be highly valued. You are under no obligation to fill in this questionnaire as your involvement is completely voluntary. If you would like to take part, we would very much appreciate your time and effort in filling out this questionnaire, which should take no more than 20 minutes to complete. This project has received clearance from the University's Research Ethics Committee but if you have any concerns about the research please contact the Chair of the committee: ethics@brookes.ac.uk

Your answers will be kept strictly confidential, private and anonymous and the data will be kept securely according to the University's policy of Academic Integrity. If you are unhappy answering any of the questions, please leave them blank.

There is also a version of this questionnaire suitable for visually impaired people – please contact us should you require one. Thank you in advance for your help.

If you have any queries about this questionnaire, please contact Lynne Mitchell, Department of Architecture
Tel: 01865 484296 email: lmitchell@brookes.ac.uk



SHARED RESIDENTIAL OUTDOOR SPACE

PARTICIPANT INFORMATION SHEET: INTERVIEW

What is the purpose of the study?

The aim of this part of the research is to find out how people of all ages use private, residential outdoor space (e.g. gardens, parking space) that they share with others. The project will increase our understanding of what design features and maintenance arrangements encourage people to make the best use of and gain the most benefit from such shared outdoor spaces. We have already conducted the large-scale household survey that you contributed to, in a number of UK cities, and are now following up with 40 in-depth interviews. This research began in May 2007 and will end in 2011.

Do I have to take part?

It is entirely up to you to decide whether or not to take part. If you do decide to participate, you are free to stop at any time without giving a reason and to withdraw any unprocessed data that you have given us. There are no foreseeable risks to you in participating in this research apart from generously giving up some of your time. Your contribution will help to improve understanding of how best to design and manage shared residential outdoor space for the benefit all users.

What will I do if I take part?

If you agree to an interview the researcher will visit you in your home to ask you some questions about your outdoor space. (If you prefer not to be visited this conversation can be held on the telephone.) They will ask you to mark key features of the outside space on a plan or map and will ask you specific questions about it (e.g. if there is sufficient shade/sunlight etc.). They will seek your permission to take notes and to audio-record the conversation. It would be useful if you could show them around the space and they may ask you if they could take some photographs or make some sketches.

If you prefer, you could be interviewed by telephone. We would then send you a map of the space so that you could mark on or sketch the most important features prior to the interview. Of course, it would be up to you to decide whether or not to do this. A home interview would take about 1.5 hours and a telephone interview about 1 hour. To thank you for your contribution you would receive a £10 gift voucher.

Will what I say in this study be kept confidential?

All the information collected will be kept strictly confidential (subject to legal limitations). Confidentiality, privacy and anonymity will be ensured through the secure collection, storage and publication of the research material. If you live in a housing scheme your participation will not be communicated to the scheme's owner or manager. Data generated in the course of the research will be kept securely in paper and electronic form for a period of five years after the completion of the research project, in accordance with the University's policy on Academic Integrity.

What will happen to the results of the research study?

The research findings will be published in Amanda Griffin's PhD thesis, journal articles, conference papers, reports and possibly on the website below. Any quotations used will be anonymous. We shall send you a summary of our findings and produce a summary report for the organisations who are contributing to this research (such as housing associations and the Housing Corporation).

Who is organising and funding the research?

This research is being carried out by Amanda Griffin, PhD Student and is supervised by Professor Elizabeth Burton and Lynne Mitchell, Institute of Health, Warwick University. It is part of the I'DGO TOO research, funded by the Engineering and Physical Sciences Research Council (EPSRC). This particular project is trying to understand the experience of residents of all ages over 18, who share outdoor space, while the main focus of I'DGO TOO is on how to improve the design of the outdoor environment to enhance the quality of life of older people. (For more information please visit www.idgo.ac.uk).

What should I do if I want to take part?

If you would like to take part please complete the reply slip and return it to us in the enclosed stamped-addressed envelope or email Amanda Griffin on a.c.griffin@warwick.ac.uk for an electronic version. We will telephone you within the following week to organise a convenient date and time for the interview.

For further information, please contact:

Amanda Griffin, Institute of Health, School of Health and Social Studies, University of Warwick, Coventry CV4 7AL
tel. 01491 838523 email: a.c.griffin@warwick.ac.uk

This research has been approved by the University Research Ethics Committee, Oxford Brookes University.

Thank you very much for taking the time to read this sheet

4 September 2012

**Appendix A4.6 Table of sets of cases with equal values of the variables selected, first 21 sets by number of cases
(Truth Table, Ragin, 2006)**

young	Estab- lished	Middle- aged	mature	older	elderly	Have child	Single adult	Pair of adults	Multiple adults	Child visits	Number of cases	High usage	Raw consist.	PRI consist.	Product
0	1	0	0	0	0	1	0	1	0	1	52		0.75	0.75	0.5625
0	0	0	1	0	0	0	0	1	0	0	42		0.547619	0.547619	0.299887
0	1	0	0	0	0	0	0	1	0	0	41		0.146341	0.146341	0.021416
0	1	0	0	0	0	1	0	1	0	0	40		0.725	0.725	0.525625
0	0	0	0	1	0	0	0	1	0	1	38		0.736842	0.736842	0.542936
0	0	0	1	0	0	0	0	1	0	1	38		0.684211	0.684211	0.468144
0	0	1	0	0	0	0	0	1	0	0	37		0.351351	0.351351	0.123448
0	0	0	1	0	0	0	0	1	0	0	37		0.351351	0.351351	0.123448
0	1	0	0	0	0	0	0	0	1	0	34		0.5	0.5	0.25
0	0	1	0	0	0	1	0	1	0	0	33		0.666667	0.666667	0.444444
0	0	0	0	1	0	0	0	1	0	0	32		0.21875	0.21875	0.047852
1	0	0	0	0	0	0	0	0	1	0	32		0.15625	0.15625	0.024414
0	1	0	0	0	0	0	0	1	0	0	31		0.225806	0.225806	0.050989
0	0	0	0	1	0	0	0	1	0	0	26		0.576923	0.576923	0.33284
0	0	1	0	0	0	1	0	1	0	1	25		0.96	0.96	0.9216
0	0	0	1	0	0	0	0	1	0	0	25		0.48	0.48	0.2304
0	1	0	0	0	0	0	0	0	1	0	25		0.36	0.36	0.1296
1	0	0	0	0	0	0	0	0	1	0	24		0.375	0.375	0.140625
0	0	0	0	0	0	1	0	1	0	0	23		0.434783	0.434783	0.189036
1	0	0	0	0	0	0	0	1	0	0	23		0.217391	0.217391	0.047259
0	0	1	0	0	0	0	0	1	0	0	22		0.409091	0.409091	0.167355

Appendix A4.7 Table of sets of cases with the same values of selected variables in order of consistent with usage of four different activities at least once a week.

Young	Estab- lished	Middle aged	Mature	Older	Elderly	Have child	Single adult	Pair of adults	Multiple adults	Child visits	Number	High usage	Raw consist.	PRI consist.	Product
0	0	0	1	0	0	1	0	1	0	1	2		1	1	1
0	0	0	1	0	0	1	0	0	1	1	2		1	1	1
0	0	1	0	0	0	1	0	0	1	0	2		1	1	1
0	0	0	1	0	0	1	0	1	0	0	2		1	1	1
0	1	0	0	0	0	1	0	0	1	1	1		1	1	1
0	0	0	0	1	0	1	1	0	0	1	1		1	1	1
0	0	0	0	1	0	0	0	0	1	1	1		1	1	1
0	0	0	1	0	0	1	0	0	1	0	1		1	1	1
0	0	0	0	1	0	1	0	1	0	1	1		1	1	1
0	0	1	0	0	0	1	0	1	0	1	25		0.96	0.96	0.9216
0	0	1	0	0	0	1	1	0	0	1	15		0.933333	0.933333	0.871111
0	0	1	0	0	0	1	0	0	1	1	8		0.875	0.875	0.765625
1	0	0	0	0	0	1	0	1	0	1	8		0.875	0.875	0.765625
0	0	0	1	0	0	0	0	0	1	1	6		0.833333	0.833333	0.694444
0	0	0	0	0	0	0	0	0	1	0	6		0.833333	0.833333	0.694444
1	0	0	0	0	0	1	1	0	0	1	6		0.833333	0.833333	0.694444
0	0	0	0	1	0	0	0	0	1	0	6		0.833333	0.833333	0.694444
0	1	0	0	0	0	1	0	1	0	1	52		0.75	0.75	0.5625
1	0	0	0	0	0	1	1	0	0	0	4		0.75	0.75	0.5625
0	0	0	0	0	0	0	0	0	1	0	4		0.75	0.75	0.5625
0	0	0	0	1	0	0	0	1	0	1	38		0.736842	0.736842	0.542936

0	1	0	0	0	0	1	0	1	0	0	40	0.725	0.725	0.525625
0	0	0	1	0	0	0	0	1	0	1	38	0.684211	0.684211	0.468144
0	0	1	0	0	0	1	0	1	0	0	33	0.666667	0.666667	0.444444
0	0	1	0	0	0	0	0	0	1	1	12	0.666667	0.666667	0.444444
0	0	0	1	0	0	0	0	0	1	0	12	0.666667	0.666667	0.444444
0	0	0	0	0	1	0	0	1	0	0	6	0.666667	0.666667	0.444444
0	0	0	0	0	1	0	0	1	0	1	6	0.666667	0.666667	0.444444
0	0	0	0	0	0	1	0	1	0	1	3	0.666667	0.666667	0.444444
0	0	1	0	0	0	0	0	0	0	0	3	0.666667	0.666667	0.444444
0	0	0	0	1	0	0	0	1	0	0	17	0.647059	0.647059	0.418685
0	0	1	0	0	0	0	0	0	1	0	17	0.588235	0.588235	0.346021
0	0	0	0	1	0	0	0	1	0	0	26	0.576923	0.576923	0.33284
0	0	0	0	0	0	0	0	1	0	0	9	0.555556	0.555556	0.308642
0	0	0	1	0	0	0	0	0	1	0	42	0.547619	0.547619	0.299887
0	0	1	0	0	0	1	1	0	0	0	15	0.533333	0.533333	0.284444
0	0	1	0	0	0	0	0	1	0	1	15	0.533333	0.533333	0.284444
0	1	0	0	0	0	0	0	1	0	1	34	0.5	0.5	0.25
0	1	0	0	0	0	1	1	0	0	1	14	0.5	0.5	0.25
0	0	0	1	0	0	1	1	0	0	1	4	0.5	0.5	0.25
0	0	0	0	0	0	1	1	0	0	1	2	0.5	0.5	0.25
0	1	0	0	0	0	0	0	0	0	1	2	0.5	0.5	0.25
0	1	0	0	0	0	0	0	0	1	1	2	0.5	0.5	0.25
1	0	0	0	0	0	1	0	0	1	0	2	0.5	0.5	0.25
0	0	0	1	0	0	0	1	0	0	1	25	0.48	0.48	0.2304
0	0	0	0	0	1	0	1	0	0	1	13	0.461538	0.461538	0.213018

Appendix A6.1. Tables and graphs relating to Chapter 6 - Factors influencing the usage of private, residential outdoor space. Sections 6.2.2 and 6.2.3.

Table 6.3. Distribution of tenure in the four sets

	Shared only		Individual and shared		Individual		No outdoor space	
	No.	Valid Percent	No.	Valid Percent	No.	Valid Percent	No.	Valid Percent
Own outright or with a mortgage or loan	75	26.4%	171	53.9%	423	64.8%	8	33.3%
Pay part rent / part mortgage	11	3.9%	22	6.9%	23	3.5%	3	12.5%
Rent from Housing Association or Council	157	55.3%	87	27.4%	177	27.1%	9	37.7%
Rent from private landlord	41	14.4%	37	11.7%	30	4.6%	4	16.7%
Total	284	100%	317	100%	653	100%		100%
System	9		15		25		1	
	293		332		678		25	

Table 6.5. Lowest floor level of the dwelling

What is the lowest floor level of your living accommodation?

		Frequency	Percent	Valid Percent
Valid	Basement or semi-basement	31	2.3	2.4
	Ground floor (street level)	919	69.0	70.9
	First floor (floor above street level)	173	13.0	13.3
	Second floor	90	6.8	6.9
	Third floor or higher	84	6.3	6.5
	Total	1297	97.4	100.0
Missing	System	34	2.6	
Total		1331	100.0	

Table 6.10. Distribution of era of development across the different sets as a percentage of respondents in each era

	Post-2000	1980-1999	1960-1979	1946-1959	1919-1945	1901-1918	1837-1900	Pre-1837
No space	2%	0%	0%	0%	0%	4%	3%	12%
Shared ROS only	20%	26%	26%	16%	11%	45%	35%	27%
Shared & Individual ROS	35%	6%	16%	15%	8%	4%	12%	12%
Individual ROS only	43%	68%	58%	69%	81%	47%	49%	50%

Table 6.20 Cross-tabulations of type of inequality against proportion of respondents in the SROS set taking part in each activity at least once a week (n=293)

	Roughly even share of outside space	Mostly even, a few dwellings with a greater share	Mostly even, a few dwellings with a lesser share	Mixed range of share of outside space per dwelling
Hanging washing out	19%	38%	34%	
Entertaining visitors	12%	0%	12%	9%
Keeping pets	6%	0%	10%	13%
Gardening	10%	25%	7%	12%
Growing food	3%	0%	0%	6%
Eating outside	8%	13%	0%	11%
Enjoying wildlife	16%	25%	12%	11%
Sitting and relaxing	25%	25%	22%	23%
Talking to neighbours	30%	25%	29%	29%
Maintaining car	5%	0%	2%	6%
Exercising	9%	13%	17%	14%
Children's Play	11%	0%	2%	11%
Access	34%	50%	39%	42%
Other	4%	0%	5%	3%
Number of cases	149	8	41	95

Table 6.21 Cross-tabulations of degree of inequality against proportion of respondents in SROS set taking part in each activity at least once a week (n=293)

	No inequality	Ratio of inequality is about 1:2	Ratio of inequality is about 1:3	Ratio of inequality is 1:4 or more
Hanging washing out	19%	32%	48%	24%
Entertaining visitors	12%	10%	6%	18%
Keeping pets	6%	10%	12%	12%
Gardening	10%	10%	10%	18%
Growing food	3%	4%	4%	6%
Eating outside	8%	8%	4%	18%
Enjoying wildlife	16%	13%	10%	12%
Sitting and relaxing	25%	25%	18%	29%
Talking to neighbours	30%	31%	30%	18%
Maintaining car	5%	3%	6%	12%
Exercising	9%	17%	8%	24%
Children's Play	11%	8%	6%	12%
Access	34%	40%	46%	35%
Other	4%	4%	2%	6%
Number of cases	149	77	50	17

Table 6.23. Cross-tabulations of number of off-road parking spaces per dwelling against proportion of respondents in the SROS set taking part in each activity at least once a week (n=293)

	No off- road parking	Fewer than 1 off-road parking space per dwelling	1 off-road parking space per dwelling	More than 1 off-road parking space per dwelling
Hanging washing out	20%	28%	26%	56%
Entertaining visitors	7%	13%	9%	11%
Keeping pets	7%	7%	9%	22%
Gardening	7%	10%	9%	28%
Growing food	0%	4%	3%	11%
Eating outside	7%	7%	9%	17%
Enjoying wildlife	7%	15%	11%	33%
Sitting and relaxing	24%	27%	12%	39%
Talking to neighbours	11%	33%	29%	44%
Maintaining car	0%	3%	11%	11%
Exercising	2%	13%	14%	17%
Children's Play	4%	10%	11%	6%
Access	20%	43%	36%	39%
Other	2%	4%	5%	0%
Number of cases	46	163	66	18

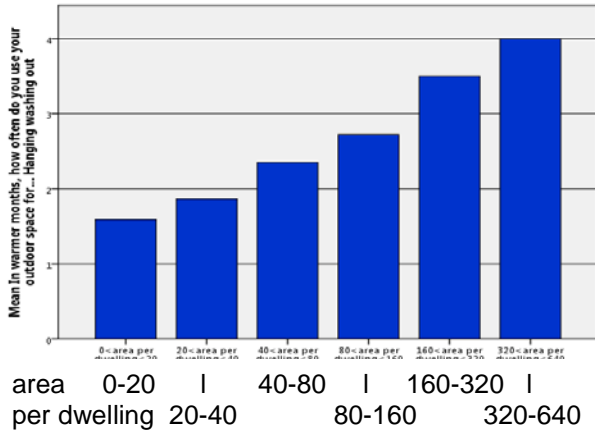
Table 6.24. Cross-tabulations of number of garages per dwelling against proportion of respondents in the SROS set taking part in each activity at least once a week (n=293)

	No garages	Fewer than 1 garage per dwelling	1 garage per dwelling	More than 1 garage per dwelling
Hanging washing out	23%	36%	33%	67%
Entertaining visitors	11%	11%	0%	33%
Keeping pets	5%	12%	25%	33%
Gardening	6%	15%	33%	67%
Growing food	2%	5%	0%	67%
Eating outside	7%	8%	8%	67%
Enjoying wildlife	11%	14%	42%	67%
Sitting and relaxing	23%	25%	25%	67%
Talking to neighbours	25%	35%	42%	67%
Maintaining car	3%	7%	8%	33%
Exercising	7%	20%	25%	33%
Children's Play	10%	8%	8%	0%
Access	35%	40%	33%	100%
Other	5%	2%	0%	0%
Number of cases	186	92	12	3

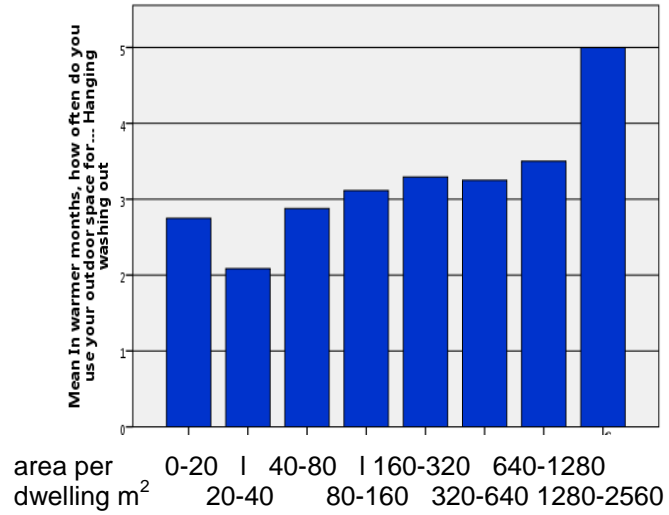
Appendix 6.2 Graphs of mean usage against area of outside space per dwelling

Shared space only (SROS)

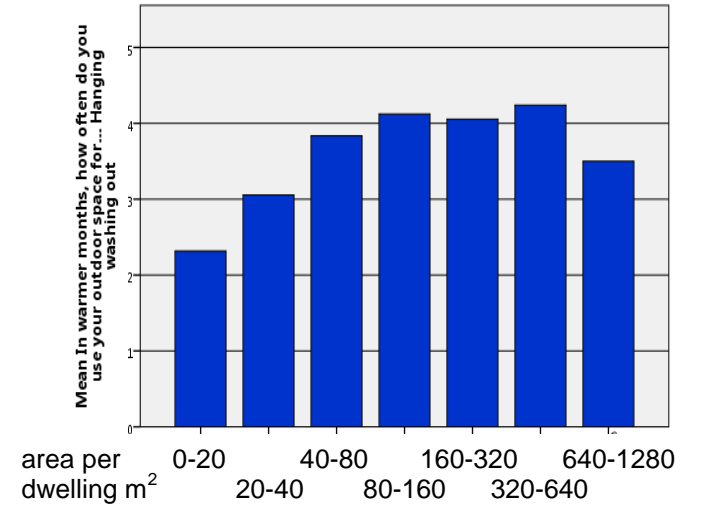
HANGING WASHING OUT



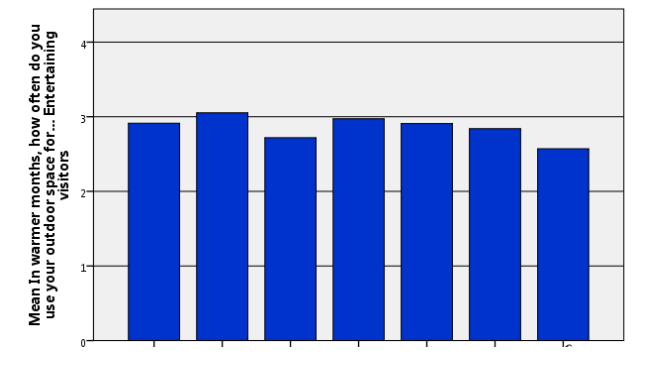
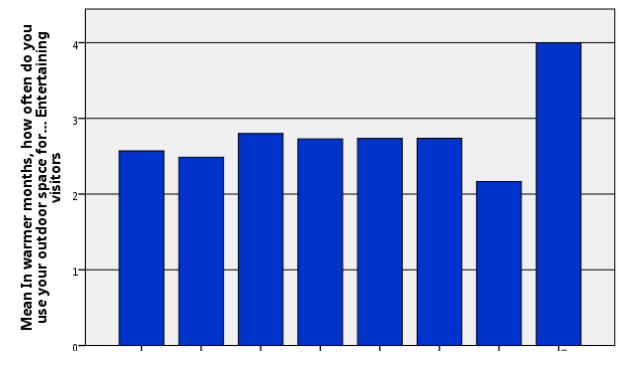
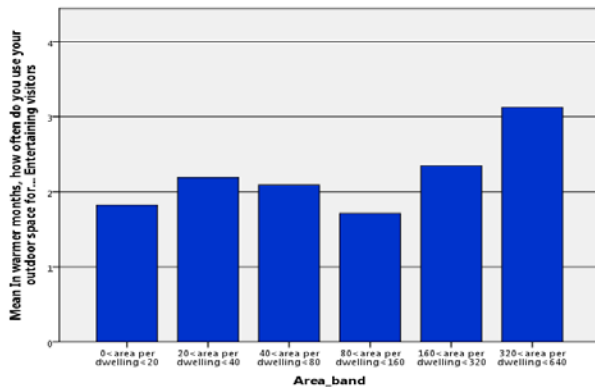
Shared and Individual space (ISROS)



Individual space only (IROS)

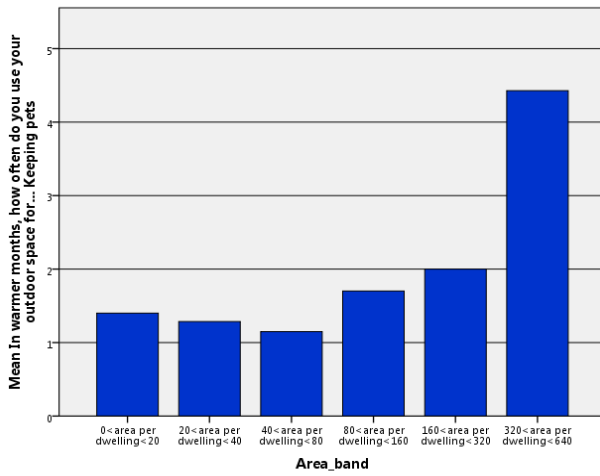


ENTERTAINING VISITORS

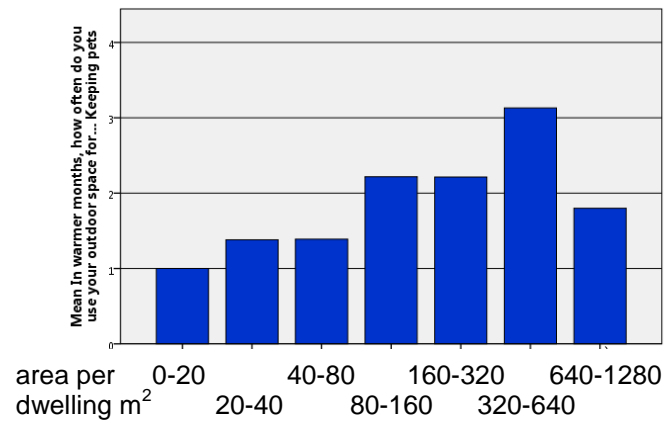


Shared space only (SROS)

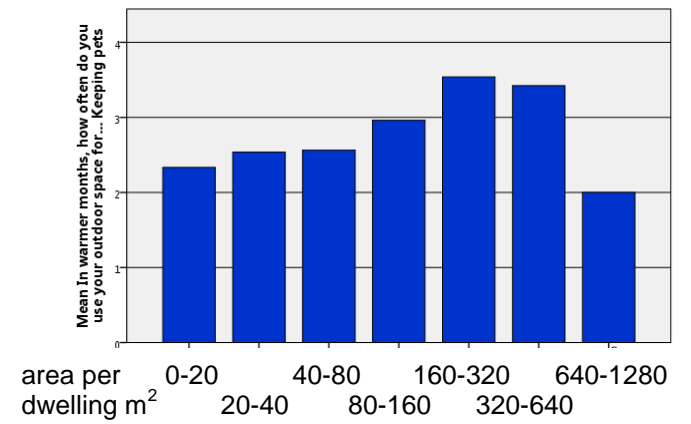
KEEPING PETS



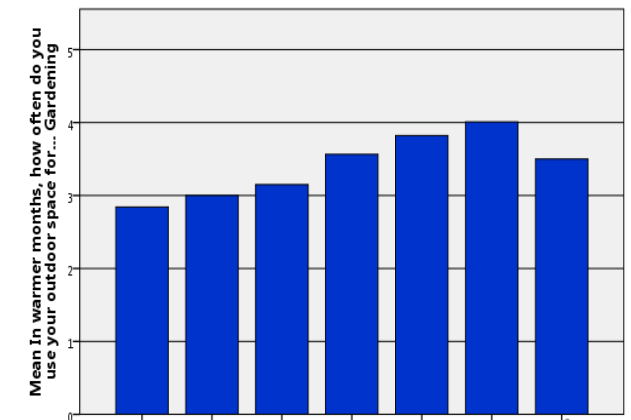
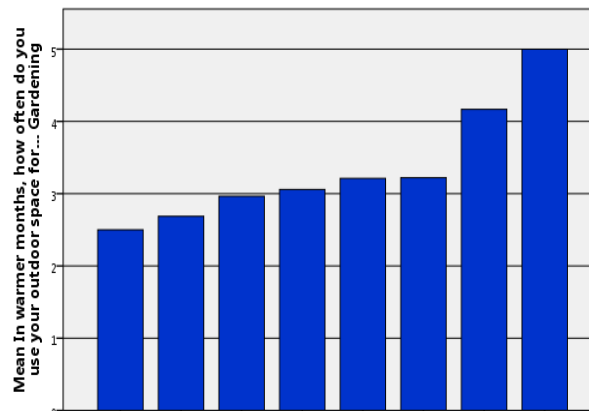
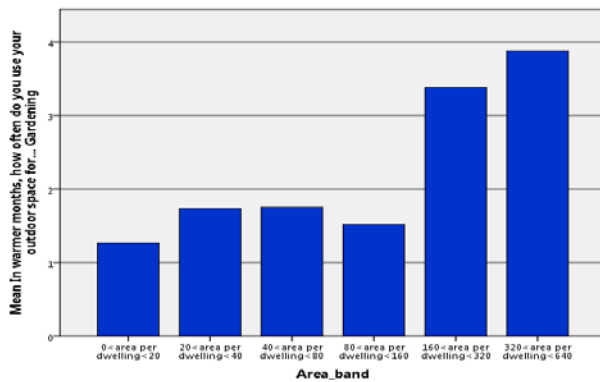
Shared and Individual space (ISROS)



Individual space only (IROS)

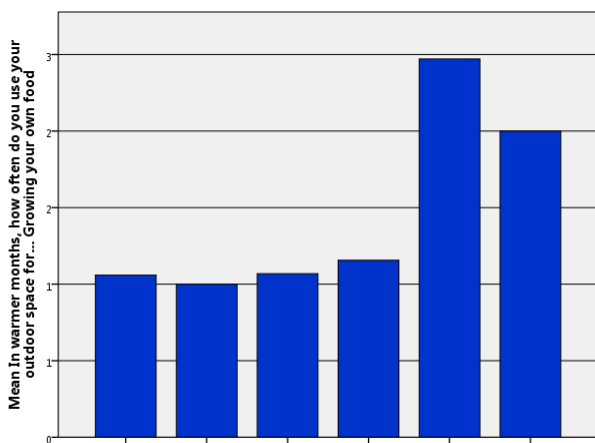


GARDENING



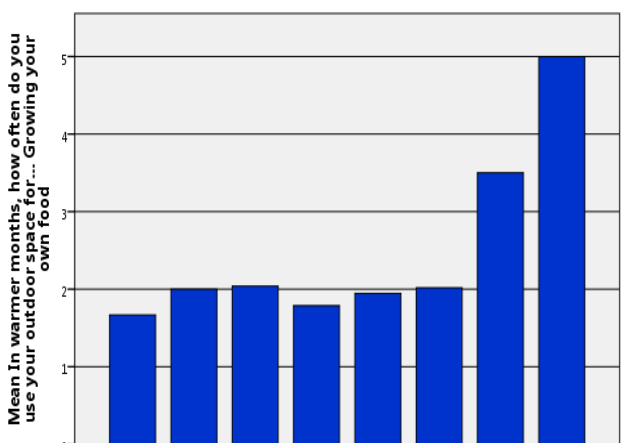
Shared space only (SROS)

GROWING FOOD



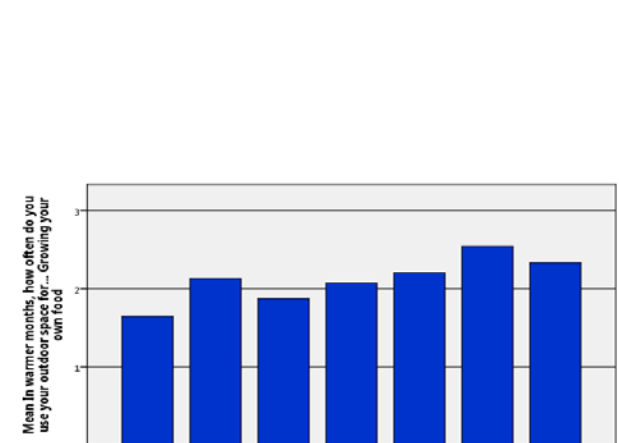
area per dwelling m² 0-20 | 20-40 | 40-80 | 80-160 | 160-320 | 320-640

Shared and Individual space (ISROS)



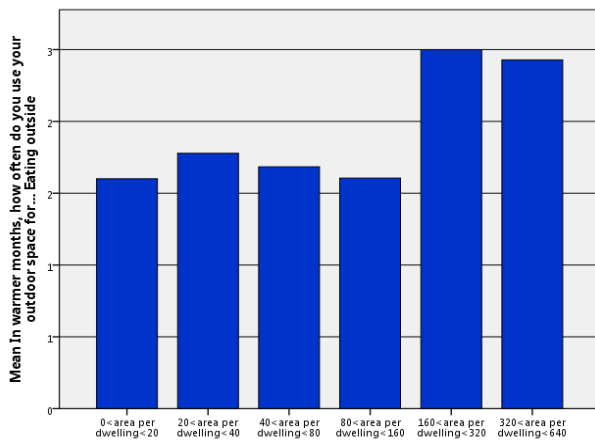
area per dwelling m² 0-20 | 20-40 | 40-80 | 80-160 | 160-320 | 320-640 | 640-1280 | 1280-2560

Individual space only (IROS)

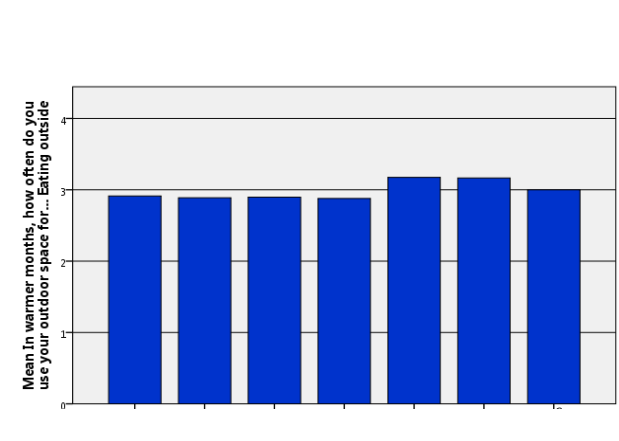
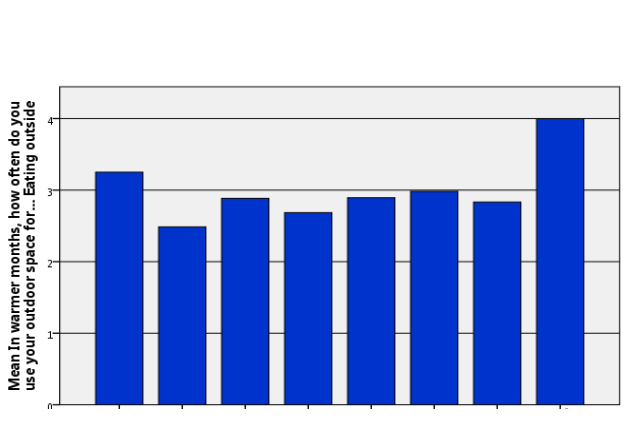


area per dwelling m² 0-20 | 20-40 | 40-80 | 80-160 | 160-320 | 320-640 | 640-1280

EATING OUTSIDE

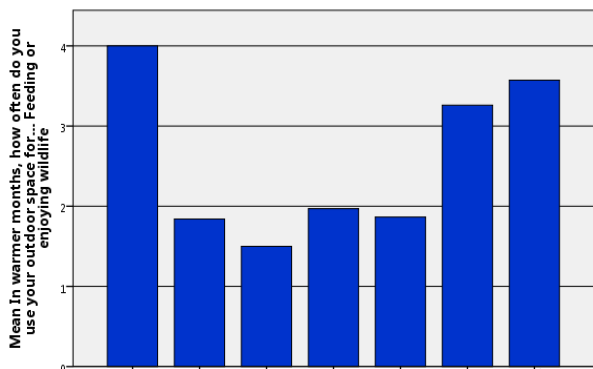


Area_band

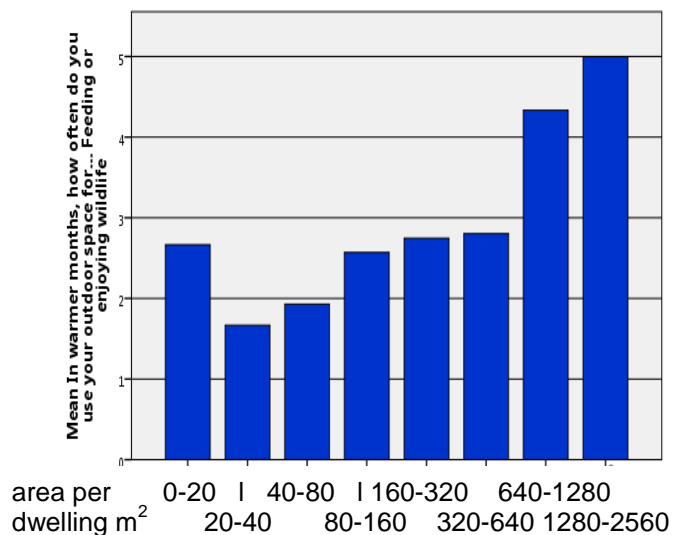


Shared space only (SROS)

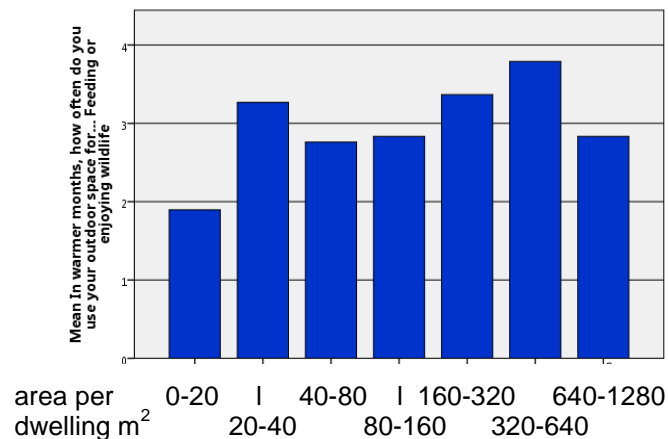
FEEDING OR ENJOYING WILDLIFE



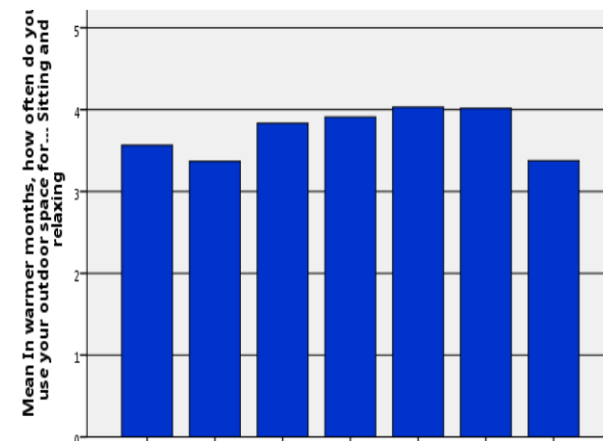
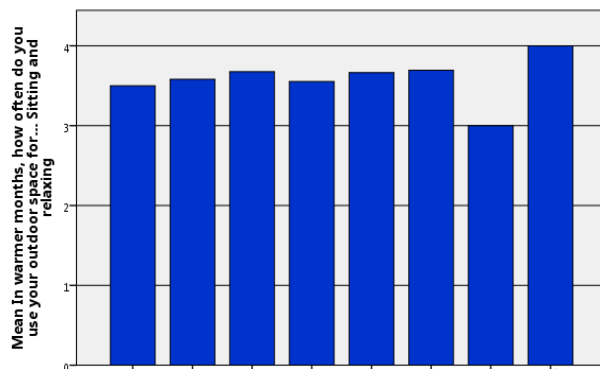
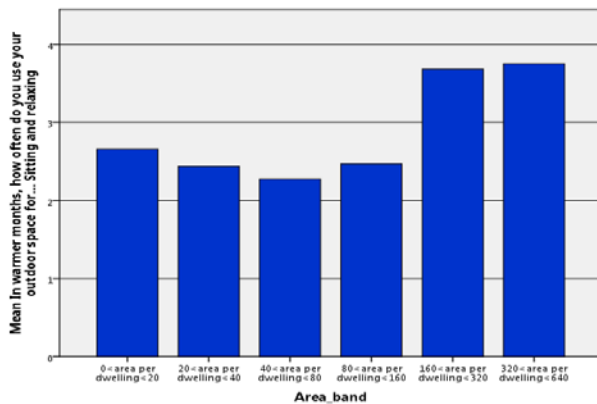
Shared and Individual space (ISROS)



Individual space only (IROS)

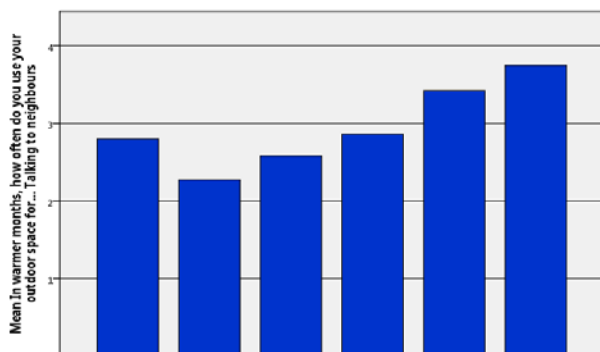


SITTING AND RELAXING



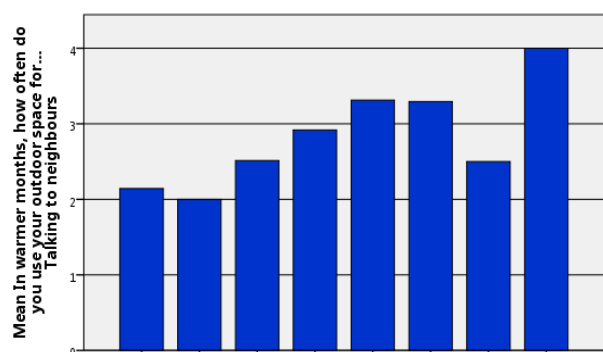
Shared space only (SROS)

TALKING TO NEIGHBOURS



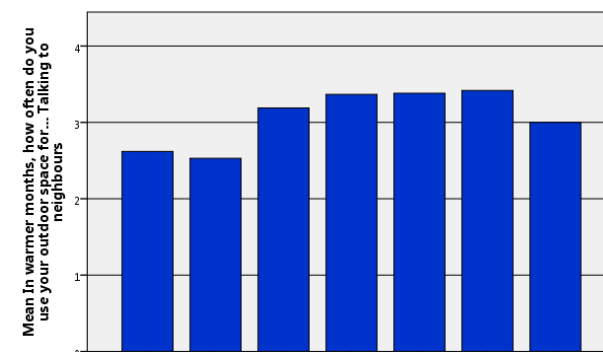
area per dwelling m² 0-20 | 20-40 | 40-80 | 80-160 | 160-320 | 320-640

Shared and Individual space (ISROS)



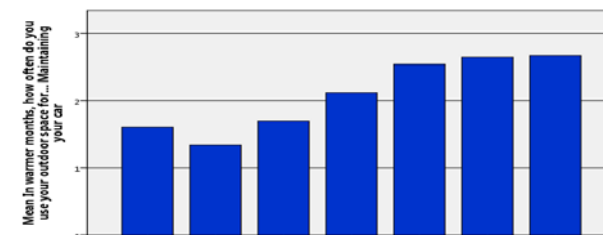
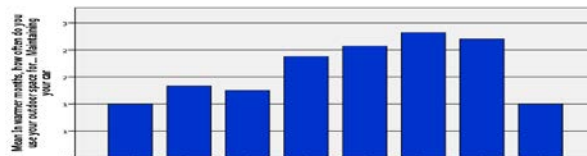
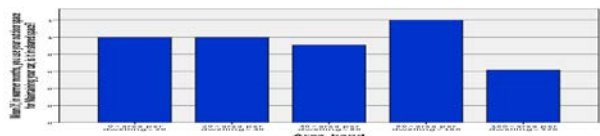
area per dwelling m² 0-20 | 20-40 | 40-80 | 80-160 | 160-320 | 320-640 | 640-1280 | 1280-2560

Individual space only (IROS)



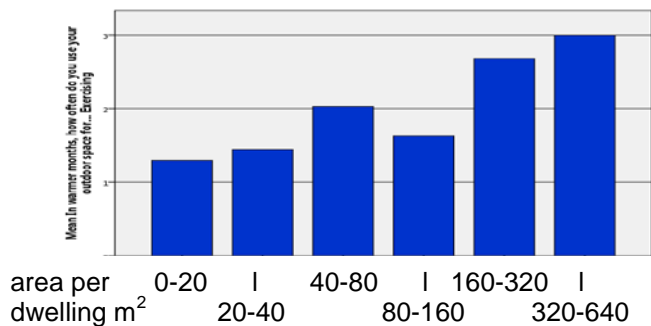
area per dwelling m² 0-20 | 20-40 | 40-80 | 80-160 | 160-320 | 320-640 | 640-1280

MAINTAINING A CAR

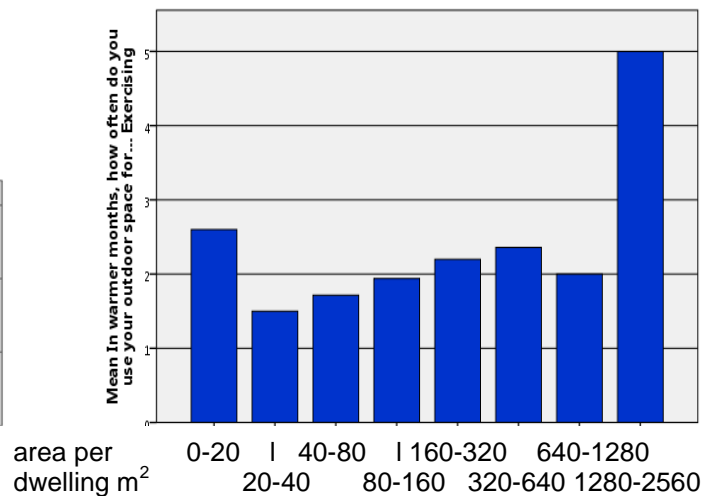


Shared space only (SROS)

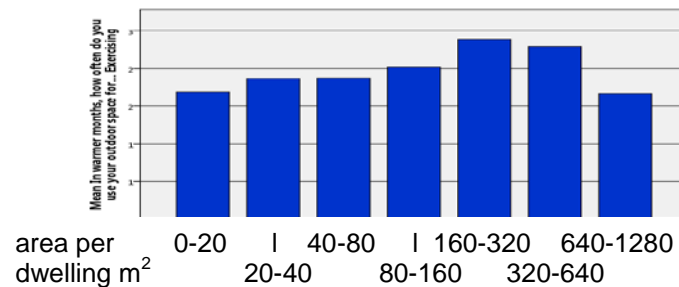
EXERCISING



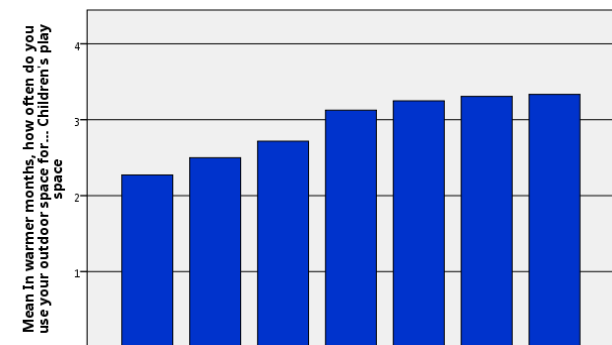
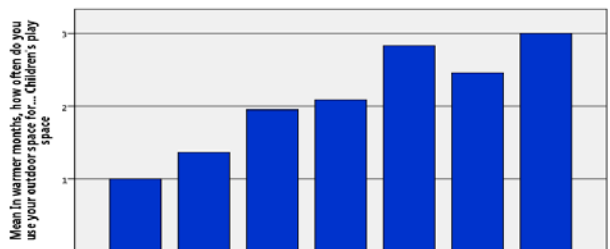
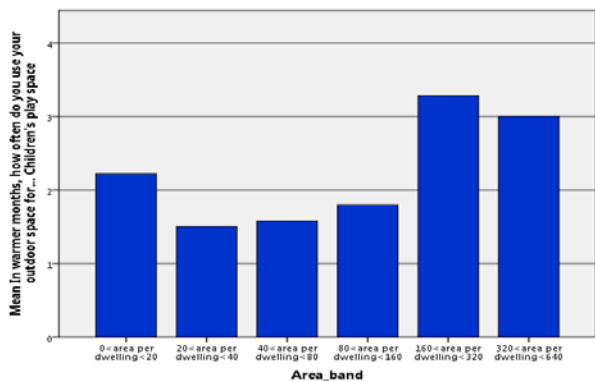
Shared and Individual space (ISROS)



Individual space only (IROS)

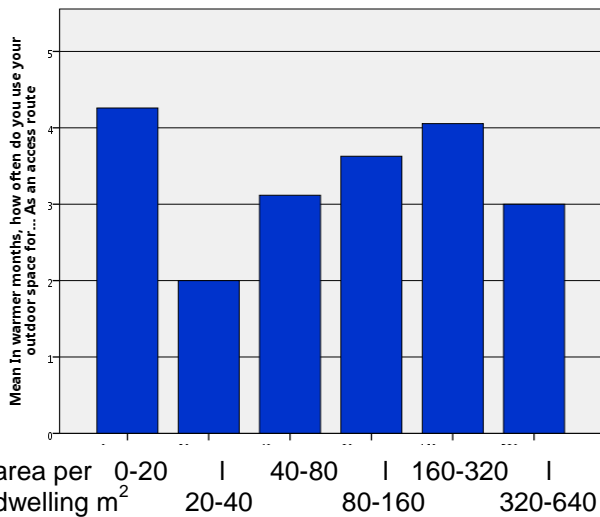


CHILDREN'S PLAY SPACE

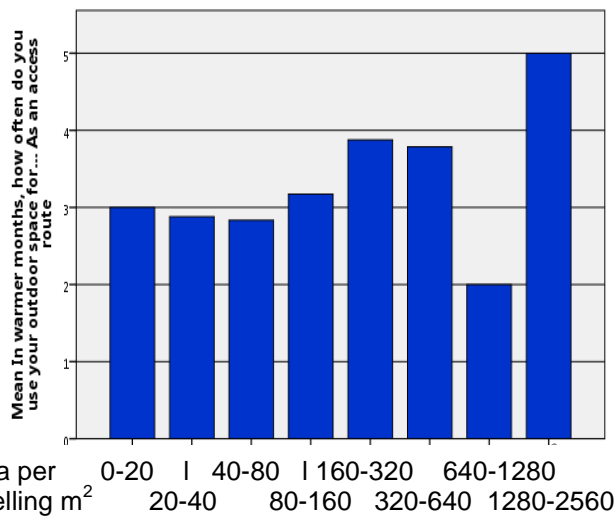


Shared space only (SROS)

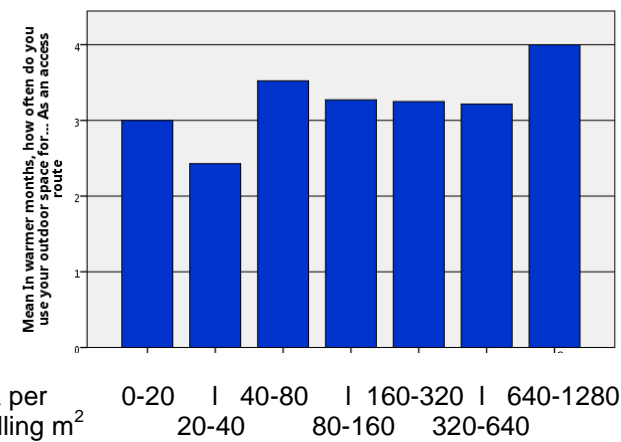
ACCESS ROUTE



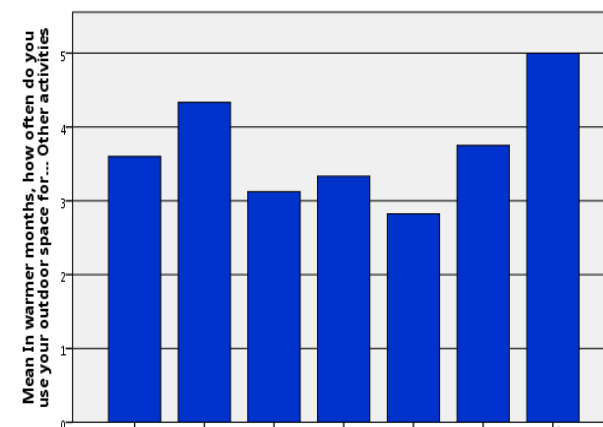
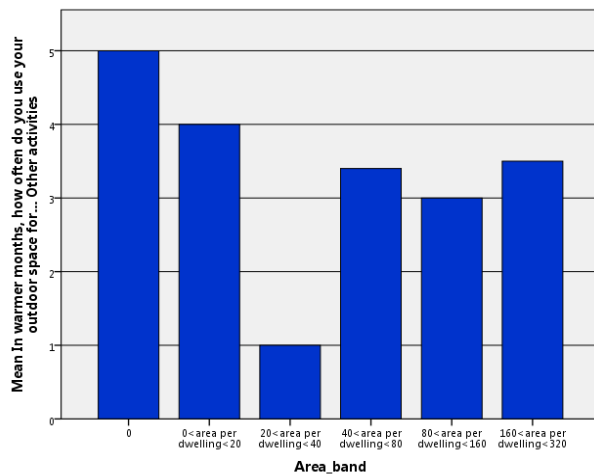
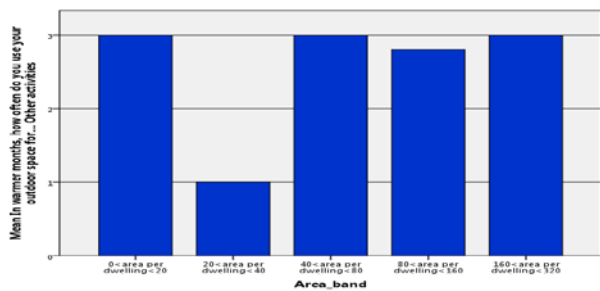
Shared and Individual space (ISROS)



Individual space only (IROS)



OTHER



Appendix A6.3 Tables and graphs relating to Chapter 6 – Factors influencing the usage of private, residential outdoor space. Section 6.2.4.

Table 6.31 Employment status of respondents and their partners

		Employment status of respondent			Employment status of partner		
		Fre- quency	Percent	Valid Percent	Fre- quency	Percent	Valid Percent
Valid	Paid employment / self-employed	718	54%	57%	477	36%	67%
	Unemployed or seeking work	69	5%	5%	18	1%	3%
	Retired	295	22%	23%	137	10%	19%
	Looking after family and/or home	84	6%	7%	36	3%	5%
	Full time student	19	1%	2%	18	1%	3%
	Long term sickness or disabled	79	6%	6%	25	2%	4%
Sub-total		1264	95%	100%	711	53%	100%
Miss- ing	Other	19	1%		14	1%	
	Not applicable				468	35%	
	System	45	4%		135	10%	
Sub-total		64	5%		617	47%	
Total		1328	100%		1328	100%	

Table 6.36 Number of adults in each household in each set

How many adults (over 18 yrs old) are there in your household, including yourself?								
	Shared only (SROS)		Individual & shared (ISROS)		Individual only (IROS)		Whole sample	
	Number	Valid Percent	Number	Valid Percent	Number	Valid Percent	Number	Valid Percent
1	292	49.4%	134	41.7%	211	32.2%	521	40.9%
2	257	43.5%	159	49.5%	368	56.1%	633	49.7%
3	27	4.6%	18	5.6%	50	7.6%	77	6.0%
4	11	1.9%	8	2.5%	18	2.7%	29	2.3%
5	2	0.3%	1	0.3%	8	1.2%	10	.8%
6	1	0.2%	1	0.3%		0.2%	1	.1%
7	1	0.2%					1	.1%
10					1		1	.1%
		100%		100%		100%	1273	100.0%
Total	591		321		656			
Miss- ing	34		11		22		55	
Total	625		332		678		1328	

Appendix A6.4. Tables and graphs relating to Chapter 6 – Factors influencing the usage of private, residential outdoor space. Section 6.2.5.

Table 6.39 Cross-tabulations of residential location against proportion of respondents in the SROS set doing each activity at least once a week in the warmer months (n=293)

	Shops within 300m	Shops further than 300m	Shops further than 300m and site on settlement edge
Hanging washing out	22%	38%	21%
Entertaining visitors	11%	12%	5%
Keeping pets	7%	12%	5%
Gardening	8%	16%	11%
Growing food	1%	6%	11%
Eating outside	5%	11%	16%
Enjoying wildlife	10%	19%	21%
Sitting and relaxing	20%	29%	26%
Talking to neighbours	26%	35%	26%
Maintaining car	5%	6%	0%
Exercising	9%	17%	11%
Children's Play	8%	10%	16%
Access	37%	36%	47%
Other	4%	3%	5%
Number of cases	171	103	19

Table 6.40 Distribution of types of public outdoor space within 300 metres of dwelling.

	SROS	ISROS	IROS	NROS	Whole sample
Public square / plaza/village green	33%	24%	44%	28%	36%
Park/playground	36%	37%	19%	24%	27%
Beach/coastline	10%	17%	9%	28%	11%
River/canal tow path	3%	12%	8%	0%	8%
Recreation ground/playing field	5%	4%	10%	8%	7%
Nature reserve / countryside/common	5%	2%	4%	4%	4%
No public open space except roads	7%	3%	3%	0%	4%
Other	1%	2%	3%	8%	2%
Number of cases	293	332	678	25	1328

Table 6.42 Cross-tabulations of type of nearby public outdoor space against proportion of respondents in the SROS set doing each activity at least once a week in the warmer months. (n=293)

	Type of public outdoor space							
	No public open space except streets	Any public open space	Park/Play-ground	Recreation ground /playing field	Public square /plaza/ village green	Nature reserve /country-side/ common	River/ canal tow path	Beach/ coast-line
Hanging washing out	30%	26%	25%	21%	34%	27%	50%	10%
Entertaining visitors	0%	11%	6%	0%	20%	20%	10%	10%
Keeping pets	5%	8%	8%	0%	10%	20%	0%	7%
Gardening	0%	11%	6%	14%	16%	13%	10%	17%
Growing food	0%	3%	3%	0%	5%	0%	20%	0%
Eating outside	0%	8%	9%	0%	9%	0%	10%	10%
Enjoying wildlife	30%	12%	7%	29%	15%	20%	30%	13%
Sitting and relaxing	25%	22%	19%	36%	27%	33%	40%	17%
Talking to neighbours	30%	27%	26%	36%	35%	40%	20%	17%
Maintaining car	5%	4%	5%	0%	3%	7%	0%	13%
Exercising	0%	12%	8%	29%	18%	13%	20%	7%
Children's Play	15%	8%	14%	0%	4%	0%	20%	10%
Access	40%	35%	44%	36%	35%	33%	30%	23%
Other	15%	7%	1%	14%	2%	7%	20%	37%
Number of cases	20		106	14	96	15	10	30

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