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Social inclusion and the urban renaissance without the car

Julie Clark

Doctoral thesis conducted in the College of Social and Political Sciences.
Submitted in fulfilment of the requirements for the Degree of Doctor of
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Declaration of Authorship

I certify that the work presented here is, to the best of my knowledge and belief, original and the result of my own investigations, except as acknowledged, and has not been submitted, either in part or in whole, for a degree at this or any other University.

Signature

Date

Abstract

The urban renaissance seems to present a win-win scenario for social policy, promising greater social inclusion along with lower levels of car ownership and use. This thesis aims to evaluate the extent to which an urban renaissance might reduce levels of car ownership without inhibiting social inclusion and assess the potential for de-coupling rising family incomes from increasing levels of car ownership and use. A sequential mixed-methods research design is used to investigate the relationships between social inclusion and mobility within an urban context from two perspectives: the first phase of the research uses bivariate analysis and multiple logistic regression to test the relative importance of social inclusion, demographic determinants and spatial factors as a means of understanding household car ownership; the results of these analyses inform the second phase of the research, which adopts a case study approach in order to understand the role of social inclusion and urban form in modulating driver behaviour. A hybrid narrative/semi-structured interview technique allows longitudinal insights into the perspectives of residents from four urban areas, varying by density and centrality.

Quantitative analysis, sampling the general population of Great Britain, indicates that inclusion on the dimensions of civic and social interaction is independent of level of car ownership. Furthermore it is shown that the impact of household income on levels of car ownership is mediated by urbanisation on three spatial tiers: settlement, neighbourhood and property levels. The qualitative phase confirms different patterns of car *use* as well as of car *ownership* across different urban areas, demonstrating that radical (and unplanned) changes in modal choice can follow relocation to more dense and central urban environments. The size and perceived quality of residential properties, along with the presence of greenspace and local shops, can build place attachment to relatively dense urban environments; increased levels of walking and consequent familiarity with other local residents were found to be core components of this process.

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DEFINITIONS /ABBREVIATIONS

ASBO	Anti-Social Behaviour Order
B-SEM	Bristol Social Exclusion Matrix
BHPS	British Household Panel Survey
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CfIT	Commission for Integrated Transport
CO	Cabinet Office
CRSIS	Centre for Research into Socially Inclusive Services
DfT	Department for Transport
DoT	Department of Transport
DRT	Demand-Responsive Transport
DCLG	Department of Communities and Local Government
DETR	Department of the Environment, Transport and the Regions
DHC	Derek Halden Consultancy
DWP	Department of Work and Pensions
EC	European Commission
ECHP	European Community Household Panel
ESRC	Economic and Social Research Council
EU	European Union
FES	Family Expenditure Survey
GCPH	Glasgow Centre for Population Health
GHS	General Household Survey
HBAI	Households Below Average Income
IMD	Indices of Multiple Deprivation
ISER	Institute for Social and Economic Research
MUD	Moral Underclass Discourse
OECD	Organisation for Economic Cooperation and Development
ODPM	Office of the Deputy Prime Minister
ONS	Office of National Statistics
PSE	Poverty and Social Exclusion (survey)
RED	Redistributive Discourse
SACTRA	Standing Advisory Committee on Trunk Road Assessment
SE	Scottish Executive
SETF	Social Exclusion Task Force
SEU	Social Exclusion Unit
SHARP	Scottish Health Housing and Regeneration Project
SID	Social Integrationist Discourse
SIMD	Scottish Index of Multiple Deprivation
SPT	Strathclyde Partnership for Transport
SQUIN	Single Question-Inducing Narrative
TDM	Travel Demand Management
UTF	Urban Task Force
WCED	World Commission on Environment and Development

1 Social Inclusion, Car Ownership and Use: Key Tensions

1.1 Introduction

This thesis centres on the relationship of social inclusion to car ownership/use within an urban context. The opening chapter provides an initial outline of the tensions between car transport and the broad concept of social inclusion. Following this, the overarching aim and subsidiary objectives of the research are defined. At that stage, the underlying methodology of the research is presented and the strategy of the inquiry is introduced. After this, the chapter closes as the structure of the thesis is laid out.

1.2 The Core Problem Area

1.2.1 The Income-Ownership Orthodoxy

The orthodox view of the relationship between income and car ownership is that rising levels of income will mean rising levels of car ownership (Greenman, 1996, documents this tradition). This relationship seems to exist across different scales of measurement, from the level of GDP to the number of cars per household by income, as illustrated in Figure 1.1 overleaf (Dargay and Gately, 1997).

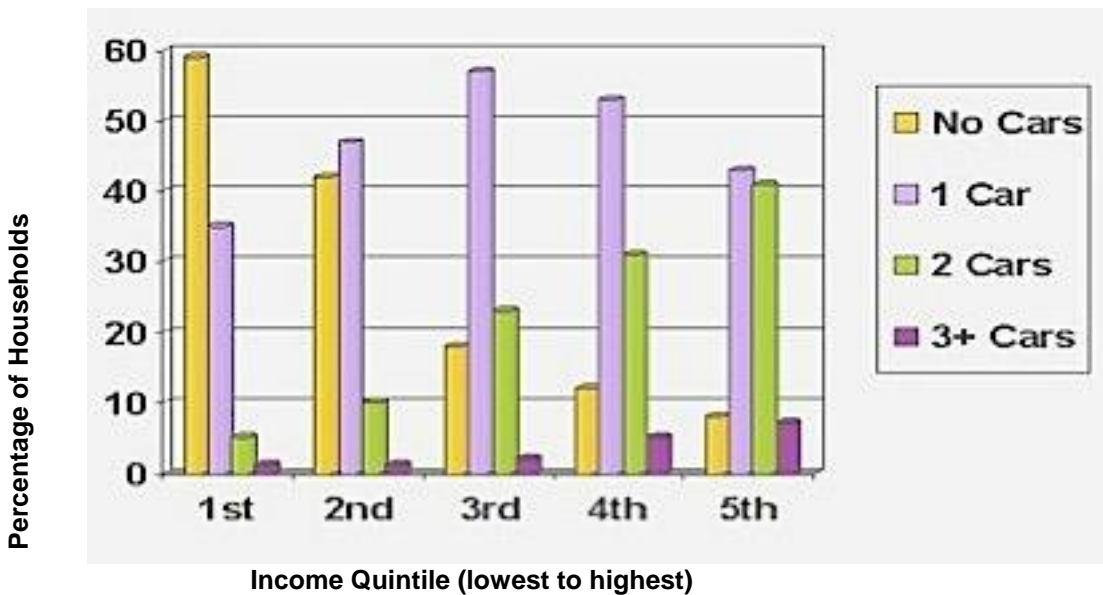


Figure 1.1 Levels of Car Ownership (% households) by Income Quintile

Not only do levels of car ownership increase with income; Begg (1998) has noted an “amplifier effect” of the car on personal mobility (see Box 1.1, p.3). Drivers travel more frequently than non-drivers and even the non-driving members of a car-owning household travel more often and further than those in carless households. Furthermore, these are additional journeys, which would not have been made by alternative means (Vigar, 2002).

To add insight into the scale as well as the dynamic of the income-ownership correlation of these changes, levels of car ownership doubled between 1975 and 1995, the proportion of households with two cars rose from 7% in 1970 to 30% in 2003, and road traffic has grown by 81% since 1980 (Banister, 2005; Department for Transport, 2006b; Office for National Statistics (ONS, 2006).

Box 1.1: The Amplifier Effect – Having a Car in the Household**The Amplifier Effect - having a car in the household**

- People living in households with a car made nearly 50 per cent more trips per person per year in 2002 than people in households without a car.
- In households with cars, main drivers made over 1,200 trips a year compared with other drivers who made over 1,000 trips and non-drivers who made fewer than 900 trips.
- A similar pattern is seen for distance travelled per person per year, with main drivers doing nearly three and a half times more mileage than people in households without a car.

Source: DfT, 2006a

1.2.2 The Car and the Inclusion/Exclusion Paradox

The significance of the growth in car ownership/use is given greater resonance when the complex relationship between the car and social inclusion is considered. Although social inclusion will be further outlined later (see Sections 1.2.3 and 2.3.1.), at this stage it is appropriate to give a working definition:

“An individual is socially excluded if he or she does not participate in key activities of the society in which he or she lives.”

(Burchardt *et al.*, 2002, p.30)

Within this context, the car occupies the paradoxical position of simultaneously supporting and negatively impacting upon social inclusion. Access to private transport unquestionably provides benefits; however, the dominance of the car and the wider impacts of car ownership give rise to a number of environmental, economic and social concerns (Black, 2000; Goodwin, 1999; Hine and Mitchell, 2003).

Social Inclusion and the Car - Benefits

The primary benefit of car access is that of mobility - the potential for movement, based on travel distance and speed - the traditional stock-in-trade of transport planners (Marshall, 2005). With the mobility a car affords comes improved access to the full range of participatory activities.

Census data confirms that non-car users are almost twice as likely to report difficulties in accessing services; notably, inhabitants of deprived or rural areas report only slightly more difficulty than urban dwellers (ONS, 2001). Car ownership is also associated with improved health, partially because of a correlation between car ownership and other socio-economic factors which are associated with better health, but also because car ownership provides psychosocial benefits, such as feelings of autonomy, protection, and prestige, *additional* to those related to economic status (Ellaway *et al.*, 2003; Hiscock *et al.*, 2002; Kearns *et al.*, 2000).

Social Inclusion and the Car - Disbenefits

The negative impacts of the car upon social inclusion also cover environmental, economic and social territory. Throughout the lifecycle of the car, acquisition of raw materials, manufacture, fuel, maintenance, running and disposal all generate externalities in terms of emissions covering air, water, noise, and ground pollution (Reid, 1995). Congestion is a stress on infrastructure, drivers, other road users including pedestrians, and business (Grant-Muller and Laird, 2006). Beyond environmental impacts, injuries and fatalities entail economic and human costs. More perniciously, traffic creates an uncongenial environment, inimical to everyday exercise and social interaction (Appleyard, 1981; Shaw *et al.*, 1999).

However, perhaps the most far-reaching impact of the dominance of the car lies in its effect on land use patterns. Freed from the constraint of following

established public transport routes, urban activities have become dispersed, expanding with the shift from the walking city, to the transit city, to the automobile city (Muller, 2004). Allied to this development, increasing social isolation is theorised as an impact of widespread car use, partially resulting from road infrastructure creating physical barriers across and between communities - the concept of community severance (Whitelegg, 1994). Additionally, the increasing separation of work from home from social and leisure activities fosters isolation and a polarisation between those possessing and those lacking access to private transport (Adams, 1999), problematising the status of the private car within the modal mix of transport options (Table 1.1).

Table 1.1: Modal Mix for Land Transport

Source: developed from Dudleston *et al.* (2005) and Stradling and Anable (2008)

Fully Self-Propelled	Augmented	Fuelled (Public)	Fuelled (Private)
<ul style="list-style-type: none"> ▪ Walking 	<ul style="list-style-type: none"> ▪ Bicycle 	<ul style="list-style-type: none"> ▪ Bus ▪ Train ▪ Taxi¹ 	<ul style="list-style-type: none"> ▪ Car <ul style="list-style-type: none"> - as driver - as passenger ▪ Motorbike/ moped

The car is frequently regarded as merely one of many possibilities in a “modal mix” of travel options. However, as Table 1.1 shows, these can be categorised by their differential impact on the traveller and the wider environment. The fully self-propelled and augmented ‘active travel’ modes on the left-hand side of the table involve more physical exercise and reduced environmental impact; the converse applies to the fuelled modes on the right-hand side of the table. Although Hathaway (2000) notes that most trips involve some element of walking, bus and train travel (necessarily involving travel to a bus stop or train station) are less associated with door-to-door conveyance than the private fuelled modes. Hence, the public fuelled modes are more closely associated than the private modes with active travel. Sloman in particular castigates car

¹ Shared taxi schemes in particular have been considered as a means of alleviating mobility problems in rural areas (MacDonald, 2008).

travel for making us fat (2006). Nonetheless, as Ogilvie observes, car use may involve walking to and from parking facilities (2007).

Furthermore, the context of social inclusion provides arguments for understanding personal transport as competition to, rather than as a complement of, other modes. Firstly, demand for private transport diverts resources from other modes (Pucher and LeFevre, 1996). Secondly, the disappearance of mixed land-use areas entails both a combination of greater geographic spread of destinations and a reduced customer base. This can precipitate a vicious cycle of higher fares and reduced public transport frequency, increasing the need for a car to fully participate in economic and social opportunities (Turton and Knowles, 1992).

This aspect of car use also influences participation opportunities more intimately: it limits opportunities to build social capital at local level by reducing interaction between friends and neighbours (Appleyard, 1981; Putnam, 2000). Moreover, the negative correlation between car use and other more social forms of transport, such as walking, will also inhibit the making of light social ties through casual interactions at local level (Granovetter, 1973; ONS, 2006; Pucher, 2002).

Distribution of Benefits and Impacts

As a research area, car ownership/use and social inclusion can be seen as a significant field because of its dual nature, providing strong benefits alongside diverse negative impacts. However, its significance runs still deeper when the distribution of benefits and disbenefits is considered.

The distribution of benefits is complex, dispersed along economic, social, community and spatial axes. As shown in section 1.2.1 above, car ownership correlates strongly with income, awarding maximum mobility to those already most economically advantaged: “the preservation of mobility for the better

off” (Carter, 1981, p.3). However, further social gradations complicate the picture: the elderly, female and those with reduced physical ability have less access to private transport (Hine and Mitchell, 2003). Furthermore, one of the challenges of inclusive transport provision involves the erratic distribution of need, which Hine and Grieco analyse in terms of both spatial and temporal scatters and clusters (2003). Beyond other socioeconomic differentiations, *private* transport’s nature tends to personalise its benefits - affecting drivers and their close family/ acquaintances. The disbenefits function at both community and personal levels. Environmental justice literature demonstrates these disbenefits’ disproportionate impact on disadvantaged communities (Bullard, 1999; Burningham and Thrush, 2002; Walker *et al.* 2005).

1.3 Aims and Objectives

The overarching aim of the research is to evaluate the extent to which an urban renaissance could reduce levels of car ownership without inhibiting social inclusion. Further to the overarching aim, the research also aims to assess the potential for de-coupling rising family incomes from increasing levels of car ownership and use and ultimately, to identify robust strategies for reducing levels of car ownership and use without inhibiting social inclusion. The specific objectives set in order to fulfil these aims are:

1. To analyse how levels of car ownership relate to key dimensions of social inclusion and any intervening role of spatial scale in relation to car ownership and those different dimensions of social inclusion.
2. To theorise the mechanisms through which built form impacts upon car ownership use by exploring the experiences of, and attitudes towards, urban travel held by driving and non-driving urban dwellers.

3. To investigate how these travel choices might relate to urban dwellers' perceptions of social inclusion or exclusion.

1.4 Research Design and Methodological Implications

1.4.1 Research Strategy and the Mixed Methods Approach

The relationship of social inclusion to car ownership/use can be defined as a commons problem - one requiring collective action to resolve. The nature of the core problem therefore, as well as one of the research objectives outlined above, rendered this thesis to some extent policy research from the beginning. In common with much policy research, this thesis adopts a pragmatist *methodological toolkit* approach, prioritising selection of method as fit for purpose, that is, appropriate to the research question (Mason, 2002; Seale, 1999; Snape and Spencer, 2003).

Combining qualitative and quantitative methods permits depth in exploring the nature of phenomena identified whilst contextualising that information in terms of the possible scope of results through robust frequency measurements (Ritchie, 2003; Kelle, 2005). Similar complementarities exist between qualitative and quantitative work, where one can provide an initial guide to case selection, whilst the other can facilitate explaining statistical findings and identifying unknown variables (Bryman, 2005; Kelle, 2005). Furthermore, when employed iteratively or sequentially, the results from each data source can broaden the original research plan and be used to inform the next method, building a more detailed picture of the issues involved (Oppenheim, 1999). This form of triangulation, rather than simply seeking to corroborate results, produces different kinds of knowledge, which may complement or contradict one another, creating a bigger picture (Brannen, 2005). This last strength of

mixed methods lies in their potential to generate new perspectives (Greene *et al.*, 1989).

The research aims seek insight into the interconnections between transport choice and social interaction within an urban context. Mixed methods provide an ideal tool in service of policy research in that a quantitative approach can produce generalisable findings, providing a powerful means of managing the distribution of resources; at the same time, as *social* policy, exploring and understanding the concerns of stakeholders is perceived as fundamental to success. Creswell *et al.* (2003, p.211) enumerate four key decisions which follow from selecting a mixed methods strategy of inquiry (Table 1.2):

Table 1.2 Decision Choices for Determining a Mixed Methods Strategy
Source: Creswell, 2003, p.211.

Implementation	Priority	Integration	Theoretical Perspective
No Sequence Concurrent	Equal	At data collection	Explicit
Sequential - qualitative first	Qualitative	At data analysis	
		At data interpretation	
Sequential - quantitative first	Quantitative		Implicit
		With some combination	

The choice of research strategy can be understood as theoretically informed in that social inclusion provides the guiding paradigm of interest guiding the design (Creswell, 2003, p.213). The inherently relational nature of social inclusion (section 2.2.3) can be considered as necessitating the exploration of the research objectives from various perspectives. Using a mixed methods approach assists here by building up a more comprehensive picture of the

benefits and challenges of car ownership and use: in quantifiable terms, across a sample based on the British population, and in phenomenological terms, understanding lived experience of transport and inclusion/ exclusion within the urban environment (Flick, 1998; Arksey and Knight 1999).

Accepting that sustainable neighbourhoods are “places where people want to live and will continue to want to live” (ODPM, 2003, p.5) a sequential mixed methods design was determined early in the research process. Implementing quantitative methods, objective 1 would be fulfilled in the first phase, testing hypotheses about the relationship between social inclusion and car ownership using an operationalised conception of inclusion/exclusion in a statistical analysis. The sampling frame generated by the explicit operationalisation of social inclusion in Phase One could be used to extend the quantitative analysis by providing an in-depth understanding of the quantitative results², serving objectives 2 and 3 by either triangulating congruent experiences of inclusion/exclusion implicit in the interviewee accounts from Phase Two, or for theory-building in the case of discrepancies.

The research design is summarised in Figure 1.3 overleaf.

² Although programmed to follow quantitative research for the purposes of this thesis, the research design is potentially iterative and it is intended that the qualitative work will inform future modelling.

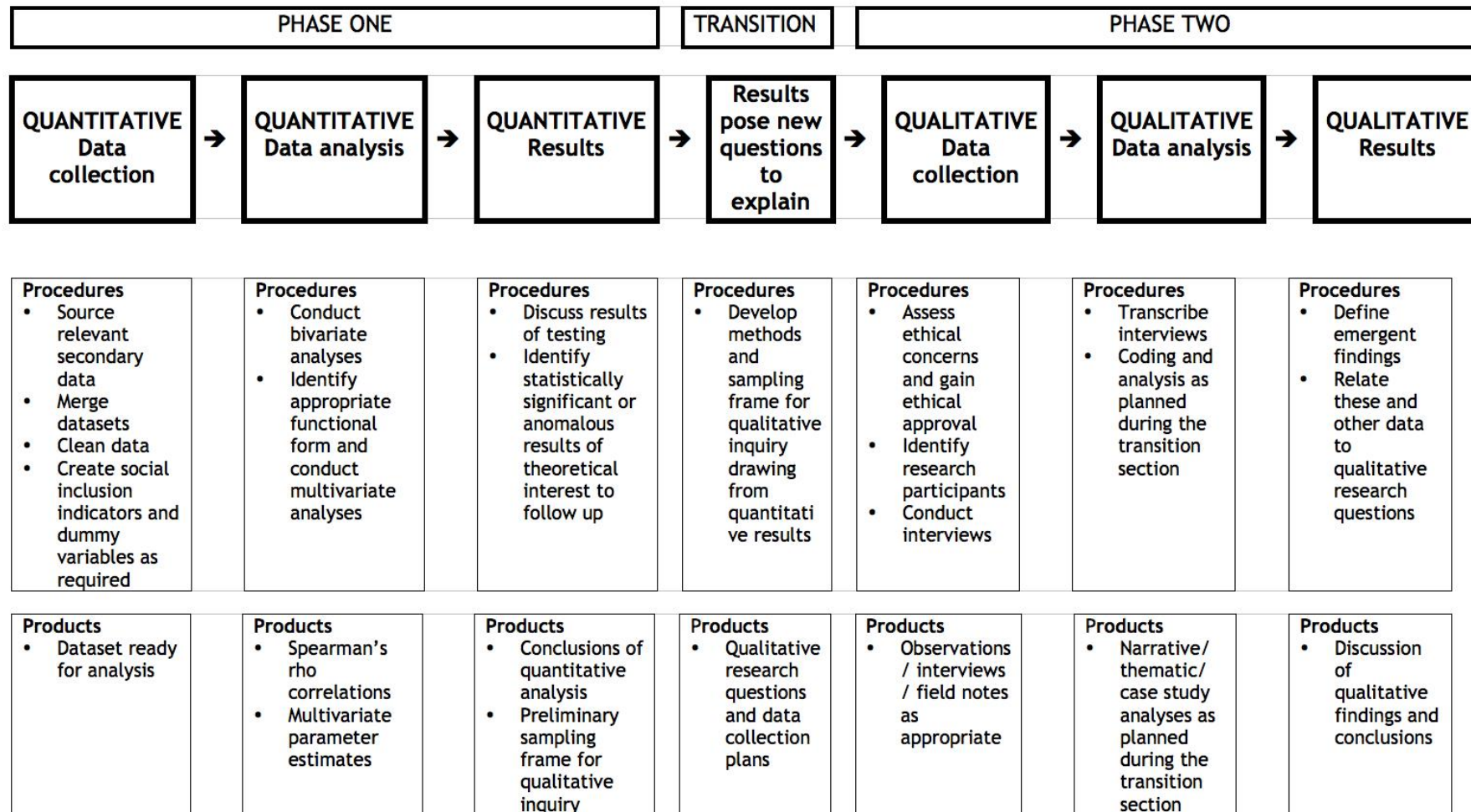


Figure 1.2 Sequential Exploratory Research Design: The Two Data Collection Phases
Source: Developed from in Aldridge *et al.* (1999) cited in Creswell and Plano Clark (2007)

It was anticipated that the quantitative and qualitative phases would carry equal priority and integration would take place at the findings stage; at this stage, the detailed qualitative exploration of the relationships between social inclusion and car ownership and use, contextualised by earlier statistical hypothesis testing, would be used to reflect back on the original research aims.

1.4.2 A Note on Methodological Foundations

The objective of this project, as social research, is to serve a function beyond purely academic ends. As Bloor contends, informing the interested public, policymakers, politicians, providers and users of services, or conducting direct interventions as a consulting professional, can all be considered valid objectives for academic research (1997). Nonetheless, although the pragmatic approach (see 1.8.1) serves for practical purposes, it is unsatisfactory as philosophical grounding.

This work's methodological foundation rests on the adoption of a post-humanist framework of understanding as a means of providing a firmer philosophical foundation than dualist perspectives. Historically, disputes over what might constitute a valid object of study or reliable knowledge have been constrained by a dichotomous humanist context. Research has been informed by polarised perspectives: idealist/interpretivist stances contend that the external world is created by and *only* knowable through the mind and explanations must be offered in terms of meaning rather than causation due to the range of possible perspectives (Flew, 1983; Snape and Spencer, 2003); positivist perspectives argue the dominance of the material, and that brute physical facts persist regardless of human existence (Searle, 1996). The post-humanist perspective overcomes humanistic objections to releasing material agency by arguing for a performative, rather than a representational, epistemology. The material and human activities of research do not reveal an objective reality out

there; they create both the material and conceptual present as they continually intertwine (Pickering, 1995).

1.5 The Structure of the Thesis

Chapter 1 introduces the core problem area, outlining the tensions that the thesis is designed to investigate. The aims and objectives are presented and their relationship with the research methodology and strategy are discussed.

Chapter 2 reviews literature contextualising the issues of social inclusion and urban car ownership and use within both policy and theoretical frameworks. Initially, the challenge of reducing car ownership/use levels is situated alongside concerns about accessibility and social inclusion, and the high expectations that have been placed upon urban densification as a housing strategy. Thereafter, it reviews the dominant theoretical themes upon which the project rests: the chapter provides a conceptual vocabulary for understanding transport, travel and the wider concept of mobility; discusses the compact city hypothesis in relation to the idea of the urban renaissance; and explores the evolution, interpretation and critiques of the social inclusion/ exclusion paradigm.

Chapter 3 established the empirical evidence base for the thesis. It provides a commentary on attempts to operationalise the social inclusion/exclusion paradigm, noting some general implications for research into travel and transport. The idea of mobility as a dimension of inclusion is presented using evidence from investigations of transport exclusion and car dependence and an examination of research centring upon housing and mobility issues related to the compact city hypothesis. Next it reviews the theoretical and empirical literature relating to urban car ownership and use and the core policy areas. The chapter closes by drawing on the outlined theoretical background and evidence base to define the main research

questions, designed to indicate the potential for sustaining social inclusion with reduced car ownership/use in an urban setting.

Chapter 4 introduces descriptive statistics for cross-sectional data from the British Household Panel Survey (BHPS) along with additional spatial data provided by Professor Gwilym Pryce and Experian.

Chapter 5 tests the relative importance of inclusion indicators in relation to car ownership in both bivariate and multivariate analyses, using the data described in chapter 3. The operationalisation of the social inclusion concept develops existing empirical work, synthesising knowledge about the determinants of car ownership and the dynamics of social inclusion in the general population of Great Britain.

Chapter 6 describes the qualitative research process, including application for ethical approval, focusing primarily on the development of qualitative methods suitable to investigate driver-behaviour at neighbourhood level within an urban context. Acknowledging car ownership and use as sensitive topics, the chapter charts the evolution of a research design informed by the quantitative analysis; the sampling protocol was devised to target relatively affluent research participants and a hybrid narrative/semi-structured interview method employed to generate ecologically valid data on a frequently controversial topic.

Chapter 7, the first of two qualitative findings chapters, adopts a case study approach to understand the role of space and urban form in modulating driver behaviour, introducing each of the research neighbourhoods in turn and drawing out contrasts and connections between driver behaviours in each area. The relationship of urban density to car ownership and use is theorised by drawing on the contrasts between the low-density and high-density urban neighbourhoods. The evidence in this chapter indicates different patterns of car *use* as well as car ownership across different urban areas. Car-use for participants in high-density areas

is generally centred around journeys which cannot otherwise be carried out easily, in particular travel involving interchanges; walking as a mode of travel emerged as a theme within the narratives as well as from the semi-structured interviews, and was in some cases explicitly positioned against reduced levels of car use.

Chapter 8 draws on the concept of the car as a competitive mode, dealing with the emergent theme of place. This chapter shifts the focus to the issue of place rather than space to explore *why* the participants have made specific locational choices, and considers the implications that those choices have for transport use. The chapter closes by considering the implications of the gains and losses brought by relative density and accessibility.

Chapter 9 reviews the aims and subsidiary objectives which the thesis set out to achieve and summarises the main findings of both the quantitative and qualitative analyses, in order to evaluate the extent to which the research questions have been fulfilled. The findings are then situated within the broader literature on transport geography and residential choice. An assessment is given of the role of mixed methods and the limitations of the research. Finally, some policy implications from the research are considered before overall conclusions are offered on the relationships between social inclusion and car ownership/use.

2 Social Inclusion and Urban Transport Within the Wider Context

2.1 Introduction

Chapter 1 identified key tensions surrounding urban transport and social inclusion. This chapter reviews literature, placing the issues of social inclusion and urban car ownership and use within wider policy and theoretical contexts. Initially, it offers an overview of the wider policy framework, noting the relevance of the topic to sustainability policies before discussing in turn the three core areas of policy at the intersection of which this research is situated. Primarily, the significance of car ownership/use is defined in terms of the recent trajectory of transport policy in the UK. Following this, the claims of the urban renaissance concept are outlined in relation to transport and mobility. Thirdly, the adoption of social inclusion as a policy objective is briefly reviewed.

Thereafter the chapter reviews the theoretical literature relating to urban car ownership/use and the core policy areas, including social inclusion. Firstly, the research's theoretical background is discussed in terms of key ideas framing the analysis. Initially, this section of the chapter provides a conceptual vocabulary for understanding transport, travel and the wider concept of mobility. Thereafter, the compact city hypothesis is introduced and discussed in relation to the idea of the urban renaissance. Finally, the evolution, interpretation and critiques of the social inclusion/exclusion paradigm are explored from an academic rather than policy perspective.

2.2 The Core Problem Within the Wider Policy Context

Car ownership and use can be seen as situated at the confluence of several major policy streams (Figure 2.1).

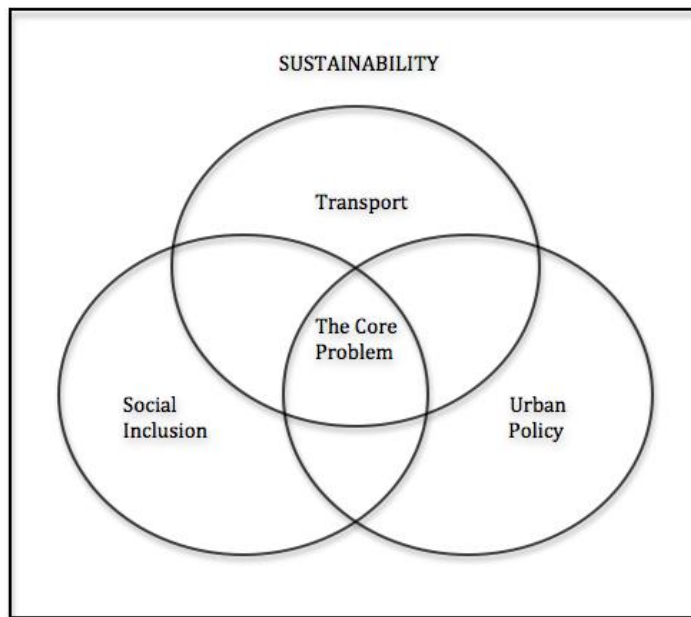


Figure 2.1 The Core Problem within the Wider Policy Context

This section opens by introducing the policy concept of sustainability as an overarching policy theme into which the others feed. Thereafter, the three main sections examine the car's place in the recent trajectory of transport policy, regeneration and the concept of the urban renaissance, and the rapid rise of social inclusion as a policy objective.

2.2.1 Sustainability

Following the *Rio Declaration on Environment and Development*, (UNCED 1992), the concept of sustainable development has become enshrined in policy at both EU and UK levels (CEC, 2001; DEFRA, 2005). Perhaps the

most intuitive understanding of sustainability is its interpretation in terms of resources and energy consumption. Sustainable transport specifically has become an internationally recognised transport objective, with reduced car ownership and use and increased use of public transport considered a key target in achieving this (Banister, 2005). Indeed, with the publication of the Stern Review (2006), awareness of the need to reduce greenhouse gases emissions by cars has a very high profile.

From the world summit on sustainable development in Johannesburg, sustainability has been widely recognised as a tripartite ideal, resting on three intertwined features: environmental, economic and *social* sustainability (Burton and Mitchell, 2006; Girardet, 2006; United Nations, 2002). Of these, sustainability's social facet contextualises this research, linking transport, regeneration and inclusion policies: "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p.43). The United Nations definition of sustainable development requires that it be socially equitable (UN, 2002). Reviewing the now widespread acceptance of sustainability's social aspects within both policy and theory, Burton notes that though issues of social justice as a component of sustainability have attracted approbation, they have received relatively little attention as a research subject (2000a). However, social sustainability is more than a normative ideal: creating a sustainable community necessitates creating a desirable, or minimally *acceptable* environment, or risking constant cyclical regeneration and decay (Lupton, 2003). If the relationship between income and car ownership is as uncomplicated as sometimes portrayed, the objectives of social inclusion, urban regeneration and sustainability could be inherently contradictory: improving living standards and increased prosperity in revitalised cities could be accompanied by rises in car ownership/use, threatening health, wellbeing and social interaction in the urban realm. Equally, if constraining car ownership in favour of more sustainable transport inhibits social inclusion by restricting the ability of

urban dwellers to participate in social or economic activities, rather than an urban renaissance, city living could become a last resort rather than a positive choice.

2.2.2 Transport Policy and the Car

The history of transport policy is shaped by public demand, institutional circumstances and political will. Increased car ownership from the mid-20th century fed demand for unprecedented road building programmes, and political leaders responded (Sloman, 2006; Docherty *et al.*, 2008).

The approach of assessing potential demand from car users then planning construction projects and organising funding accordingly - ‘predict and provide’ - is seen as a hallmark of roads policy during most of the latter half of the 20th century (Parkhurst and Dudley, 2008) and as recently as 1998, Cahill summarised transport policy as “facilitating mobility for motorists” (p.252).

Despite a hiatus in road construction in the 1970s, precipitated by road protests over ‘motorway madness’ on the urban environment and the oil crisis (Docherty *et al.*, 2008), in policy terms, the ‘predict and provide’ approach proved durable. The strategy was epitomised by the Conservative White Paper, *Roads for Prosperity* (DoT, 1989), which supported the logic of attempting to supply capacity for latent demand by explicitly connecting road-building with the economic wellbeing of the nation. However, although in the following decade the association of the Conservative party with pro-car policies was further cemented by Margaret Thatcher’s famous contempt for public transport, the 1994 Royal Commission on Environmental Pollution (RCEP) report provided the pivot-point for a u-turn in transport policy. However, the RCEP identification of car travel as an unsustainable problem (*ibid.*) was not an isolated phenomenon.

Three years earlier, Goodwin *et al.* from the Transport Studies Unit at Oxford University brought the concept of the ‘new realism’ in their report responding to the 1989 National Road Traffic Forecasts for 2025 (1991). At its core, the new realism recognised, regardless of desirability, the *impossibility* of expanding road capacity to meet demand for mobility, and the fundamentally problematic nature of reliance on car use; a suite of travel demand measures, including road pricing, prioritisation of essential traffic and providing attractive alternatives to car travel were necessary (*ibid.*).

Dudley and Richardson acknowledge Goodwin *et al.*’s work as “a pathfinding signal of the momentous shift in the dominant policy discourse which would take place in the 90s” (2001, p147). However, they also cite the European Community’s nascent role in roads policy through the requirement for environmental impact assessments and the development of anti-roads groups in the UK, stimulated by controversial road projects such as Twyford Down. On a parallel track, Docherty (2003) drew a trajectory supporting the formulation of a sustainable transport paradigm from the Brundtland Report, through the 1989 European Conference of Ministers of Transport, to the UN Earth Summit in 1992; within this context, the RCEP report restated the need for fundamental change in UK transport policy (1994, pp. 8-10).

Presaged by the new realism, that change led away from the car: the report included eight policy objectives, centring around reducing the environmental externalities of transport and, specifically, minimising the *need* to travel, through land-use policies, promoting modal shift to less environmentally damaging forms of travel, and reducing car dominance in urban areas (RCEP, 1994). The same year, a second government-commissioned committee, the Standing Advisory Committee on Trunk Road Assessment (SACTRA), also brought out a report confirming the new realism’s logic; SACTRA’s findings established that ‘predict and provide’

would inevitably fail, even aside from the relatively straitened economic circumstances of the mid-1990s (Docherty, 2003; SACTRA, 1994). The SACTRA report confirmed what had hitherto been known as “the M25 effect” (Walton, 2003, p.81): that the level of road capacity is related to, not independent of, the level of traffic; hence increased available road space can actually generate more traffic (“induced traffic”) rather than satisfy demand (SACTRA, 1994). Sloman analyses the genesis of the car’s becoming “so intrinsic to the way we work, shop and spend our leisure time” from the opening of the first stretch of the M1 motorway in 1959, and on through the development of out-of-town supermarkets, retail parks and regional shopping centres with entertainment facilities along the North American model (2006, pp.10-11).

The policy response to the RCEP and SACTRA reports of 1994 was rapid (Docherty, 2003). The recognition of pollution as a serious health problem, alongside the challenge of the new realism, moved transport policy beyond accommodating the car towards encouraging more benign modes of travel (Cahill, 1998) and within two years the Department of Transport published strategy documents promoting both walking and cycling (DoT, 1996a, DoT, 1996b). However, simultaneously, the Labour Party presented a far more bullish and broad-ranging pre-general-election transport policy statement, with *Consensus for Change: Labour’s transport strategy for the 21st Century* (1996). Capitalising on the momentum towards finding sustainable transport solutions, this document promised a comprehensive review of existing plans for the road network.

As the party of government from 1997, New Labour followed through on their transport plans by appointing Phil Goodwin as chair of an expert panel advising on policy; in 1998 the White Paper *A New Deal for Transport: Better for everyone* was published by the Department of the Environment, Transport and the Regions (DETR). In this document, managing, rather than accommodating, mobility became the central theme; additional to

reviewing the previous government's agenda for trunk road development, the basis of transport project appraisals and the priority accorded to different modes was questioned.

However, as well as rearticulating transport priorities, New Labour also oversaw extensive changes in the governance of transport planning and delivery. Although prior to devolution, *A New Deal for Transport* (*ibid.*) was accompanied by parallel documents from the Scottish and Welsh Offices: *Travel Choices for Scotland: The Scottish Integrated Transport White Paper* and *Transporting Wales Into the Future* (Scottish Office, 1998; Welsh Office, 1998). Anticipating potential post-devolution policy divergence between the constituent parts of the UK, MacKinnon and Vigar note that the Scottish Office document uses stronger language with regard to private transport, specifically condemning excessive and inappropriate car use (2008, p.33). They track the rescaling of transport governance at both national and sub-national levels. Nationally, through 1999 and 2000, certain “domestic” responsibilities for transport were devolved to Scotland, Wales and Northern Ireland; powers considered “closely linked with the UK economy and the common market” remained reserved to the Westminster government (*ibid.*, p32)³. Sub-nationally, new bodies at both regional and local levels have been created to oversee transport strategy (see Table 2.1).

The early years of the Blair government provided policy direction and a new institutional framework, seemingly according with the wider European framework set out in *European Transport Policy for 2010: Time to Decide*, which called for more efficient use of the transport system in order to decouple growth in road transport from economic growth (EC, 2001).

³ From the inception of the Greater London Authority in 2000, London (through Transport for London), was awarded devolved powers, and has attained considerable policy integration between buses, roads, taxis and river traffic (Knowles and White, 2003; MacKinnon and Vigar, 2008).

Table 2.1 Post-Devolution Transport Policy Structures in England and Scotland
Source: MacKinnon and Vigar (2008) pp. 38 & 41

	Scale	Transport (institution)	Transport (strategy)
England	<i>Regional</i>	<ul style="list-style-type: none"> Regional Assemblies Some 'meta-regional' activity 	<ul style="list-style-type: none"> Regional Spatial Strategy (incorporating a regional transport strategy)
	<i>National</i>	<ul style="list-style-type: none"> Passenger transport authorities/ executives exist in 6 'city-regions' Mostly unitary districts; some areas have two-tier county and district councils 	<ul style="list-style-type: none"> Local Transport Plans (prepared individually or between local authorities)
Scotland	<i>Regional / City-Regional</i>	<ul style="list-style-type: none"> 7 Regional Transport Partnerships cover the entire territory City-region committees in 4 areas 	<ul style="list-style-type: none"> Regional Transport Strategy Strategic Development Plans (in 4 city-regions)
	<i>National</i>	<ul style="list-style-type: none"> 32 local authorities 	<ul style="list-style-type: none"> Development Plans/ Local Transport Strategies

However, subsequent policy has been heavily criticised for failing to fulfill this early promise. Just two years after the 1998 White Paper, the Westminster government published *Transport 2010: The 10 Year Plan* (DETR, 2000a), which included a focus on integrating different modes, making public transport more attractive as journey times reduced and interchanges became more convenient. However, contrary to the rhetoric of sustainable transport, which emphasized a reduction in car use, the plan anticipated continuing growth in levels of traffic and scheduled a reinstatement of road-building plans at levels similar to those planned by the earlier Conservative administration; sustainability had quickly been reduced to 'pragmatic multimodalism' (Shaw and Walton, 2001). Sloman's critique of the plan - specifically, to reduce congestion in major cities by 8% whilst traffic grows by 10% - is based on the focus on congestion as a "small and relatively unimportant symptom" of the underlying problem of

the raft of negative effects caused by car use (2006, p.141). In Scotland, although the National Transport Strategy (SE 2006) and the co-ordination between spatial planning and transport outlined in the *National Planning Framework* (SG 2008) have been better received, *Scotland's Transport Future* (SE 2004) was criticised as being vague and without prioritisation, and 'objective fatigue' has been a further concern, given the high turnover of ministers with responsibility for transport (Docherty *et al.*, 2007; MacKinnon and Vigar, 2008).

The optimism of the early Blair years notwithstanding, the ambition of managing demand for car travel was always going to be politically and institutionally problematic.

Despite post-devolution restructuring, the 'predict and provide' era has still left an institutional legacy. This is twofold, impacting on the perspective and the methods of those employed to design and execute transport policy. Sloman contends that many, perhaps most, senior council staff trained as civil engineers and, as such, their default response to the problem involves the physical environment and building (2006). Furthermore, cost benefit analysis has historically been pivotal in the decision-making process for transport investment, which tends to favour projects which will achieve small savings in travel time for large numbers of people and, consequently, advancing road building projects over investment in public transport services or infrastructure to support walking and cycling (Lucas, 2004).

However, the political difficulties of reducing demand for car ownership and use are more overtly challenging - although the Transport Acts of 2001 include powers to raise congestion charges, witness the facts that, firstly, the initiative and implementation of those powers have been devolved (or abdicated) to local authorities; secondly, only London, under the leadership of a forceful new mayor, has successfully exercised those

powers⁴. Later attempts in Manchester and Edinburgh have failed; characteristically of a commons problem, the issue of democratic consent to introducing new charges has proved problematic. As Downs has stated, writing from the US: “traffic congestion has almost surpassed bad weather as a malady that is universally discussed but rarely improved through public policy”(2004, p.vii).

Although the government’s own Commission for Integrated Transport (CfIT) recommended a policy of direct charges for using the road network, reluctance to take leadership from the national levels can be attributed to a justifiable fear that being perceived as anti-car will undermine electoral support (Cahill, 1998; CfIT, 2002; Sloman, 2006). Goodwin *et al.* cite a well-known RAC Foundation for Motoring and the Environment survey where 69% of households with a car agree that it is essential to their lives and that they would not want to be without one (1995). The fuel price escalator (‘petrol tax’) was originally introduced by the Conservative government in 1993. The New Labour government introduced a higher rate of annual increase, adding 6% per year to the value of petrol tax. Although the policy was abandoned after the rise in 1999, it is still credited with precipitating a crisis in 2000, as oil depots, motorway links and city centres were blockaded by hauliers and farmers protesting the relatively high cost of fuel in the UK (McKinnon, 2003)⁵.

The resulting ‘ecological modernist’ policy approach emphasises areas of joint interest between economic prosperity and sustainable transport, alongside soft measures as the main policy instruments to manage demand for car ownership and use. From the European perspective since the road charging directive, charging schemes should be designed to reflect the cost

⁴ Gaunt *et al.* (2007) identify strong political commitment and confidence in the decision-makers as key ingredients of a successful bid to introduce a congestion charging scheme.

⁵ At this point, UK fuel duty was 52p per litre against the EU average of 23.4p (McKinnon, 2003, p.149).

of externalities, as well as any additional role financing infrastructure or optimising traffic levels; the EU have recently published a study commissioned on internalisation measures and policy for the external cost of transport (IMPACT) (EC, 2006; CE Delft, 2008). However, the DfT remain circumspect on the topic of road pricing:

“It would be unwise to rule out national road pricing in the long term, but there are real practical issues which need to be overcome - such as technology challenges and personal privacy... it is unrealistic to think of taking decisions in the next 5-6 years on whether or not to proceed with a national road pricing scheme.” (DfT, 2008a, webpage)

Indeed, Parkhurst and Dudley emphasise that the *Stern Review of the Economics of Climate Change* (Stern, 2006) and the *Eddington Review on Transport, Productivity and Competitiveness* (Eddington, 2006), two major policy reviews relevant to the goal of sustainable travel, were inspired by the Treasury rather than the DoT (2008). Eddington’s report⁶ recommends that the transport sector should meet its full environmental costs, particularly noting congestion pricing on the roads; the analysis also determines that the UK already has a high level of connectivity and that the strategic priority should be alleviating congestion and unreliability in congested urban areas (*ibid.*, 2006).

In the wake of Stern and Eddington, the DfT produced *Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World*, endorsing a strategic approach focused on congested parts of the network, alongside targeted road development (2007). The following year, the main report, *Delivering a Sustainable Transport System* (DfT, 2008c), outlined the government’s action plan, specifying five goals for transport. However, particularly striking is the document’s introduction, by the then Secretary of State for Transport: in a series of non-sequiturs, he

⁶ Although the report analyses the transport implications for the whole of the UK, due to the devolution of transport powers the recommendations apply only to England.

equates tackling climate change in an “economically efficient manner” with “preserving freedom of choice” and “facing people with the true carbon costs of those choices” whilst simultaneously “not rationing transport demand by constraining the capacity of our transport networks” (Hoon, p.5 in DfT, 2008c). Notably, the “sophisticated policy mix” prescribed by Eddington is not to include road pricing: demand management through congestion charging is left firmly in the hands of local authorities; and otherwise, toll lanes or other road pricing options may be practicable options “for the future”, pending new technologies and monitoring international experience (DfT, 2008c, p.21).

For the foreseeable future then, travel demand management will foreground carrot rather than stick; what Cahill has dismissively characterised as generally unsuccessful “low budget attempts to change the travel behaviour of the British public”(1998, p.254). The current suite of DfT measures rests a great deal on an information-and-exhortation approach, highlighting travel awareness campaigns and European Mobility Week. Appendix C of the DETR publication *Encouraging Walking: Advice to Local Authorities* (2000) includes a range of ideas, including integrating walking into transport and land use planning. However, travel demand management (TDM) measures are delivered as bullet points which the Local Authority might administer, rather than significant and potentially controversial policy undertakings e.g. “minimise the need to travel” or the suggestion that “congestion charging and the workplace parking levy” be used to fund improved walking facilities (pp.33-34).

Nevertheless, the local perspective fostered by the Travel Plan guidelines accords with the wider concept of sustainability and the potential of supporting schools and employers that want to encourage more active travel might easily be underestimated (see 2.3.2). These soft measures, amongst others, have been rebranded among a package of “smarter

choices”, designed to encourage more sustainable travel behaviour. A summary of the strategies studied is shown in Box 2.1.

Box 2.1 Smarter Choices

Source: Cairns *et al.* (2004)

- Travel Planning: workplace; school; personalised
- Public transport information and marketing; travel awareness campaigns
- Car clubs and car sharing schemes
- Virtual communication: teleworking; teleconferencing; home shopping

The *smarter choices* policy strand is based on two volumes of work from a group of academics conducting research for the DfT on “the influence of soft factor interventions on travel demand.” Cairns *et al.* defined their remit as investigating policy measures which “seek to give better information and opportunities which affect the free choices made by individuals, mostly by attractive, relatively uncontroversial, and relatively cheap improvements” (Cairns *et al.*, 2004, p. v). Sloman maintains a derisory stance on “cajoling people out of their cars” and settling for reductions in the *growth*, rather than *reduction*, of car use (2006, pp.12-13). Furthermore, a prerequisite for the success of this approach to reducing car use is the existence of alternatives to car transport; both infrastructure capacity and the acceptability of these alternatives are concerns (Stradling, 2006). Nevertheless, bringing the extensive research experience of the *smarter choices* researchers to bear can be seen as a long overdue response to on the challenge of managing demand for car travel; hitherto, the needs of the many people who either do not want to or cannot travel by car have been unrecognized or neglected (Stradling *et al.*, 2000). The *smarter choices* research has finally brought soft measures into the transport policy mainstream (Anable *et al.*, 2004; Cairns *et al.*, 2004).

Transport Policy - Summary

Over recent decades, growing environmental awareness and understanding of the phenomenon of induced traffic have precipitated a radical shift in policy objectives regarding car use. 'Predict and provide' has given way to ambitions for building a sustainable transport network. Devolution and the restructuring of transport governance at regional level have demonstrated potential for generating new solutions to the problem of demand for mobility; alongside these developments has come a recognition that transport policy must address the full range of modes. However, although it has been recognised for some time that continuing to increase road capacity is not a sustainable option, the political will to engage with potentially unpopular travel demand management measures, particularly regarding the car, is questionable and the historical focus of transport planning on private transport is proving difficult to challenge. Although the language of policy supports Eddington's analysis that the UK already has a well-developed transport network there is, as yet, no indication that there will be any centralised initiative to set "prices to reflect both the congestion and environmental costs of travel" (Eddington, 2006, p.39). Outside of London the *practice* of travel demand management rests with *smarter choices* alone; the charge that modal integration is replacing sustainability as the main policy aim seems valid.

2.2.3 The Urban Renaissance and the Promise of Density

In recent decades two normative shifts have influenced the trajectory of regeneration policy. Firstly, Lees notes that even the change in nomenclature, from renewal to regeneration to renaissance, marks a shift in understanding of the aims of public policy; a more holistic approach, supporting employment, social interaction and access to amenities has been developed (2003). Erling and Norland characterise the post-Brundtland era as heralding a new optimism in planning, as attention has

focused on promoting sustainable development (2005). The current phase in the evolution of urban regeneration policy has been characterised as introducing the broader idea of environmental sustainability within “the simultaneous adaptation of the physical fabric, social structures, economic base and environmental condition of the urban area” (Roberts, 2000, p.18). In accord with this perspective, the Blair government’s *Neighbourhood Renewal* programme was explicit about the need to address problems at deeper levels than that of building renewal (SEU, 2001).

In parallel, rather than merely bringing unacceptable areas up to a minimum standard, a positive urban vision now informs regeneration. Drawing on urban theory and research traditions which contend that the design of space is an important factor influencing social interactions, policy stresses both revitalisation and repopulation of urban areas, making them places where people *choose* to live (Jacobs, 1961; Schoon, 2001). The management of residential density is a long-established planning tool, although over recent decades the dynamic has shifted from one of reducing to increasing residential densities (see DETR, 1998a for an overview). This *New Urbanism* - the Urban Renaissance agenda in the UK - can in effect be understood as a policy manifestation of Jacobs’ analysis, which linked dense, mixed-use urban forms to social interaction, safety and a sense of vitality (Jabareen, 2006; Jacobs, 1961). In accord with New Urbanist theory and the allied phenomenon of transit-orientated development, density management is increasingly expected to advance a range of related policy objectives (Krizek, 2003; Brown *et al.*, 2001). Following *Towards An Urban Renaissance*, the report of the Urban Task Force, headed by Lord Rogers of Riverside, urban densification has been enthusiastically adopted into the UK policy mainstream as a strategy for regeneration, boosting urban economic and social vitality, supporting environmental sustainability and, perhaps most ambitiously, fostering community cohesion (DETR, 1999; DETR, 2000b; ODPM, 2003; UTF, 2005).

With regard to car ownership and use, the Urban Task force specifically contended that higher density would contribute to urban sustainability by reducing the need for cars, since there would be more transport links and public amenities within walking distance (DETR 2000b; UTF, 2005)⁷. The concept of greater urban density as a positive attribute has become ubiquitous in sustainability discourse. New developments and expanded growth areas are to be of “*sufficient size, scale and density*, and the right layout to support basic amenities in the neighbourhood and minimize use of resources (*including land*)” (ODPM, 2003, p.5, emphasis added). Demographic change and the trend towards single-person households have combined with concern over housing supply to reinforce this perspective (Barker, 2004; Bennet and Dixon, 2006). However, although some research evidence supports claims made by advocates of urban compaction, both before and after the raft of initiatives surrounding the Urban Task Force’s report, there has been criticism that political acceptance of the idea that high-density, mixed use urban development is inherently more sustainable has outpaced the evidence base (Breheny, 1996; Burton, 2003; Dieleman *et al.* 2002). Nonetheless, regarding sustainability and the car, although the implications for energy use and emissions remain open to debate (Breheny, 1996; Urry, 2008), general consensus exists that large settlement size, combined with high population density, reduces levels of car ownership and distances travelled (Romilly, 1999; Boarnet and Crane, 2001; Stradling, 2005).

Related to the holistic approach to regeneration and the positive vision signalled by the urban renaissance, the healthy living agenda provides further impetus for considering the compatibility of social inclusion with reduced car ownership and use. Following from research linking poverty

⁷ Professor Sir Peter Hall wrote a dissenting opinion in the Final Report, disputing the case for raising minimum densities, expressing concern that tighter planning and building regulations might have the unintended consequences of inhibiting housing completions, placing further stress on affordability and causing an “unprecedented increase in apartment construction, unsuitable for families with children and undesired by potential residents” (UTF, 2005, p.19).

and health inequalities, there has been increasing political concern about rising levels of obesity, including intergenerational health inequalities between neighbourhoods as well the concept of community health (Acheson, 1998; SE, 1999). Policies aimed at travel demand management have an overlap with the healthy living agenda. Initiatives such as *Improving Health in Scotland: The Challenge* and *Choosing Activity: A physical activity action plan* acknowledge the links between rising levels of obesity and transport choices (SE, 2003; Department of Health, 2005). A growing body of research indicating the physical and mental health benefits of active travel is now feeding into the planning and regeneration mainstreams (Dimeo *et al.* 2001; Ekelund *et al.* 2007; Thommen-Dombois *et al.*, 2007).

Explicit recognition of the role of transport in urban sustainability is visible in new policy initiatives to increase housing growth, building three million new homes by 2020. Issued the same year as *Homes for the Future: More affordable, more sustainable* (DCLG, 2007), the *Manual for Streets* includes guidance for the design of residential streets considering pedestrians and cyclists and proposes a design hierarchy favouring users of smarter choices (DfT/DCLG, 2007). Most recently, *Building Sustainable Transport Into New Developments* provides further evidence of cross-departmental awareness of the implications of design for mobility (DfT/ DCLG, 2007; DfT, 2008c).

2.2.4 Policy and Social Inclusion

The social inclusion/ exclusion concept is among the most powerful forces in contemporary policy, and has provoked a burgeoning of literature which Sen has described as “not for the abstemious” (2000, p.2). In the UK, New Labour enthusiastically adopted social exclusion as a means of conceptualising a range of social problems within months of the 1997 general election; writing in 2000, Levitas observed that, although the term “social exclusion” had been current in policy circles for nearly two

decades, it had become a central feature of British political discourse only within the preceding two years (2000). Latterly a Sub-Committee within the Ministerial Committee on Life Changes, the Social Exclusion Taskforce (SETF), like its precursor, the Social Exclusion Unit (SEU) was originally based within the Cabinet Office. The SETF's remit is to work at cross-departmental level, defining priorities and identifying potential solutions to "extend opportunity to the least advantaged so that they can enjoy more of the choices, chances and power that the rest of society takes for granted" (CO, 2006, p.3). Nonetheless, policy definitions of exclusion have not always been particularly illuminating (Box 2.2):

Box 2.2 Social Exclusion - Policy Definitions

Social Exclusion: Policy Definitions

Social exclusion is a shorthand term for what can happen when people or areas suffer from a combination of linked problems such as unemployment, poor skills, low incomes, poor housing, high crime environments, bad health and family breakdown. (Social Exclusion Unit, 1997)

Where individuals or a group are not able to participate fully in society because of unemployment, low skills, poverty, bad health, poor housing or other factors. Social inclusion is about removing barriers and factors which lead to exclusion so people can participate. (Scottish Executive, 2001)

The definitions above also highlight some divergence in that Westminster policy has tended to focus specifically on exclusion, whilst the emphasis north of the border has been rhetorically at least, more on promoting inclusion than eradicating exclusion (Sinclair and Sinclair, 2001). In terms of political trends, policy definitions of social exclusion identify links and imply a dynamic relationship between various policy challenges e.g. unemployment can lead to low income, be a result of poor skills, and so on. Notably, where poverty is mentioned within a social exclusion framework, it is listed as one of a *number* of problems.

Echoing the developments in housing and sustainable transport policies outlined in section 1.5, looking through the lens of social inclusion has facilitated a paradigm shift in policy-making: issues hitherto seen as problems for the individual or as specifically transport problems are now being conceptualised as part of the wider regeneration/ sustainability agenda.

Historically, in transport planning, the dominant accessibility evaluation perspective has identified travel with *vehicle* travel, assuming increasing mobility as measured in time and distance is the priority (Litman, 2003; Marshall, 2005). However, Litman provides an analysis of physical accessibility as the primary goal of transportation, where mobility is a subset of accessibility, complemented by land use, transport system connectivity and virtual mobility (2005).

This growing interest in accessibility - the *ability* to reach social and economic opportunities - is slowly shifting traditional transport planning perspectives. Along with this has come recognition of the pivotal role of *place* in accessibility. Recalling the competitive relationship between the car and other modes, access and inclusion must be seen as fundamentally intertwined. Hine and Grieco's clusters are rooted in urban design as much as connectivity, in that some urban forms are less adaptable to multi-modal access than others (2003).

Drawing from the findings of the Social Exclusion Unit report on transport and social exclusion, *Making the Connections*, accessibility planning has become a fundamental of local transport planning (2003). Furthermore, links between transport planning and the wider policy field have been more overtly recognised. The connection between accessibility and a range of inclusionary factors (neighbourhood renewal, sustainability, access to healthcare, employment, education) is explicit in the Department for Transport's *Accessibility Planning Guidance* and Scotland's National

Transport Strategy (DfT, 2006c; SE, 2006). Relating this more specifically to car use, planning guidance has now been issued on maximum parking standards, with a view to changing the overall travel context to better favour those without access to personal transport, considering both social inclusion and neighbourhood permeability (SPP17, 2005).

2.3 Summary - The Policy Context

Considering the income-ownership orthodoxy alongside the inclusion/exclusion paradox within the current policy context re-emphasises the importance of the research area and underscores the impetus for extending knowledge about the relationships between social inclusion and car ownership/use. The association of car use with income, combined with the powerful benefits and externalities that private transport entails, establishes social inclusion and the car as a significant problem area. In analytical terms, this can be defined as a “commons problem”, insofar as personal interest (maximising mobility) undermines common interests (minimising the disbenefits from car ownership/use) (Stone, 2002). The urban focus of the thesis is a product of that problem’s spatial dimension. Social inclusion is of dual concern here: firstly, in that an individual’s ability to participate in society might be compromised by lack of access to private car transport; and secondly, those causing the externalities through their car use are not necessarily subject to their actions’ consequences. As Stone notes, “commons problems are also called collective action problems because it is hard to motivate people to undertake private costs or forgo private benefits for the collective good” (*ibid.*, p.23). The next section will therefore situate the core problem within the policy fields with scope to influence choices relevant to divorcing increasing income from increasing car ownership/use.

2.4 Conceptualising Transport, Travel and Mobility

Having identified the relationship of social inclusion to that of car ownership/use as a problem area where there is a strong policy imperative for research, the theoretical background to any potential research must be explored. This exploration is necessary to underpin the feasibility of the project and to situate any proposed research within the academic tradition. The dominant theoretical themes underpinning the project are understandings of transport and mobility, the compact city hypothesis, and that of social inclusion itself. Exploration of the latter includes a particular focus on critiques of the concept, since they are relevant to its operationalisation. The second part of this chapter examines the context of the core problem in terms of theoretical literature in order to situate the research within the academic tradition.

2.4.1 *Transport Geography: Conceptual Tools*

Rodrigue *et al.* define the role of transport geography as seeking “to link spatial constraints and attributes with the origin, destination, the extent, the nature and the purpose of movement” (2006, p.5); the conceptual tools they identify in support of this endeavour are the three core elements in transport geography: transportation nodes, transportation networks and transportation demand. The nodes are the locations from which movements start and finish, or intermediate points of transfer on that journey. The network is the linkages derived from the transport infrastructure comprising everything from rail track, motorway or an underground system to cycle and footpaths. Demand for movement, that is, use of the network linking nodes, is understood as being based on the various socio-economic activities with which people engage (*ibid.* pp.6-7). Travel is therefore understood as a *derived* demand in that, rather than being “something undertaken for its own good” (Hanson, 2004, p.4), the demand for *other* activities generates demand for transport (see Table 2.1).

Table 2.2: Trip Purpose and Movement
Adapted from Daniels and Warnes (1980) and Rodrigue *et al.* (2006)

Purpose	Activity	Type of Movement	Scheduling
Economic	Earning a living/ acquiring goods and services	Pendular/ professional/ personal	Obligatory
Social	Forming/ developing/ maintaining social relationships	Personal	Voluntary
Educational	Travel to schools/ colleges/ evening classes	Pendular	Obligatory
Recreational	Travel to entertainment or recreation/ Travel during recreation (walks, rides etc)	Personal	Voluntary
Cultural	Travel to places of worship/ cultural/ political meetings	Pendular	Obligatory

2.4.2 Trip Type and Urban Environments

Additional to Daniels and Warnes' (1980) analysis of trip purpose and activity type, Table 2.1 incorporates implications for movement type and scheduling based on trip purpose. Rodrigue *et al.* (2006) define urban movements along axes with implications for both recurrence and timing. Pendular movements tend to be highly cyclical and hence are regular and predictable, often occurring daily. Professional movements are linked to work-based activities, generally taking place during normal working hours. Personal movements are linked to both economic and social trip purposes in that they can include shopping as well as making and maintaining social connections. Trips can also be analysed as either obligatory or voluntary, depending upon whether or not the scheduling is determined by the traveller, or the organisers of the activity (*ibid.* p.190).

As well as reviewing the vocabulary of transport geography, the preceding typology underlines the complexities of urban movements and the double-edged nature of geographic concentration.

With regard to complexity, the typology of trip purpose and movement above demonstrates that the nature of the trip might itself engender further travel. Economic trips might include professional work-based activities involving travel beyond regular trips to and from the main workplace. Similarly, recreational trips might include further travel at the destination location - most typically active travel such as walking, riding or cycling or trips by boat or coach. Within the framework of the city, Rodrigue *et al.* might classify these additional recreational trips as “touristic”, in that they involve interactions between landmarks and amenities and are particularly important for cities (*ibid.* p.190). However, the agglomeration of leisure opportunities is also attractive to urban residents as well as visitors to the city, generating additional local trips.

Furthermore, beyond the nature of the movement generated by individual trip purpose, the issue of trip chaining - combining different trip purposes in an extended journey - has implications for urban travel. Given that demand for travel is generated by the relative location of nodes, destination start, end and interchange points are more closely clustered together in urban areas due to their greater density, thus reducing the need for travel. The timing of combining trip purposes into one journey will likely be determined by economic and education trips, given the obligatory character of their scheduling. However, the nature of the transport network is an intervening factor on two counts.

Firstly, the network/ demand relationship is characterised by flows of traffic. Within an urban context, the pendular and obligatory nature of many economic and educationally motivated trips leads to increased flows at the beginning and end of the business day, pressurising the network as people move to and from the most central nodes, resulting in traffic congestion. Distance travelled may be reduced, but the cost in time taken might seem high in that it can therefore take relatively longer to cover relatively short distances in urban areas. Secondly, although proximity to a

central node can mean increased modal choice in that terminal points for road, rail and bus services will coincide there, the links between different nodes are structured as radials rather than circumferentially.

In combination, the slowing of journey times near a central node and the predominantly radial structure of the transport network make modes which can accommodate circumference routes more attractive, particularly with the exigencies of multiple trip purposes involving destination points at more than one node. This is particularly a challenge for working parents managing childcare - a facet of trip purpose only obliquely present in the Daniels and Warnes typology.

2.4.3 Urban Form and the Travel Time Budget

As suggested above, the trip purpose typology also provides an introduction to the ways in which transport and location are intimately intertwined. Changes in transport technology have been crucial in influencing the size and form of the city, allowing greater distances to be travelled in shorter times. The average amount of time spent travelling, the *travel time budget*, has stayed at just over one hour per person per day over recent decades; this average figure is claimed to be constant globally, in both high and low mobility settings (Lyons and Urry, 2005; Rodrigue *et al.*, 2006). Considering the relative speeds of walking, cycling, (literally) horse-power, train and motorized travel, this has had implications for the scale of the city, particularly for how far residential and work locations can be separated geographically. The transition from walking, through early forms of powered transport to the car as the primary means of travel, has been analysed as fundamentally influencing the city's character both within Western Europe and the United States (Schaeffer and Sclar 1975; Muller, 2004; Docherty *et al.*, 2008). Muller distinguishes the recreational automobile era (before 1945 in the U.S.) from the contemporary "freeway" era (2004, p.75). Prior to 1945, it was changes in transport technology which were the key factor shaping

urban form; thenceforth, the dynamic altered with the “coming of age of automobile culture” meaning that the resulting urban deconcentration rendered the car a necessity (*ibid.*). Downs identifies low residential density as the primary factor undermining US public transport viability (2004). From a more European perspective, Docherty *et al.* (2008) note the impact of mass car ownership in Europe in the 1950s and 60s where, even in older European cities, additional road-building encircled and branched off from traditional radial routes, allowing more complex travel patterns.

These changes reflect more than increased modal options. European cities evolved when scale was largely a product of walking distance, resulting in their characteristic small size and relative density. Later, the fixed routes of horse-drawn trams and the railways effectively reinforced the city centre’s importance, as important nodes clustered around the accessible central district. Docherty *et al.* emphasize the resulting social implications: “One of the main innovations of the growing public transport of this era was therefore the social integration achieved by opening up the wide variety of city services and activities to a broader social spectrum” (2008, p.87). Conversely, increased car ownership permitted a diffusion of activities, allowing the segregation of residential, social and economic functions as modal choice determined the potential radius of movement between locations within the time travel budget.

Indeed, even early attempts to theorize the spatial patterning of urban land use have recognised transport and mobility as important factors. Burgess’ influential concentric ring model conceptualises distance from a central business district as a determining factor in the desirability of locations for different socio-economic functions (Rodrigue *et al.*, 2006). Later modifications, such as Hoyt’s sectoral model, recognise more explicitly the influence of transport on land use, identifying rail and road communication axes as giving direction to urban growth along radial transport axes (Bruegmann, 2006).

2.4.4 Conceptualising The Car as Distinctive Within the Modal Mix

From a transport research perspective, “transport” can be considered to cover *all* means of travel: as well as bus, train or car, modal split at the urban scale might incorporate cycling, taxis, travelling in a car as a passenger and crucially, walking. However, transport geography’s academic roots rest with the disciplines of engineering and economics (MacKinnon and Vigar, 2008). Perhaps because of this, research has tended to focus on infrastructure and rational choice, emphasizing motorized transport, particularly the car. In reviewing the research literature considering factors influencing modal choice, Black (2003) lists “automobile availability” as a key variable distinguishing that mode from all others (Box 2.1).

Box 2.3: Review of Key Variables Influencing Modal Choice
Source: Black, 2003, pp.188-9

- Travel time
- Travel cost
- Convenience
- Comfort
- Trip purpose
- Automobile availability
- Reliability

However, both the existence and the content of a body of theoretical literature considering the relationship between people and their cars distinguish the car from other modes. That affective factors influence modal choice provides an access point to the literature on the intimacy and intensity of our relationship with the car. Here, *Actor-Network Theory*, originated, modified and disavowed by Bruno Latour, continues to be influential through the concept of the hybrid: technology as a part of or

extension of the human. Not only a tool, the machine effectively has an intrinsic form of agency, by changing what the nature of “personhood” (Latour, 1987; Haraway, 1991; Dant, 2004) Cars provide more than the mechanics of movement from A to B: both physically and symbolically, they are part of who we are. More recently, Urry has conceptualised ‘automobility’, characterised as capturing “the humanist self as in the notion of autobiography, and of objects or machines that possess a capacity for movement, as in automatic and automaton” (2000; 2004, p.26). However, Urry’s analysis exceeds the human/ machine hybrid idea to realise the implications of that concept in what he defines as a system or culture of automobility: intersecting fields of environmental, social, economic and cultural consequences based on the privileging of personal mobility. In this understanding, the car is no longer simply an object, nor even a *hybrid* part-human object; more than any other mode of transport, it has dominated how car users and non-car users alike experience and manage space and time (Urry, 1999, pp.7-8).

Gartman develops one such dimension, the car in a wider consumerist culture, analysing its changing *meaning* as personal item which has developed with its circumstances of production and use (2004). Drawing on sociological theories of consumption from Bourdieu, the Frankfurt School and post-modernist analysts, he theorises three “ages of the automobile.” The first age, that of “class distinction”, draws on an understanding of consumption as a matter of status or cultural capital; on its initial appearance, the car connoted class privilege and was “more often used not for practical transport but for leisure and public ostentation” (*ibid.*, p.171). Contrastingly, the early mass-produced cars were mundane by comparison in terms of both aesthetics and engineering. Gartman analyses the differences between high-end and mass-produced cars as both symbolising and legitimating class and gender inequalities, characterising the second age in the 1940s and 50s as that of “mass individuality”. In this period, the level of qualitative difference between the upmarket and

downmarket diminished and mass-produced cars' appearance began to mimic that of luxury vehicles; price grades were determined increasingly by "aesthetics and accessories" targeting different income groups (*ibid.*, p.177). The third age of "subcultural difference" from the 1960s onward produced a diversity of vehicle types targeting not, as previously, an income group but specific niches, by age, gender and family status, and defining each vehicle as a lifestyle choice, expressing the driver's unique personality (*ibid.*, pp.185-192).

Although a strong element of the theoretical literature concerns the car, or the "driver-car", as a liberatory phenomenon (see Miller, 2001), Gartman and others conceptualise car consumerism at core as exercising a form of tyranny in that it fosters a cultural atomization and competition for space and recognition (*op. cit.*, p.193). More intimately, the comfort afforded by the pseudo-domestic environment also shields against other human contact; when Sheller cites the "humanised car" and the "automobilised person" these concepts contain the scope for both a diminution and enhancement of humanity (Lyons and Urry, 2005; Sheller, 2004). In a quite distinctive way, this physical and emotional attachment to the car distinctively affords both experience of and buffering from location. Hence, all transport can be understood as relating to location in terms of how we inhabit urban form. For example, Atkinson interprets car-use as one of several strategies of middle-class disaffiliation from the city reflecting the desire for "spatial autonomy and the protected interconnectivity of home, work and leisure sought out by high income groups" (2006, p.819).

The damaging aspects of the car's status as "the consumer good *par excellence*" (Cahill, 1998, p.252) are extensively worked through by John Adams (1999, 1999b, 2005). Adams challenges the historically dominant perspective that increases in mobility equate with increases in economic, social, intellectual and political progress (1999b). He originated the term "hypermobility" to denote excess and the pressure to move: the idea of

mobility as an expensive burden rather than a benefit or “too much of a good thing” (*ibid.* p.2). From 1996-2000 the OECD conducted a multi-phase multi-country project of *business as usual* versus scenarios for *environmentally sustainable transport* trend projections. Although the primary focus of the project was moving towards *environmentally sustainable transport* systems, phase three also considered the broader social implications of environmentally sustainable transport, particularly regarding employment and equity (OECD, 2002). Adams’ work conducted on behalf of the OECD included a comparison of the costs of mobility following a *business as usual* scenario summarized in Box 2.4.

Box 2.4 Hypermobility: The Costs of Mobility
Source: Adams (1999b)

- more polarised (*greater disparity between rich and poor*)
- more dispersed (*more suburban sprawl*)
- more anonymous and less convivial (*fewer people will know their neighbours*)
- less child-friendly (*children’s freedoms will be further curtailed by parental fears*)
- less culturally distinctive (*the McCulture will be further advanced*)
- more dangerous for those not in cars (*more metal in motion*)
- fatter and less fit (*less exercise built into daily routines*)
- more crime-ridden (*less social cohesion and more fear of crime*)
- subject to a more Orwellian style of policing (*more CCTV surveillance*)
- less democratic (*the majority will have less influence over the decisions that govern their lives*)

Adams emphasises that resolving environmental issues would still leave significant social problems, challenging the dominant ecological modernist approach which looks to technological advances to resolve concerns about the harmful environmental consequences of current and projected levels of mobility (DfT, 2008b).

2.4.5 The 'New Mobilities' Paradigm and Questioning the Derived Demand

Hypermobility, and Urry's system of automobility - coercing people into flexibility and "forcing people to juggle fragments of time so as to deal with the temporal and spatial constraints that [automobility] itself generates" - concern quality of experience and social consequences of contemporary mobility (Adams, *op.cit.*; Urry, 2004, p.7). Moreover, mobility today means more than travel between geographic points: Kenyon *et al.* define *virtual mobility* as "the process of accessing activities that traditionally require physical mobility" (2002, p.213) whilst Urry defines five types of mobility, which "form and reform social life" (2004, p.28):

Box 2.5 Urry's Mobilities

Source: Urry, 2004 p.28

- Corporeal travel of people (for work, leisure, family life, pleasure, migration and escape)
- Physical movement of objects (delivered to producers, consumers and retailers)
- Imaginative travel (through images of places and people on television)
- Virtual travel (in real time on the internet)
- Communicative travel (via letters, telephone, fax and mobile phone)

The concept of mobility has transformed into the paradigm of mobilities: Sheller and Urry challenge social science as a-mobile, since it fails to recognise social entities (comprised of people, machines and information/images) as existing in *systems of movement* (2006, p.210, emphasis added). From this perspective, these sociological analyses of travel challenge traditional understandings of transport as a derived demand since the experiences of travel, good and bad, are of value, interest and meaning above and beyond their overt functional objectives. In this vein, Mokhtarian and Salomon provide a threefold classification of a journey's elements: the activities conducted at the destination; activities

conducted whilst travelling, including; and the activity of travelling itself (2001, p.702). The evidence base relating to the positive utility of travel is discussed further in Section 3.3.2.

Transport and location are intimately intertwined. Physically, transport has been crucial in influencing the size and form of the city in the same way that the scale of urbanisation makes a range of transport options economically feasible. However, beyond this functional link, they share a conceptual space - there are parallels in how their contested impact on social interaction is understood. Transport - whether to walk, drive, cycle, take the bus - fundamentally influences experience of urban environment; conversely, location determines the range of modal options available, influencing those options' likely qualitative pleasure or enjoyment. Although all modes can be understood as offering a balance of functional and affective opportunities, the car is unique within the generic category of 'transport'. In terms of implications for personal space, the car offers tremendous mobility; sociological analysis also indicates humanity's fusion with it offers a prized relationship, a mobile personal space. Nonetheless, this mobile personal space is implicated within the wider system of automobility as something that also excludes others and, together with the concept of hypermobility and the wider mobilities paradigm, illustrates tensions in terms of the extent to which continuing to privilege the car as the dominant mode of transport is either necessary or desirable.

2.5 The Compact City Hypothesis

2.5.1 Defining the compact city

In his essay on "Urbanism as a way of life", Louis Wirth, of the Chicago School of urban sociology, theorised distinctive urban modes of living and defined three key characteristics of the city: population size; density of settlement; and heterogeneity of inhabitants and group life (1938).

Although this has been an abiding definition, it is notable that such criteria are culturally and temporally relative. Ideas about what might constitute a city range across (numerous different) population thresholds, administrative boundaries, functional rationality measures such as travel to work areas, availability of amenities or even designation by royal charter. Beyond these physical definitions exists a body of literature, *urban theory*, which *a priori* identifies something distinctive about the city, seeking to understand it at a conceptual level as a social institution, both the product and the driver of social organisation (Mumford, 1961; Park *et al.*, 1967; Weber, 1960). Perhaps in recognition of our ability to synthesise diverse physical and sociological criteria, Marshall takes the view that we know one when we see one; that “there is something ‘city-shaped’ about cities that we recognise despite the difference between individual cases”(2005, p.6).

Defining the *compact* city produces the same challenges as defining the city itself. The idea seems essentially simple: a high-density, mixed-use urban centre where development occurs, building inwards or upwards, within the bounds of the city (Jenks *et al.*, 1996b; Williams *et al.*, 2000). Land uses are generally classified under the headings of: residential, commercial, recreational, community, institutional and transportation (Lau *et al.*, 2005). However, with regard to analysing more exactly what might constitute “compact”, Jenks and Dempsey question the significance of density when it comes to suggesting standards and forms for development (Jenks and Dempsey, 2005). DETR guidance specifies the measure most commonly used by local authorities in terms of dwellings per hectare, including access roads, gardens, car parking, incidental open space and children’s play areas (DETR, 1998, 2000b; Jenks and Dempsey, 2005). However, they also review gross measures, which reflect *all an area’s* uses, rather than only residential properties, and raise the issues of scale, boundary definition and the difficulties of accurately converting one set of measures to another (*ibid.*, pp.291-294).

Regardless of the measures chosen, the definition of the city remains relative and perspective-dependent. Beyond the complexities of defining density within any given setting, what constitutes mixed use also varies across nations; as well as mixing land uses within blocks or the wider urban area, multiple functions may be planned *within* individual buildings, both horizontally and vertically (Rowley, 1998, cited in Lau *et al.*, 2005, p.155). Considering the variations in what might be defined as a dense, mixed-use urban area, Geurs and van Wee (2006) note that a compact city in the US may be a low-density development in the Netherlands.

However, it is comparatively straightforward to define the *process* of compaction (also called intensification). Williams *et al.* (1996) describe a dual classification developed by Oxford Brookes University and Entec, classifying strategies for the intensification of both built form and activity (see Box 2.4).

Box 2.6: Urban Intensification Strategies

Source: Williams *et al.* (1996, p.84)

Built form intensification:

- Redeveloping existing buildings or previously developed sites, at higher densities
- Subdivisions and conversion of buildings
- Building additions and extensions to existing structures
- Developing previously undeveloped urban land

Activity intensification:

- The increased use of existing buildings or sites
- Changes of use leading to increased activity
- Increases in the number of people living, working in or travelling through an area

2.5.2 Sustainability and the Compact City

Central to the compact city hypothesis is the relationship between urban form and sustainability: dense, mixed-use neighbourhoods are theorised as being more sustainable than low-density, zoned-function areas (Hillman, 1996; Williams *et al*, 2000; Jabareen, 2006). The hypothesised benefits of the compact city (see Box 2.5) have most controversially been extended to claims about energy consumption and social equity. Although both such alleged benefits of dense settlement are beyond the remit of this research, most aspects of the hypothesis bear a relationship to social interaction and participation (essential to the concept of inclusion) (Hills, 2002), while also complementing the ambitions of the urban renaissance (see Carmona, 2001).

Box 2.7: Claimed Benefits of the Compact City
Source: Burton (2003)

Claimed Benefits of the Compact City

- conservation of the countryside
- less need to travel by car, thus reduced fuel emissions
- support for public transport, walking and cycling
- better access to services and facilities
- more efficient utility and infrastructure provision
- revitalisation and regeneration of inner urban areas

Taken as individual points, Burton's compilation of reduced fuel emissions and conservation of the countryside reflects both the current and historical concerns of the environmental lobby. However, in the context of transport geography, the proximity of services and facilities forced by bounding urban development can be theorised as facilitating greater accessibility and less need for car travel. The older European cities, idealised as the epitome of compact development, typically have narrower streets, less suited to a

high volume of car traffic (Thomas, 2002), effectively constraining car access through congestion and limited parking space. Again, it can be theorised that, given the car's status as a competitive mode, reduced car access will foster increased walking, cycling and demand for public transport. The latter, alongside the reduced congestion and land use requirements for car travel, can be argued as a more efficient use of infrastructure. Drawing, as before, on the opposition of car travel and the other modes, the resulting increase in foot traffic and urban interaction can be said to add vitality to the urban realm. Beyond claimed environmental and efficiency benefits, Burton observes that urban compaction is also hypothesised as promoting social sustainability, as it relates to equity as well as quality of life (Burton 2000a and 2000b, 2001, 2003).

2.5.3 Urban Theory and the Compact City

With regard to social equity and transport, Barry contends that “public transport is the most effective way [...] of creating conditions of common fate”, noting wryly that being ‘all in the same boat’ is the standard applicable metaphor and contrasting that with the incivility of road rage (1998, p.21). These observations link the compact city to its roots in urban theory, which, in keeping with the *new mobilities* paradigm, has motion, interaction and engagement as its essence. Although earlier writers such as Tönnies (1955) and Simmel (1950) had theorised growing urbanisation as impacting upon human behaviour in a unique way, it was the Chicago School of sociologists in the 1930s which first saw urban development and the movements and interactions of people within cities as an ecological system. Wirth's analysis of the city's nature did more than define its core characteristics; the relationship between urban form and human behaviour has reciprocal status. Urbanism is “a way of life” (1938). Mumford uses an anatomical metaphor (Pile, 1999) in describing the city as a “geographic

plexus” before continuing to expand his understanding of the built environment as generative of creativity and contact:

“The city in its complete sense, then, is a geographical plexus, an economic organisation, an institutional process, a theater of social action, and an aesthetic symbol of collective unity. The city fosters art and is art; the city creates the theater and is the theater. It is in the city, the city as theater, that man’s more purposive activities are focused, and work out, through conflicting and cooperating personalities, events, groups, into more significant culminations.” (Mumford, 1937, p.94)

Against this backdrop, Jane Jacobs conducted her seminal analysis of mid-20th century Greenwich Village life (1961). She observed a dense urban environment where small blocks incorporating a variety of land uses overlooked the street, ensuring that a mixture of residents and strangers occupied shared urban space over the period of a day. From ethnographic observation, she theorised relationships between this urban form and the social interactions that took place within it; diversity, of various kinds (see Box 2.8), was understood as necessary to fulfil the potential of a neighbourhood.

In combination, urban density, streets connecting small blocks, mixed land use, and a variety of buildings and neighbourhood parks have value for the patterns of movement and interaction which they foster, supporting safety, social contact and what she describes as “the assimilation of children” (*ibid.*, pp.74-88). Jacobs’ conclusions seem to presage contemporary understandings of social capital, establishing informal networks, shared norms and light social ties as the foundation of community trust and security (Bourdieu, 1986, Fukuyama 1997; Granovetter, 1973; Putnam, 1995). Her work has been critiqued as romanticising: Gottdiener and Budd (2005) point out that the area where Jacobs conducted her research was later gentrified and many of the inhabitants she spoke of were moved out, but her work has nonetheless been extremely influential; the *New*

Urbanism movement - or the *Urban Renaissance* agenda in the UK - is effectively the policy manifestation of Jacobs' analysis (Jabareen, 2006).

Box 2.8: The Generators of Urban Diversity
Source: Jacobs (1961, pp.150-151)

Jacobs considered all four of the following conditions are necessary for urban diversity:

1. The district and as many of its internal parts as possible should serve more than one primary function; preferably more than two. These must ensure the presence of people who go outdoors on different schedules and are in the places for different purposes, but who are able to use many facilities in common.
2. Most blocks must be short: streets and opportunities to turn corners must be frequent.
3. The district must mingle buildings that vary in age and condition, including a good proportion of old ones so that they vary in the economic yield they must produce. This mingling must be fairly close-grained.
4. There must be sufficiently dense concentration of people, for whatever purposes they may be there. This includes a dense concentration in the case of people who are there because of residence.

The Congress for the New Urbanism (CNU), a coalition of activists and multi-disciplinary professionals concerned with the urban realm, has been described as the most significant movement in urban planning over recent decades (Marshall, 2005). Although Jacobs herself opined that “we blame automobiles for too much”, she nonetheless identified dependence on the private car and urban concentration as incompatible (1961, p338). Accordingly, the Charter of the New Urbanism advocates pedestrian-friendly design, supported by public transport (CNU, 2001), promoting the street life prized by the urbanists of earlier in the 20th century.

2.5.4 Critiques

The compact city hypothesis, particularly relating to social sustainability, is bound up with a vision of the city which privileges neighbourhood-level

interaction. The presence of ‘the stranger’ in Jacobs’ urban milieu highlights another preoccupation of urbanist literature: urbanism values not only social interaction but interaction with difference, with the other (Mandipour *et al.*, 1998; Sennett, 1970). From the urbanist perspective it is the co-location of difference as much as form or scale that defines the city. Short relegates homogenous urban areas to the status of “a large urban settlement” in contrast to “a place where *difference* is created, maintained and sometimes undermined” (2006, p.6, original emphasis). For some theorists this provides a wider social function, valuing the city as an arena where the capacity to engage with or even confront difference has a cathartic social and personal value (Sennett, 1970; Mooney, 1999). Fincher and Iveson regard the new urbanist agenda as deploying urban design in order to overcome social fragmentation by building shared values and a sense of community (2008).

The mesh of rationales underpinning urban compaction can be seen as demonstrating a highly normative vision of what the city *ought* to be. As such, the compact city hypothesis may be challenged on desirability as well as viability.

Considering first the topic (viability), it has been argued that the separation of land-uses and the pejoratively-named “sprawl spiral” of urban areas are products of specifically car-orientated development (Alvord, 2000, pp.42-43). However, as Whitelegg notes, not all high-density urban areas are necessarily sustainable (1994) and density itself provides no guide to land capacity, mixed uses, ‘walkability’ or the viability of public transport (Rudlin and Falk 1999, cited in Jenks and Dempsey, 2005). Furthermore, the idea that changes in the physical environment will change neighbourhood-level interpersonal relations has been derided as architectural determinism, leading to a “reification of neighbourhood and its imagined community” (Gans, 1991; Gottdeiner and Budd, 2005, p.99). Recent qualitative research has indicated that ‘place attachment’ - the

emotional bonds that people feel for an area - is supported by the development of social networks in the area (Livingston *et al.*, 2008). Nevertheless, regardless of the degree to which walking, cycling and public transport, as slower and arguably more social means of mobility, might promote local interaction, the main normative challenge to the compact city lies in that interaction's desirability.

Secondly, the objectives of the urban renaissance as much as its feasibility are problematised by the combative positioning of different thinkers as "centrists, de-centrists or compromisers" (Breheney, 1996, p.29). In something approaching an ideological battle, dense urban forms have often been placed in opposition to sprawl: articulating an extreme centrist position, Giddings *et al.* write that "cities convey something special about civilisation itself that should not be spread too thinly or reduced to banal, lifeless, endless sprawl" (2005 p.13). Nonetheless, even where urban neighbourhoods offer amenities within walking distance and possess "traditional" neighbourhood centres linked by public transport, it is possible to agree that city life offers unparalleled vitality, tolerance, opportunities and accessibility (Gottdiener and Budd, 2005) without aspiring to *live* in an urban environment.

The idea that settlement size changes not just the quantity of human contacts but also their nature is persistent (Flanagan, 1993; Gottdeiner, 1985). Jacobs' urbanism paints only a partial picture: the history of urban theory can be seen as the history of attempting to understand geography's impact on human relationships; it is also a history of ambivalence towards large, dense settlements. Towards the pessimistic end of the analytical spectrum, the city has been seen as a place where true community values cannot survive (Tönnies, 1955). Although the city offers opportunity and excitement, the intensity of physical proximity makes it necessary to disregard or de-personalise the mass of others (Simmel, 1950; Wirth 1964). From a contemporary perspective, the increasing presence of gated

communities and other architectural practices designed to physically and symbolically exclude can be understood as mechanisms for managing and simultaneously marginalizing unwanted others (Davis, 1991). However, both the informal 'urban village' gathering of people with similar backgrounds into specialised neighbourhoods and formalised gated communities have also been interpreted as demonstrating a positive drive for like to seek out like (Cheshire, 2007; Gans, 1962; Manzi and Smith-Bowers, 2006). This could be construed as a desire for homogeneity even within the urban environment: the antithesis of the urban renaissance vision that seeks shared values in diversity.

Schoon's analysis in *The Chosen City* reiterates that the sustainability of the urban renaissance rests upon making urban environments desirable to people with choices rather than the residual option (2001). However, the goal of promoting dense urban settlement is also rendered problematic by a lack of clarity about exactly what it is that people are choosing when they move to urban areas. Tunstall describes a balance within housing decisions, potentially trading off reduced living space or less desirable accommodation against shorter commuting times (2002); similarly, Storper and Manville discuss locational decisions as comprising various choices, within which it is necessarily unclear which attributes are more important, or even desirable (2006).

Beyond the desirability of what an urban environment might offer is the issue of its desirability in its own right. Town and city living in the UK has a historical association with overcrowding and poverty based in the rapid urbanisation of the industrial revolution (Jenks and Dempsey, 2005). Indeed the dismissal of urban compaction as 'town cramming' (Hall, 2001) could be interpreted as the reverse position of describing decentralised suburban development as 'sprawl.' Bretherton and Pleace (2008) found that the quality of urban environment, rather than the density, was the essential aspect of how people experience their homes. Architectural design allowing

a large amount of natural light was perceived as offering a sense of space such that many respondents in the study did not consider themselves to be living at high densities (*ibid.*).

Using preference experiments to distinguish preferred property and neighbourhood characteristics from sub-optimal and unacceptable features, Senior *et al.*'s research confirms a preference for lower density living in detached or semi-detached properties with private garden space (Senior *et al.*, 2006). However, although this was the dominant ideal, in terms of alternatives they found no strong counter-urbanisation preferences, with city centre or regenerated dockland areas considered as attractive alternative locations. Similarly, they found that terraced and semi-detached properties were considered an acceptable compromise in the absence of detached housing. Regarding non-movers in higher density areas, Senior *et al.* noted a need to understand their satisfaction with different facets of their residential environment, commenting that households without a car face a tension between the desire for accessibility and possible negative externalities when considering mixed-use areas (*ibid.*, pp.54 - 55).

2.5.5 Summary

The compact city vision is contested and the normative component of contemplating "the city" in the abstract is equally apparent in theoretical literature as in policy. Nonetheless the idea that walkable neighbourhoods with efficient public transport links will reduce the need for car travel is, at the very least, intuitively appealing. Furthermore, the hypothesised impacts of urban form on levels of car ownership/ use lend theoretical validity to possible divergence between increased income and increased use of personal transport, implying the existence of urban spaces where car ownership/use is lower than might be anticipated solely on income grounds.

2.6 The Social Inclusion/ Exclusion Paradigm

2.6.1 Conceptualising Disadvantage in Britain

“Despite various attempts to conceptualize disadvantage over the past 100 years, it is generally agreed that no unique and universally acceptable definition exists, nor is ever likely to.”
(Barnes, 2005, p.7)

Although developing mechanisms for managing and rationing diverse wants or needs in the face of limited resources is a key function of public policy, Barnes’ statement remains applicable. Gordon tracks the history of poverty research being used to inform policy in Britain back to the scientific revolution of the 17th and 18th centuries (2006). However, it was from the late 19th century onwards that the role of poverty in disadvantage and a sense of moral imperative to address it were widely accepted. Detailed social research into the geographic patterning of urban poverty in particular, by Booth and Mayhew in London and Joseph, and later Seeborn Rowntree in York helped to establish the Victorian tradition of social reform (Pierson, 1998). The early emphasis of measuring disadvantage was on income, as an indirect indicator of resources. This employed designated thresholds below which subsistence was considered problematic (Barnes, 2005). The incrementalist British tradition was founded on an empirical, positivist approach rather than on any kind of conceptual or egalitarian framework; Pierson notes that “although there was widespread debate about the responsibility of the poor for their own poverty, there was an increasingly widespread belief that such poverty was remediable and thus ought to be remedied” (Gordon, 2006; Pierson, 1998, p.17).

Following the Second World War, there were extensive changes as, subsequent to the Beveridge Report, the Education Act was adopted and the National Health Service (NHS) established in 1944 and 1948 respectively. Although it has since been argued that the degree of party

political unity at the time is overstated, the new social policy framework could be described as a manifestation of a new sense of social solidarity post-war, reflecting a widespread professional consensus about not only the desirability but the nature of welfare state development (Pierson, 1998).

From the enlightenment scientists to the inauguration of the NHS is a long journey. Nevertheless, the approach to disadvantage throughout was one conceptualising poverty in absolute terms. It was considered a problem of material deprivation, the solution to which was supporting minimum standards of subsistence in different ways. Although the adoption of the welfare state in the mid-20th century represented a radical development in the articulation and administration of acceptable minimum standards, a conceptual revolution in understanding disadvantage only emerged in the late 1970s.

Townsend's work drove widespread acceptance of the concept of relative deprivation. Rather than considering the proxy measure of poverty, his research pioneered the acceptance of more direct measures of disadvantage. By developing indicators correlated with income, he created a deprivation index, allowing the assessment of both material *and* financial hardship. He achieved this by identifying items and activities considered necessities by normal standards and then directly measuring deprivation across twelve subcategories (Townsend, 1979). By advocating consideration of material deprivation, Townsend's analysis differed in both kind and magnitude. Shifting the conceptual focus to deprivation introduced a relative component into the understanding of poverty. The deprivation index inevitably situated poverty temporally and geographically in relation to social norms and revealed lack of resources, *relative* deprivation, as inhibitive of social participation, as well as a problem of subsistence:

“[Poor] people are deprived of the conditions of life which ordinarily define membership of society. If they lack or are

denied resources to obtain access to these conditions of life and so fulfil membership of society they are in poverty”

(Townsend, 1979, p.915)

Another conceptual development lay in the necessarily multi-faceted nature of deprivation, which required understanding of a range of circumstances rather than a single measure of income. The evolution from Townsend’s original work towards later nationally representative surveys of deprivation and social exclusion is outlined in section 3.2.1 but at this stage it is also relevant to consider the implications of Townsend’s poverty definition above. As Levitas observes, “resources” means more than cash income: it also includes collectively organised services, i.e. the provision of the welfare state (2000).

2.6.2 From Deprivation to Social Exclusion

An implicit deviation from 19th century arguments about the “deserving poor” derives from Levitas’ (*op.cit.*) point that collectively provided services constitute one aspect of the resources which keep people from poverty (Pierson, p.18); in this conception of poverty, the state has at least partial responsibility to alleviate the risk of deprivation. The shift to a relational concept of disadvantage can therefore be considered doubly problematic. Firstly, social divisions based on income, wealth, education and housing are not only integral to advanced western societies; the dominant view is that inequalities of pay and reward are essential driving components of the economic system (George and Wilding, 1999). To some extent this perspective is incompatible with relational perspectives on deprivation. Furthermore, Liddiard emphasises that using social norms such as average expectations and average incomes to define deprivation makes reducing poverty impossible without tackling inequality (2003).

The classic response to this historical dilemma in British welfare provision is exemplified by Tawney’s statement that “It is the

mark of a civilised society to aim at eliminating such inequalities as have their source, not in individual differences, but in its organisation” (1931, p.57, cited in George and Wilding, 1999, p.130). Disadvantage is mitigated through focusing on equality of opportunity, which blends social liberal ideals and a social welfare perspective (Dean, 2003).

Within the context of British conceptions of disadvantage, the welfare state’s social solidarity aspect, working against institutionalised inequality and the conceptual shift from measuring absolute poverty to creating relational indices, converges with disadvantage understood as social exclusion.

2.6.3 The inclusion/exclusion paradigm

The genesis of the term “social exclusion” is widely attributed to René Lenoir, the Secrétaire d’Etat à l’Action Sociale of the French Government, in the early 1970s (Daly, 2006; Sen, 2000). The initial application referred to groups of people or households somehow socially marginalised (‘les exclus’), but the term’s rapid adoption saw the list extended quickly to include things from which people may be excluded, including income, credit, education, cultural capital, democratic participation, sociability and respect (Percy-Smith, 2000; Sen, 2000; Silver, 1995).

Social exclusion can be seen as lending greater subtlety to our understanding of the mechanisms of disadvantage. The academic, rather than policy, roots of the paradigm lie in French history, with its stronger conception of civil society than the UK (Silver, 1994; Taylor, 1999; Walker, 1995). Berghman understands social exclusion by relating it to Marshall’s analysis of citizenship (1950), which was defined as including civil, political and social rights; social exclusion in these terms refers to “a breakdown or malfunctioning of the major societal systems that should guarantee full citizenship” (Berghman, 1995, pp.19-20). Hence, there are many economic, cultural and social mechanisms through which exclusion might occur,

determining the individual's integration in society as well as many potential dimensions of exclusion (Burchardt *et al.*, 2002; Walker, 1997). As such, investigating exclusion necessarily requires more than one set of indicators (Levitas, 2000).

Within a policy context, social exclusion functions to identify cases where there is, based on agreed parameters, cause for intervention. It is, therefore, unsurprising that policy focuses on the negative manifestation of *exclusion*. Insofar as it positions an individual, household or geography positively or negatively in relation to a presumed or designated social mainstream on any given dimension (Duffy, 1995); social exclusion can be a curiously binary idea, notwithstanding its many potentially definable and measureable dimensions. As such, albeit somewhat covertly, it can be seen as paradigmatic rather than conceptual, in that it implies an overarching frame of reference within which 'normal business' is conducted (Marshall, 2005, p.119).

Drawing from Room's edited collection on the measurement and analysis of social exclusion (1995), it is also notable that social exclusion is commonly defined in opposition to poverty (Table 2.2).

Tracing the trajectory of understanding disadvantage in terms of income poverty to multiple deprivation highlights social inclusion's claims to a more comprehensive vision of disadvantage. The shortcomings of income measures are well established: they ignore living conditions or geographic variations in the cost or availability of the material necessities which they proxy (Silver and Miller, 2003). The relational and multi-dimensional components claimed for social exclusion improve on this, echoing Townsend's multiple deprivation indices, as does the recognition of place. Exclusion can occur at various levels, affecting the individual *as* an individual, as a member of a particular community or due to wider spatial considerations. At whatever level, exclusion across more than one

dimension of disadvantage has been called “deep exclusion” and is considered to impact particularly negatively on quality of life, wellbeing and future life chances (Levitas *et al.*, 2007, p.9).

Table 2.3 Key Attributes of Social Inclusion/ Exclusion
Derived from Room (1995)

Broad	Considers social as well as financial and material deprivation
Relational	Acknowledging physical and social contexts, so involving issues of integration, participation and power
Multi- dimensional	Access to goods and services, education, employment, working environment, housing, health.
Multi-level	Personal, household, community, regional, global (considers place)
Dynamic	Processes and systems initiating and sustaining disadvantage rather than state - duration, change across time and circumstances
Agency	Considers exclusion from what by whom. Question of permanence and separation

The acknowledgement of the role of place in disadvantage is often considered particularly characteristic of social exclusion (Kristensen, 1995), and has relevance for the urban context of the research topic. Church *et al.* considered inclusion/ exclusion in terms of a disconnection, where the excluded are people who have “lost the ability to both literally and metaphorically connect with many of the jobs, services and facilities that they need to participate fully in society” (2000, p.197). On one hand, this categorisation emphasises the added vulnerability of those reliant on public transport, dependent on the development and maintenance of networks largely beyond their control. It also underlines the complex and contested

role of causation in social exclusion, problematising the extent to which lack of financial resources might constitute the fundamental problem in discussions about inclusion/ exclusion.

The two final attributes of social exclusion listed in Table 2.2 are that it is dynamic, concerned with process and systems initiating and sustaining disadvantage, and that it seeks the role of agency, in terms of how and from what exclusion takes place. Social exclusion is commonly regarded as a process rather than a state (Levitas, 2000); one perspective considers that the persistence of disadvantage over time is the fundamental concern (Room, 1995; Barnes, 2005). It is not simply being in an 'excluded' state by virtue of unemployment or income, but the lack of prospect that things will improve (Atkinson and Hills, 1998). Both such characteristics acknowledge that various socio-economic factors can influence the static outcome measures of poverty or deprivation that earlier approaches to disadvantage have emphasised (Burden and Hamm, 2000; Lister, 2000; Sparkes and Glennerster, 2002). They also have relevance for policy, notably reflecting the scope for state intervention in (selectively) mitigating disadvantage (Byrne, 2005; Levitas, 2000).

The linguistic turn in policy analysis is founded in a social constructionist perspective which regards language as profoundly shaping our view of the world rather than simply reflecting it; the framing of a problem influences both what is seen, what is neglected and, hence, the solutions proposed (Fischer and Forester, 1993; Rein and Schön, 1993). Levitas analyses policy applications of "social exclusion" in terms of discourse, identifying three distinct underpinning sets of values: redistributionist, social inclusion and moral underclass discourses (2005), each of which necessarily carries different implications for solutions to the problems of disadvantage (Table 2.4).

Table 2.4: Exclusion and Discourse
Source: Levitas, 2005 (pp.7-28)

Abbreviation	Discourse	Implications
RED	Redistributionist discourse	Critiquing inequality; advocating redistribution of wealth
SID	Social integrationist discourse	Emphasising paid work; employment as solution to exclusion
MUD	Moral underclass discourse	Pathologising discourse; changing or controlling behaviour

It is notable that New Labour discourse progressively gravitated towards SID, positing the solution to lack of integration as increasing wealth by increasing employment levels (Levitas, 1998; 2005). Bailey also indentifies an increasingly punitive approach, in “the growing use of sanctions and compulsion to pressure ‘those who can work’ to do so” (2006, pp.163-4). Both at European and UK level, paid work has been positioned as the pathway towards social inclusion, lifting people out of poverty (Lister, 2000). Given the correlation between increased affluence and increased car ownership and use, this has implications for transport and environmental strategy: the move towards social *inclusion* means increased purchasing power, more cars, more travel and more environmental stress.

2.6.4 Critiques

An underpinning idea in this research is that better understanding of the mechanisms of social inclusion might yield policy strategies for decoupling economic growth from rising car ownership/ use in urban contexts. Effective exploration of this idea presupposes consideration of the main critiques and thus possibly the main limitations of the inclusion/ exclusion paradigm.

Barnes voices the most common criticisms of social exclusion, observing that it lacks conceptual clarity and an agreed means of measuring it (2005). This problem is magnified for the inclusion/ exclusion paradigm in that there are three conceptual tiers in operation: the dimension to be captured; its operationalisation; and the threshold cut points which divide the 'included' from the 'excluded'. Although Levitas also comments that consensus exists neither on the phenomenon nor the causes of social exclusion, she also notes that this is a ubiquitous challenge in quantifying social phenomena (2000); for other commentators, the lack of a precise definition offers the flexibility around which a political consensus can be built (Atkinson and Hills, 1998; Stewart, 2000).

However, the nature of that consensus forms the source of a deeper challenge. Saunders attributes the rapid adoption of the social exclusion paradigm within the UK to an unwillingness or inability to address poverty: the "official rejection of 'the p-word' and the failure of 'p-research' to exert any policy impact" (2003, p.16), while Gray analyses the adoption of social inclusion as policy goal in some western European states as a strategy based on electoral expediency in "an attempt to conserve some of the core aspirations of social democracy in an historical context in which many of its classical objectives have ceased to be achievable" (2000, p.19)⁸. The shift from an egalitarian (distributional) to an inclusionary (relational) perspective can be understood as concealing poverty's significance. Although Piachaud and Sutherland make the point that not *all* resources and choices are determined by income, he subsequently refers to the state's role in providing education and health care, and then poverty's indirect impacts on social environment and community life (Piachaud and Sutherland, 2002). The inclusion/exclusion paradigm encompasses concern with issues such as gender, ethnicity, religion, sexuality, age and household structure (Burchardt, 2000; Lister, 2000). Poverty is nonetheless central,

⁸ He goes on to argue that, although overlap exists between the relational perspective of social inclusion and more egalitarian distributional concerns, both are ultimately inadequate as a political response to global *laissez-faire* (*ibid.*).

and there is concern with duration and that a focus on relative advantage and disadvantage might distract attention from (particularly economic) inequality (Levitas, 2000).

Another area of concern lies in the issue of agency and a mainstream of society from which people are excluded. This implies a normative assumption that such exclusion is always undesirable. Townsend's original deprivation indicators were criticised for not differentiating between people who *chose* not to have/ do particular things and those who were *unable* to have/ do them (Levitas, 2006, p.149).

Car ownership provides an example here in that it is frequently used as a proxy for income; the absence of household car ownership might be interpreted as exclusion on a personal mobility dimension or, through conflation with income, as economic exclusion without any verification of whether that 'exclusion' was voluntary or involuntary. On that basis, economic dimensions of exclusion might be considered as different in kind from others in that *choosing* to fall below what is effectively a poverty threshold, whilst not impossible, could be considered extraordinary. However, there are differing attitudes towards what kinds of social interaction are valued and, as discussed in section 2.2.2 above, the necessity or desirability of a place-based community built on local interaction is highly contested.

A further critique of inclusion/ exclusion involves the extent to which it genuinely represents a new idea. Focusing firmly on poverty analysis, George and Wilding cite class, gender, ethnicity/race and age as the four major dimensions of inequality and note that these inequalities are interdependent and tend to reinforce one another (1999, pp.130-131). Bailey *et al.* observe that the distinction between social exclusion and multiple deprivation is more a matter of practice than theory and warn

against overstating the distinction between the two ideas:

“... deprivation has been associated with a narrower emphasis on living standards and the financial or material resources which play a significant part in determining these. Social exclusion has been associated with a broader focus which emphasises the importance of relational aspects of life - social, cultural or political - as well as distributive or material”. (Bailey *et al.*, 2004 p.i)

Similarly, Lyons heralds the policy attention being given to inequitable life chances as a new phenomenon over any distinctive characteristic of social exclusion (2003). Sen also values the social exclusion approach for its practical influence in highlighting the relational aspects of deprivation (2000). Conceptually, however, he is emphatic that looking at “impoverished lives, and not just at depleted wallets” has an analytically well-established history (*ibid.*, p.3). Citing both Aristotle and Adam Smith, Sen is interested in poor living as it relates to inadequate income, which can inhibit freedom to undertake activities of the individual’s choosing and engender shame. He is overt about his normative grounding, considering human life as fundamentally social and that exclusion from social life limits living opportunities, leading to other deprivations. Hence, he contends that exclusion from the process of governance and political participation impoverishes life, regardless of income (*ibid.*, p.38). Notably here, Sen conceives of exclusion in terms of restraint from participation, rather than any imperative to participate⁹.

Sen defines social exclusion within his own analytical framework, as a subset of poverty, understood as a capability deprivation (*ibid.*). He began developing his capability approach as a product of analysing the concept of equality (Sen, 1980). Moving away from personal utility and the Rawlsian approach to resources, Sen’s analysis focuses on the capability to realise

⁹ Unlike Nussbaum, who advocates an objective evaluation of which functionings contribute to a “good human life”, Sen opposes fixing a predetermined list of core capabilities, considering this as beyond his remit as a theorist (Nussbaum, 1988, p.176; Sen, 2004).

functionings: that is, equalising the freedom to *do* or *be* rather than seeking equal resources or outcomes (1980; 1985). Although the potential range of *doings* and *beings* also implies a range of different capabilities that might be required to achieve them, the capabilities approach can also be employed as an evaluative framework to designate a subset of ‘basic capabilities’ required to avoid poverty and deprivation (Sen, 1987).

Although both the inclusion/exclusion paradigm and the capabilities approach value social interaction and the idea of participation in society, they differ in how the nature of the relationship between the individual and society is expressed. The former stresses the influence of social structures on the individual and, although it can be argued that there is a spectrum of deprivation rather than a binary divide (Lyons, 2003), the designation of a threshold point nonetheless presupposes an acceptable norm. Whilst, with regard to poverty, the situation of that threshold point (rather than its existence) is the matter of debate, matters relating to what quality or quantity of social or political participation should be deemed included or excluded are far more subjective. In contrast, the capabilities approach prioritises the *capacity* (i.e. the freedom) to achieve a particular functioning, rather than its exercise.¹⁰

2.6.5 Summary

Considering indirect measures of need, poverty has been conceptualised both absolutely and relatively, standing as proxy for a threshold of subsistence or distributional minimum respectively (Room, 1995). The value of the inclusion/ exclusion paradigm can be considered as setting an agenda to analyse patterns of disadvantage distinct from (but additional to) poverty. However, critiques challenge the extent to which genuine distinctions

¹⁰ The capabilities approach has been criticised as being too individualistic, although Robeyns refutes this (see Robeyns, 2006).

between social inclusion/exclusion and more conventional measures of disadvantage are actually made in practice. Furthermore, the clouded issue of setting criteria for definition and measurement of dimensions, and the question of the role of individual agency in what Sen might term 'the exercise of functionings' are also problematic in that the extent to which any explicit operationalisation of the paradigm is meaningful to the populations it supposedly describes remains moot. These criticisms will be considered in respect of the methods through which the research design is realized.

2.7 Summary – The Theoretical Context

The preceding sections establish the theoretical basis for researching the possibility of urban social inclusion without the car. Despite the powerful correlation between income and car ownership, new conceptions of mobility problematise both the desirability of a hyper-mobile society and the importance of physical movement in the light of virtual travel and developments in internet and communications technology. Furthermore, the compact city hypothesis suggests that, although the significance of urban densification for energy consumption remains moot, a mixed-use urban environment nonetheless carries scope for reduced levels of car ownership and use alongside increased social interaction, in that the greater accessibility implied by urban density may facilitate economic and social participation with less need for mobility. The social inclusion paradigm, valuing participation in society along a range of dimensions rather than simply on a continuum of affluence, is also congruent with the urban renaissance conception of a sustainable urban environment. The relative accessibility of urban space may mitigate the potentially isolating impacts of lowered mobility resulting from financial exclusion; similarly, the urban renaissance vision encompasses the scope for reducing levels of car ownership/use in more affluent households without rendering the city an unattractive locale by inhibiting their participation on other dimensions of inclusion.

However, the theoretical literature underpinning the core policy ideas does not accommodate a simple conceptual framework. Firstly, the urban renaissance vision is highly normative, belying urban theory's historical duality and ambivalence towards the city. Secondly, critiques of social inclusion indicate the indeterminate role of economic affluence within the paradigm. Technically speaking, there is necessarily an arbitrary element in setting the threshold point between inclusion and exclusion on any given dimension. Furthermore, although not in direct response to the paradigm, Sen's work on capabilities highlights the paradigm's failure to account for individual agency in contrast to the wider social mechanisms that the inclusion/exclusion paradigm seeks to understand.

3 The Empirical Evidence Base

3.1 Introduction

This chapter is concerned with empirical evidence relating to the main themes of the research. This provides a commentary on attempts to operationalise the social inclusion/exclusion paradigm, noting some general implications for research into travel and transport. Additionally, a more specific treatment of mobility as a dimension of inclusion is given, developing the idea of the car as a competitive mode and providing evidence from investigations of transport exclusion and car dependence. The review of empirical literature concludes with an examination of research centring upon housing and mobility issues related to the compact city hypothesis. Finally, the chapter draws on the outlined theoretical background and evidence base to define the main research questions, designed to indicate the potential for sustaining social inclusion with reduced car ownership and use in an urban setting.

3.2 Quantifying Social Inclusion/ Exclusion

Barnes counterposes the level of policy interest in social exclusion across Europe against the fact that “empirical investigations have been few and far between” (2005, p.168). This section outlines the trajectory of social surveys in the UK over the conceptual shift from interest in deprivation to a focus on exclusion. The Bristol Social Exclusion Matrix (B-SEM) is then used to illustrate the various dimensions across which the inclusion/ exclusion paradigm might be operationalised. Thereafter, evidence on the car’s role within inclusion/ exclusion frameworks is considered, and the Barnes (2005) and Burchardt *et al.* (2002) models of social exclusion are reviewed. The

Burchardt et al. model (*ibid.*), used as the basis of the quantitative analysis of social inclusion in this thesis, is presented in some depth.

3.2.1 From Townsend to the Millennium Surveys

Townsend (1979) has been a seminal influence on attempts to understand and quantify disadvantage. The research's core material was based on the survey of a nationally representative sample of 2000 households conducted over 1968 and 1969, simultaneously drawing on income data from other studies undertaken during the 1970s. The conceptual innovation of quantifying relative disadvantage through measures more direct than the study of income was operationalised through the use of indicators. The rationale behind the selection of indicators was that they were to be on "the customs or modes of living of a majority of the population" (*ibid.*, p.251). The first formulation of the Townsend Deprivation Index was achieved by selecting indicators using pilot interviews and drawing on existing studies relating to life-cycles and amenities. These sixty indicators were validated based on a significant correlation with net disposable household income, subsequently being applied to either individuals or households to yield a deprivation score, with a high score indicating low level of social participation.

Townsend continued to refine this approach and indices of multiple deprivation (IMD) have become commonplace in collecting government statistics. Reviewing the range of government data in 2005, Barnes highlights HBAI (Households Below Average Income) statistics on non-monetary forms of disadvantage, ONS indicators on 13 areas of national life and DETR quality of life indicators amongst others (pp.19-22). Although his enthusiasm is qualified, of all available official measurements of disadvantage, Barnes displays most interest in the *Opportunity for All* reports (available from 1999 onwards). These annual reports on poverty and social exclusion provided 32 quantitative indicators, designed to allow an

evaluation of government policy as it related to education, employment, housing, health and crime as well as income levels (see for example DWP, 2007). These capture what Barnes later calls “political rather than theoretical notions of social exclusion”, produced to measure specific forms of disadvantage rather than present a conception of social exclusion (Barnes, 2005, p.29).

Nevertheless, since Townsend there has been an increasing shift towards the use of indicators quantifying a conception of deprivation that involves exclusion from an implicit mainstream of social participation. The first of the *Breadline Britain* surveys, conducted in 1983, developed a more consensual approach to the selection of deprivation indicators. Rather than relying on academic or governmental expert opinion on what might constitute deprivation, this nationally representative survey attempted to overcome what Gordon and Pantazis would later describe as “the problem of experts” (1997, p.13) by being the first to identify a long-list of items *and activities* which they considered necessary for an acceptable standard of living. Thereafter, items on the long-list which more than 50% of the population designated necessary were counted as socially perceived necessities and a comparison of items which they already possessed with items they wanted but could not afford provided an index of deprivation (Mack and Lansley, 1985).

Within the framework of inclusion/exclusion, Levitas analysed this approach in terms of her RED (redistributive) paradigm, where poverty is seen as reducing a person’s opportunities to participate in society (Levitas, 1998). The “necessities” incorporated into the survey acknowledged contemporary behavioural norms and, after Adam Smith’s proverbial linen shirt, included ability to afford new rather than second-hand clothes and ability to celebrate special occasions (Mack and Lansley, 1985).

The Breadline Britain methodology also attempted to address a criticism of Townsend's work: lack of distinction between those who could not afford a particular item and those who simply did not want it (Gordon & Pantazis p.13). As well as seeking majority consensus on their selection of indicators, Mack and Lansley attempted to "control for taste" by using statistical analysis to test whether the relationship between income and claiming not to *want* (rather than being unable to afford) any of the 35 given items/ activities was comparable across their poorest, middle and top income brackets (*ibid.*, pp.92-99). Ultimately, they assessed deprivation in terms of an enforced lack of three or more socially perceived necessities.

The second *Breadline Britain* survey took place in 1990 (Gordon and Pantazis, 1997). Both the surveys, following similar methodology, served to quantify deprivation in terms of the number of people unable to attain goods or undertake activities that the general population considered to be something that all adults should be able to afford, developing Townsend's approach by adopting a consensual definition of what items and activities constituted necessities and by including an option to state that a particular item or activity was not undertaken through choice rather than because of affordability (Pantazis' 2006 conclusion).

The second survey worked with 44 socially necessary items/ activities selected following a survey of 1831 adults (*ibid.*, p.3), and extending the orientation towards normal social participation using an additional section on the perceived importance of access to and an adequacy assessment of 11 different public services. Bramley (1997) analysed this data in terms of the role played by local government in alleviating poverty. An analysis of occupational class, equivalised household income and deprivation indicated a "pro-rich bias", where wealthier households made 20-50% more use of leisure opportunities (*ibid.*, p.197).

The “millennium” PSE survey, conducted over 1998 and 1999 was undertaken by a team from four universities, in conjunction with the ONS. It employed data from the General Household Survey (GHS) and the ONS Omnibus Survey, supplemented by additional questions to update the Breadline Britain surveys, which were given to a representative sub-sample (Gordon *et al.*, 2000). Although designed to be compatible with the previous Breadline Britain research and so employing similar methodology, the 1998/9 PSE survey was the first to operationalise social exclusion empirically using primary data (Gordon *et al.*, 2000). It took a more overt perspective on poverty and deprivation as phenomena dividing individuals and households from a social mainstream, and explicitly framed deprivation in terms of social exclusion. The originality here involved defining exclusion from social relations as constitutive of exclusion, rather than merely as an indicator of deprivation resulting from poverty (Pantazis *et al.*, 2006, p.8). The PSE survey identified four dimensions of exclusion:

- Impoverishment (exclusion from adequate income or resources)
- Labour market exclusion
- Service exclusion (exclusion from public or private services)
- Exclusion from social relations

(Gordon *et al.*, 2000, pp.54-67)

The list of essential services included bus services and access to train or tube stations and petrol stations; exclusion from social relations included indicators of social, civil and political participation, social support, social contact and confinement (Gordon *et al.*, 2000, pp.54-67; Levitas *et al.*, 2007, p.56).

Focus groups were used to further inform the selection of social necessities and respondents invited to specify whether choice or lack of income were determining factors in whether certain items/ activities were purchased. The Gordon *et al.* report emphasised the latter three dimensions of exclusion (as distinct from poverty itself), and highlighted in particular those concerning exclusion from social relations (*ibid.*). Levitas, who has been intensely critical of narrow interpretations of social exclusion in both UK and EU policy, manifested by a predominant focus on labour market exclusion (2006), praised the survey, drawing attention to questions on:

- unpaid caring responsibilities;
- contact with friends and family;
- social support;
- participation in civil and political activities;
- debt and exclusion from financial services;
- crime and harm;
- health and disability (from Levitas *et al.*, B-SEM, p.55)

3.2.2 Dimensions, Thresholds and the Bristol Social Exclusion Matrix

In a compilation for the ESRC Research Centre for the Analysis of Social Exclusion, Burchardt *et al.* observed “interpretations of the term ‘social exclusion’ are legion” (2002, p.30). Equally, this brief overview of major surveys in the UK that have informed current understanding of how poverty, deprivation and exclusion can be quantified, demonstrates that potential criteria using which inclusion/ exclusion might be quantified are

equally abundant. The surveys above can be considered to illustrate a trajectory, gradually accommodating the idea that employment and household income only measure social exclusion indirectly (Pantazis, p.8); emphasis has gradually shifted from possession (of goods) to participation (in society). Leaving aside, temporarily, the vexed question of issues of taste or choice in participation, this approach rests on defining dimensions of inclusion and, further complicating matters, determining thresholds, above which lie either acceptable levels of (or opportunities for) participation.

To date, the most extensive framework for quantifying social exclusion in the UK is provided by the Bristol Social Exclusion Matrix (B-SEM), developed by Levitas *et al.* (2007) for the Department of Communities and Local Government (DCLG) and the Social Exclusion Task Force (SETF; 'SEU' when the report was commissioned). The B-SEM is distinctive in that the researchers initially worked *from* theoretical conceptions of inclusion/exclusion towards a means of operationalising the framework; previously, empirical analyses of exclusion were undertaken by adapting available data to operationalise a concept of inclusion/exclusion (Levitas in Pantazis *et al.*, 2006) (Table 3.1).

The B-SEM was created following an extensive review of different conceptual frameworks from both wider academic sources and policy literature, including indicators and surveys informing quantitative research. This framework was then applied to a wide range of available datasets and the data mapped on the domains and sub-domains of the matrix. The matrix itself comprises a total of ten dimensions, stratified into three main domains with ten sub-domains which can be applied to existing secondary datasets in order to quantify a concept of social exclusion.

Table 3.1 The Bristol Social Exclusion Matrix Domains
Source: Levitas et al. (2007) Chapter 6 pp.1-2

Domain Area	Domains (<i>dimensions of social exclusion</i>)	Sub-domains (<i>topic areas</i>)
Resources	Material/economic resources	<ul style="list-style-type: none"> • Income • Home ownership • Possession of necessities
	Access to public and private services	<ul style="list-style-type: none"> • Public services • Utilities • Transport • Private services • Access to financial services
	Social resources	<ul style="list-style-type: none"> • Institutional separation from family • Social support (affective and instrumental) • Frequency and quality of contact with family members/ friends/ co-workers
Participation	Economic participation	<ul style="list-style-type: none"> • Paid work • Providing unpaid care • Unpaid work • Nature of working life • Quality of working life
	Social participation	<ul style="list-style-type: none"> • Participation in common social activities • Social roles
	Culture, education and skills	<ul style="list-style-type: none"> • Basic skills (literacy, numeracy, English language) • Educational attainment • Access to education • Cultural/ leisure activities • Internet access
	Political and civic participation	<ul style="list-style-type: none"> • Citizenship status • Enfranchisement • Political participation • Civic efficacy • Civic participation
Quality of life	Health and wellbeing	<ul style="list-style-type: none"> • Physical health and exercise • Mental health • Disability/ Life satisfaction • Personal development • Self-esteem/ personal efficacy • Vulnerability to stigma • Self-harm and substance misuse
	Living environment	<ul style="list-style-type: none"> • Housing quality • Homelessness • Neighbourhood safety (including traffic, atmospheric pollution and noise pollution) • Neighbourhood satisfaction • Access to open space
	Crime, harm and criminalisation	<ul style="list-style-type: none"> • Objective safety/ victimisation • Subjective safety • Exposure to bullying/ harassment • Discrimination • Criminal record • Anti-social behaviour orders (ASBO) • Imprisonment

The array of areas, domains and sub-domains collated in the B-SEM recall Byrne's critique of the selection and measurement of dimensions as a highly contingent process (2005). Furthermore, the B-SEM indicates the scope for interaction between different aspects of inclusion/ exclusion. Along with Barnes (2005), Levitas *et al.* criticise approaches which use "batteries of single indicators" failing to differentiate between those identifying social exclusion (outcomes) and those increasing the probability of that outcome occurring (risk factors) or, as in *Opportunity for All*, do not provide a mechanism for prioritising one indicator or area where intervention might be targeted over another (2007, p.13).

3.2.3 Transport and Travel Within An Inclusion/ Exclusion Framework

Litman's categorisation of factors relating to transport and travel that impact upon the social inclusion reveal mobility and accessibility are fundamental aspects of social participation: age and physical ability; location and land use; the quality and quantity of travel options; or availability and willingness to use mobility substitutes all affect scope for participation in myriad activities (2003, p.6). Nevertheless, transport and travel have played a surprisingly modest role in the major surveys geared towards understanding disadvantage¹¹. *Poverty in the United Kingdom* assessed individual or shared car ownership only insofar as it constituted an asset, as might other forms of property or savings (p.202). However, with the development of consensually generated indicators in the Breadline Britain surveys, the profile of transport increased. Falling below the 50% threshold for acceptance as a socially perceived necessity, only 22% of the sample agreed that a car was necessary (p.54).

¹¹ Litman also notes that qualitative evaluation techniques might prove particularly appropriate to understanding the social impacts of transport policy and planning practices, since these impacts tend to be difficult to quantify (2003).

Mack and Lansley also found that 88% of respondents classed ability to afford “public transport for one’s needs” as necessary. Even of those who did not themselves feel that they need public transport, 78% thought that everyone should be able to afford it (p.54; pp.78-9). Notably, an opinion about whether someone can afford public transport bears no relation to actual provision. For the second Breadline Britain survey, bus services were amongst the 11 local services on which respondents were invited to comment. Data were collected on: whether the respondent used bus services and if so, their adequacy; respondents who did not use the bus services were asked whether services were unavailable/ inadequate, they could not afford to or the service was not relevant. All respondents were also asked to classify frequent and regular bus services using the options essential, desirable and don’t know (Bramley, 1997, p.194, pp.283-284). Although 27% of respondents selected the don’t use/don’t want/not relevant option on for their own bus use, 96% classified frequent and regular bus services as essential whilst 20% considered them desirable (pp.283-284). Based on further statistical analysis, Bramley concluded that, of the general services supplied by local government, the public bus service was uniquely more liable to benefit middle class rather than multiply deprived households, particularly those without a car (p.211). As social norms have changed, these figures have also changed: the 1990 survey placed having a car at 26% (Gordon & Pantazis, 1997). By the time of the PSE survey, 38% of respondents thought that a car was necessary and 49% thought it desirable (3% responded ‘don’t know’) (Pantazis *et al.*, 2006, p.95).

The collection as well as the analysis of the data above demonstrates that the role of transport and travel within conceptualisations of disadvantage has modulated since the advent of social exclusion as a policy discourse. However, although the relativist approach to understanding disadvantage has provided a quantification of the extent to which car ownership has become a social necessity, empirical interest in the significance of

mobilities in relation to the wider concept of social inclusion/exclusion has not kept pace with theoretical developments.

Using the British Household Panel Survey (BHPS) and the European Community Household Panel (EHP), Barnes has deployed perhaps the most sophisticated operationalisation of inclusion/exclusion to date in order to quantify social exclusion levels across 12 European countries (2005). Both British and European analyses are conducted using a framework conceptualising exclusion across 7 dimensions. Using factor analysis, these dimensions were grouped under three different headings, indicated in Figure 3.1.

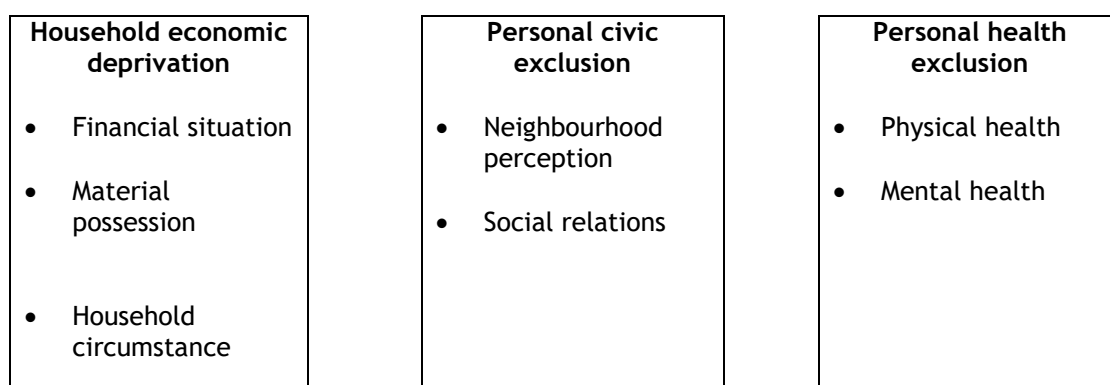


Figure 3.1 Barnes' Classification of Exclusion Following Factor Analysis (2005, p.69)

Drawing from Walker, Barnes defines social exclusion as “the multi-dimensional and dynamic process of being shut out, fully or partially from the economic, social and cultural systems that determine the social integration of a person in society” (Barnes, 2005, p.15). However, the research is conducted only with reference to the working age population, recalling criticism that policy understandings of inclusion/ exclusion tend to over-rely on paid employment as an integration mechanism (Levitas, 1998)¹².

¹² Levitas *et al.* have further criticised the Barnes analysis for treating labour market position as a risk factor in, rather than an outcome of, exclusion (2007, p.75).

Mobility in the sense of physical impairment is recognised within this framework, as Barnes operationalises an indicator designed by Berthoud (2000). However, there is no direct recognition that transport and travel might play a part in social integration. The ECHS component of the research seems to begin with a traditional income proxy approach to car ownership, initially listing a car or van alongside items such as a microwave oven and dishwasher, as a potential indicator of inclusion/ exclusion along the material possessions dimension. However, for reasons which are not made clear, it does not pass the validation process and car ownership is dropped as a sub-component of the indicator (pp.146-151).

Again due to considerations tangential to the issue of mobility, the car makes an appearance within the neighbourhood perception indicator (see Table 3.2).

Table 3.2 Barnes and Neighbourhood Exclusion, 2005, p.49; p.147

	Great Britain Analysis	EU Analysis
Definition of disadvantage	wanting to move because of one of the following	Score below 60% of median on weighted score from index where household suffers from
Sub-components of neighbourhood perception indicator	<ul style="list-style-type: none"> • Traffic • Area unsafe • Noise • Unfriendly area • Dislikes area • Feels isolated 	<ul style="list-style-type: none"> • Noise from neighbours or outside • Pollution caused by traffic or industry • Crime or vandalism in the area

The issue of mobility might be considered even more obliquely present in the social relations indicators for both studies, although manifesting different perspectives on the importance of social contact. The Great Britain study takes a social support perspective, questioning whether the respondent lacked: someone to listen when they need to talk, someone to count on for help in a crisis, someone to totally be themselves with, someone they feel appreciates themselves as a person, someone to count on for comfort when they are very upset (p.50). The EU research adopts a

more social capital approach, investigating frequency of seeing friends/relatives, how often people speak to neighbours, and whether they are members of a club or organisation (p.147).

Barnes' findings on personal civic exclusion indicated that, *of the working age population*, the unemployed, lone parents and the physically ill were most likely to be disadvantaged on that dimension. At this stage, he theorises inability to meet others due to the responsibilities of having children and "lack of mobility" as likely reasons for this exclusion, although these ideas are not further developed (2005, p.87). His analysis also notes that "having a full time job also suggests the avoidance of widespread forms of disadvantage", such as being excluded on all of the integral elements of social exclusion shown in Figure 3.1.

Although differing in selection of dimensions and threshold cut points, Barnes' approach extended earlier research using the BHPS conducted by Burchardt *et al.* (1999)¹³. Following their initial investigation of social exclusion in Britain, Burchardt *et al.* developed a longitudinal model, covering 1991-1998, defining inclusion/exclusion along four dimensions (see Table 3.3).

As with Barnes' research (*ibid.*), the study is conducted in relation to the working age population. As such, over the eight years analysed, it finds:

- From 15 to 17% of the sample excluded on the consumption dimension
- From 12-14% of the sample excluded on the production dimension
- From 17-21% of the sample excluded on the political engagement dimension

¹³ Burchardt, T., Le Grand, J. and Piachaud, D. (1999) "Social Exclusion in Britain 1991-1995" *Social Policy and Administration* 33 (3) pp.227-244

- From 9-12% of the sample excluded on the social interaction dimension (p.35)

Table 3.3 Burchardt *et al.* Dimensions of Exclusion (2002 pp. 31&34; 42 & 43)

Dimension	Definition	Inclusion/exclusion threshold
Consumption	The capacity to purchase goods and services	Under half mean annual equivalised income
Production	Participation in economically or socially valuable activities	Self-employed, employed, retired at or over state pension age/maternity leave, family care, full time student or training/unemployed, long term sick or disabled, retired below state pension age, other unspecified status
Political Engagement	Involvement in local or national decision-making	Member of any of political party, trade union, parents', tenants' or residents' association, or voted in the last general election/none of the above
Social Interaction	Integration with family, friends and community	Has social support in terms of someone to listen when they need to talk, someone to count on to help them in a crisis, someone to totally be themselves with, someone they feel appreciates themselves as a person, someone to count on for comfort when they are very upset/lacking social support in one of these respects

With specific reference to the most recent wave (1998 data), they found that 57.5% of the sample of working age adults experienced no exclusion on any dimension, whilst 30.1%, 10% and 2.3% experienced exclusion on 1, 2 and 3 dimensions respectively. Under 1% of the sample was simultaneously excluded on all four dimensions (*ibid.*, pp.35-36). The researchers also noted that connections between exclusion on any given dimension over time were stronger than associations between the different dimensions, concluding that each dimension picked up “different kinds of people” (p.36).

3.2.4 Summary

Although previous attempts to operationalise social inclusion as a concept have included spatiality, the focus has been on quality of residential environment and the presence of amenities (Barnes, 2005; Gordon *et al.*, 2000). More often, car ownership is subsumed under dimensions reflecting material wealth, obscuring the car's role as an aid to mobility and in participating in other dimensions of social inclusion. Burchardt *et al.* (2002) present a relatively simple framework for understanding social inclusion, which has the virtue of clearly centring on participation as a fundamental aspect of the paradigm pinpointed in Section 1.2.3 above: participation or non-participation in the normal range of social activities. Furthermore, the potential role of physical mobility in facilitating participation is also implicit in each dimension they use.

3.3 Transport Exclusion and Car Dependence

Church *et al.* (2000) define approaches to analysing inclusion/ exclusion as either categorical or spatial; due to the constraints of sampling methodology, studies that aim to be nationally representative have tended to be aspatial, and travel and transport have played a relatively minor role in attempts to operationalise inclusion/exclusion. This is problematic for two main reasons. Firstly there is the issue of transport exclusion: research from what might broadly be termed a transport geography perspective has necessarily included the spatial dimension, clearly demonstrating that problems with mobility and accessibility inhibit full social participation. Secondly, the issue of car dependence remains tacit in relation to these inclusion/exclusion frameworks; access to private transport does not necessarily render the relationship between transport and social inclusion unproblematic.

3.3.1 Mobility and Inclusion/ Exclusion

Kenyon *et al.* (2002) define mobility-related exclusion as:

“The process by which people are prevented from participating in the economic, political and social life of the community because of reduced availability to opportunities, services and social networks, due in whole or in part to insufficient mobility in a society an environment built around the assumption of high mobility” (pp.210-211).

This focus on process recalls inclusion/exclusion discourse rather than the concept of deprivation, as is their attribution of the problem of mobility-related exclusion to “the *assumption* of high mobility” (*ibid.*; emphasis added). The latter phrase also neatly accommodates the concept of accessibility, locating a requirement for high mobility as a failure of systems rather than individual deficiency.

Although the framing of mobility as a dimension of inclusion/ exclusion is sometimes less explicit, there is a well-established literature on what might be termed *transport exclusion* or *disadvantage*, addressing the links between transport and social exclusion (see Hine and Mitchell, 2003; Lee and Murie, 1999; Lucas, 2004; Turner and Grieco, 2000).

However, having introduced a spatial component into understandings of inclusion/exclusion, both scale and distribution are problematic. Despite the conceptual challenges of defining rural and urban, the practice of research has tended to bifurcate between these two poles. The rural research orientation has emphasised the challenges of social and economic participation in the face of infrequent or expensive transport services; households without access to a car face greater costs of time, money and effort to reach their destinations (DETR, 2000c). In rural areas particularly, even for those *with* access to a car, the related phenomenon of transport poverty, where the relative necessity for mobility can make car ownership a cause of deprivation rather than the more conventionally imagined

symbol of affluence, is a particular concern (Chapman *et al.*, 1998; Farrington *et al.*, 1998). Nevertheless, endorsing demand-responsive transport (DRT) as one of several possible solutions to the difficulty of supporting mobility in areas of widely dispersed populations, Gray *et al.* emphasise that car-based mobility has mostly been associated with increased choices and opportunity for those in rural areas, maintaining that “it is difficult to overstate the importance of the motor car in shaping and underpinning rural life in the early 21st century” (Gray *et al.*, 2008, p.108).

The car’s urban role is also ambiguous: the commons problem that a gain in personal mobility through the use of a private car reduces the functionality of the network as a whole (Goodwin, 1999); *high* levels of car use contribute to a form of transport disadvantage and certainly congestion remains a focus for considerable policy attention. However, within an urban framework, research has tended to pursue what Church *et al.* (2000) define as a *category* rather than a spatial approach, focusing on groups who are perceived to face particular challenges. Analysing transport and exclusion in urban Scotland, Hine and Mitchell identify low-income groups, women, older people, disabled people and children as more likely to experience transport disadvantage (2003, pp.13-21). Collectively these high risk groups account for well over half the population; they are also co-incident with groups less likely or unable to drive, and more likely to suffer from income deprivation.

Using a pseudo-panel with Family Expenditure Survey (FES) data to estimate the relative sensitivity of car ownership to changes in motoring costs between urban and rural areas and controlling for income (proxied by total household expenditure), Dargay found that whilst changes in fuel cost had no significant effect in rural areas, a small effect was observed in urban areas. However, considering car purchase costs, the elasticity of car ownership in urban areas was double rural levels (2002). Urban areas were defined as Greater London, Greater Manchester, Merseyside, West and

South Yorkshire and the Central Clydeside Conurbation; districts with less than 7.9 persons per hectare were counted as rural; whilst those remaining with over 7.9 persons per hectare were classified as “other”. Dargay concludes that the greater price sensitivity in urban areas supports the view that area-based interventions such as tolls and congestion pricing are the most appropriate TDM tools, as untargeted increases in the cost of car transport “would pose a considerable economic burden for rural households” (*ibid.*, p.363).

In later work, using the BHPS, Hanley and Dargay used a dynamic discrete-choice model to confirm the hypothesis that state-dependence is a significant factor in household car ownership (2000). Additional to income (real net household income) and demographic factors, spatial variables were also included in the final model. Four regional dummies, created for Greater London, Scotland, Wales, and the six former metropolitan English counties, were tested in relation to a category representing the relatively rural English shire counties; population density data for local authority areas was also included in an attempt to capture differences in car ownership between households in different areas. The regional dummies were only significant for London and Scotland, although Hanley and Dargay include data on the change in probability of car ownership at various levels (see Table 3.4).

Table 3.4 Regional Variations in Probability of Car Ownership

Source: Hanley and Dargay (2000, p.13)

	Change in Probability 0 cars	Change in Probability 1 cars	Change in Probability 2 cars	Change in Probability 3 cars
London	0.04	-0.02	-0.02	-0.00
<i>Metropolitan (results not significant)</i>	0.03	-0.01	-0.02	-0.00
<i>Wales (results not significant)</i>	0.02	-0.01	-0.02	-0.00
Scotland	0.06	-0.03	-0.03	-0.00
Population Density	-0.0009	-0.0003	-0.0005	-0.0000

The authors note that mean income in Scotland is in the middle range of British incomes and then observe that moving from the Shires to Scotland produces the greatest increase in the probability of a household lacking cars. Within this context, their description of the 6% figure as “unsurprising” is somewhat confusingly justified by the tautological explanation that “mean car ownership in Scotland is lower than in the rest of Britain” (p.12).

Lack of clarity in the interplay of income and urbanisation as determinants of car ownership notwithstanding, the greater range of alternative modes available in urban areas does not nullify transport exclusion as a concern. Examining links between social exclusion and transport on behalf of London Transport, in response to policy interest in transport and social exclusion, Church and Frost (1999) designed a seven-category conceptual framework incorporating a spatial dimension which also recognised individual/household constraints at a journey’s outset and the organisation of activities at the destination point as well as the nature of the transport system (Table 3.5).

**Table 3.5: Conceptual Framework for Social Exclusion and Transport
From Church and Frost (1999)**

Dimension of Transport Exclusion	Summary Explanation
Physical	Physical and psychological barriers relating to the accessibility of the built environment and transport system
Geographical	(Both urban and rural) peripherality and consequent poor transport provision
Facilities	Land-use trends and a move towards centralised services in conjunction with time/income constraints can leave those without a car in facilities exclusion
Economic	The financial (and time) costs involved in travelling to or even seeking work can inhibit labour market participation
Time	Household structure, particularly for those with caring responsibilities, along with transport network limitations can impose an excessive time burden, restricting mobility
Fear	Social characteristics, especially gender, powerfully influence the use of transport and public space
Space	In some cases, especially with the young, surveillance and security arrangements can contribute to exclusion from transport and related public spaces

The existence of alternatives to car travel should not be conflated with the acceptability of those alternatives. Stradling *et al.* collected 1,016 questionnaire responses distributed to households in 8 areas of Edinburgh evaluating the effects of real time passenger information on Quality Bus Corridors (2004). Following factor analysis, the baseline results of the survey were published under the title “Eight reasons people don’t like buses” (see Table 3.6).

Table 3.6 Eight Reasons People Don't Like Buses

Source: Stradling et al. (2004)

Factor	Heading	Examples
1	Problems with service provision	Inconvenient route, scheduling, lack of direct route
2	Unwanted arousal from journey experience	Unwelcome intrusions/ interruptions to the travel experience such as discomfort or lack of space
3	Feeling unsafe	Waiting for buses, especially at night, intimidating or drunk passengers
4	Need for autonomy/ control	Lack of control in comparison with driving
5	Cost	Expensive fares
6	Self image	Travelling by bus does not create the right impression
7	Preference for independence	I'd rather walk
8	Disability and discomfort	Insufficient hand rails inside bus

Similarly damning, Bradley summarised:

“It is not surprising that buses are used more by poorer households because such households are less likely to have use of a car, let alone more than one car [...] Buses may be regarded as a cheaper, slower, lower quality mode of transport, which better-off people tend to choose to avoid if they can” (in Gordon and Panzakis, p.197).

Kenyon *et al.* outline the disadvantages of *all* modes other than the private car, summarising “low levels of service off-peak, poor facilities and accessibility of at interchanges and onboard, the public transport environment and the cost of public transport”, adding that “non-motorised mobility can be time consuming, unsafe and unhealthy” (2002, p.211).

3.3.2 Car Dependence

Zhang concisely defines the idea of car dependence as:

“the probability that a traveller has the automobile as the only element in the choice set of travel modes.” (2006 p.311)

However, the Church and Frost transport exclusion framework (see Table 3.5) demonstrates that even within urban areas, which offer a greater array of transport possibilities, the choice set of travel modes is limited by factors other than the presence or absence of vehicles and infrastructure.

The choice set is at least partially determined subjectively, pivoting between perceptions of necessity and desirability. The car’s desirability seems to contrast markedly with the association of other modes with relative poverty, inconvenience and risk. Controlling for generational and life-cycle effects, patterns of car ownership in relation to household income exhibit an asymmetric relationship, responding more quickly to rising than to falling incomes (Dargay, 2001). This asymmetry could be understood in terms of literature indicating the role of habit, rather than daily rational choice, in transport decisions (Aarts *et al.*, 1997, Aarts & Dijksterhuis, 2000; Bamberg *et al.*, 2003). Dargay theorises the experience of car ownership as a pivot point between regarding the mode as necessary instead of merely desirable:

“The acquisition of a car is seen as a luxury, but once acquired [it] becomes a necessity so that disposing of [it] is much more difficult” (2001, p.819).

A more fully developed theoretical framework for conceptualising car dependence constructed by Farrington *et al.* distinguishes between conscious and structural car dependence (1998). Conscious dependence refers to people who could employ other modes but, for whatever reason, prefer car travel; structural dependence refers to absence of modal choice.

In terms of social inclusion, structural car dependence can be considered the key issue, insofar as quality of access determines opportunities for participation in various economic and social activities. However, there is a potential conflation of structural and conscious dependence, as transport behaviours are necessarily shaped by the transport options available (Goodwin, 1991) - or *perceived* as available. Thus, investigating the possibility of social inclusion without the car requires an analysis of both structural and attitudinal factors. The following sections summarise research evidence which suggests that the desirability of car travel is not as uncontested as might be thought.

3.3.3 Car Dependent People

There is a strong behavioural strand in transport psychology, which considers attitudes towards transport as an important determinant of travel choices (Anable et al., 2004; Steg, 2005, Stradling 2003 and 2004a, Kitamura *et al.*, 1977). Car ownership has been demonstrated as providing psychosocial benefits beyond the more traditionally understood advantages of access to employment, goods and services; people will make considerable financial sacrifices to retain a household vehicle. Dargay's research on income's asymmetric effect on car ownership (2001) might be a function of any combination of these factors, as well as of the role of habit in modal choice.

However, positive experience of car ownership and use and negative experience of public transport is not universal. Stradling *et al.*'s research on the experiences of bus users also found that using public transport was an attractive experience because it offered opportunities to interact with and observe other people (2004). Respondents invoked community, mixing, conversation, meeting different types of people, friendliness and sociability, expressing enjoyment of these personally and at a passive level, listening or watching others (p.8).

Surveys commissioned by the Scottish Executive in 2001, 2003 and 2005 studied travel behaviour and attitudes. Arising from this work are various strands suggesting that car use might not be as deeply embedded as hitherto assumed.

Very few people (3% of respondents in a representative survey covering Scotland) are mono-modal, always using the same mode of transport (Stradling *et al.* 2004b). Indeed, qualitative research has explored the phenomenon of *driving avoidance behaviour*, where people able to drive voluntarily restrict car use, anticipating problems such as stress, difficulty parking or heavy traffic (Stradling, 2005).

Finally, segmentation research carried out by Dudleston *et al.*, categorises just over 45% of current drivers as either *malcontented motorists* or *aspiring environmentalists*, unhappy with their current car use (2005).

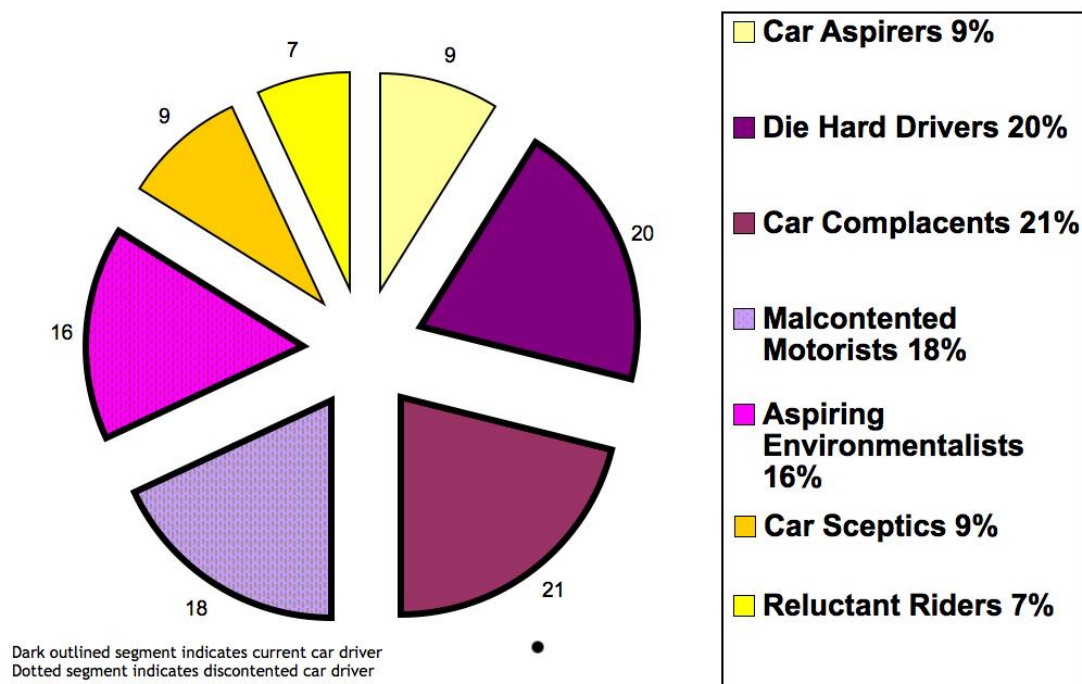


Figure 3.2 Segmentation Analysis of Driver Types
Source: Dudleston *et al.* (2005)

Although 20% of the sample ranked as *die hard drivers*, in total, research on car dependent people suggests that conscious car dependence is less deeply embedded than might be assumed. However, as Schwanen and Mokhtarian remind us, attitudes do not necessarily translate into behaviour (2005).

3.3.4 Car Dependent Trips

“Why do we move around at all? Because we can, because we have to, because we *like* to...” (Stradling 2006, p.1: emphasis added)

The conventional wisdom of transport geography states that travel is a derived demand; it is a utility-maximising behaviour, directly linked to the demand for urban activities (Munshi, 1993). As such, trips are analysed in terms of their primary purpose; some trips, such as to the supermarket, are generally more car-dependent than others (see Section 2.2.1). Transport psychology, considering affect as a motivating factor in decisions to travel and selection of mode also has implications for the idea of the car dependent trip, questioning the universality of the “derived demand” contention (Mokhtarian and Salomon, 2001; Steg, 2001; Mokhtarian, 2004). Consideration of the role of affective factors - such as stress, control, freedom, relaxation and excitement - alongside traditional instrumental considerations of cost and convenience has produced some intriguing results. Researching attitudes towards both work and leisure trips, Anable and Gatersleben (2005) find paradoxical results in terms of how well respondents rate the car on both instrumental and affective factors and its status as the dominant mode for most journey types. Although the majority of interviewees were car users for both trip types, cars did not always score most highly on all the instrumental or affective factors. Indeed, the active travel modes (walking and cycling) were perceived to score as well as or better than the car for both sets of factors.

Although some trips will remain difficult to manage without car transport, even in a well-served urban setting, this research indicates potential for reduced car use for some trips; in the right circumstances, other modes can be a positive choice rather than poor relations of the car.

3.3.5 Summary

Considering existing knowledge about the potential for lowering levels of car ownership/use, both income and, to a lesser extent, urbanisation are generally accepted as determinants of car ownership. Car ownership has been demonstrated as providing psychosocial benefits beyond the more traditionally understood advantages of access to employment, goods and services; people will make considerable financial sacrifices to retain a household vehicle. Dargay's research on asymmetry in the effect of income on car ownership (2001) might be a function of any combination of these factors, and of the role of habit in modal choice. The status of the car as a competitive mode in relation to other travel choices, including walking, and the complexity of the phenomenon of car dependence (conscious and structural), combine, adding impetus to the debate about the balance between travel as a derived demand, and something enjoying intrinsic utility.

However, there has been no quantitative analysis relating different dimensions of the social inclusion paradigm to car ownership and so separating out the relative importance of different dimensions of inclusion for private car transport. Although transport disadvantage has been conceptualised as intrinsically a dimension of social inclusion, the stress has been placed firmly on the challenges of lack of access to transport (Farrington *et al.*, 1998; Gaffron *et al.*, 2001; Gray *et al.*, 2001, 2006; Grieco *et al.*, 2000; Hine and Mitchell 2001, 2003; Lucas, 2004) rather than understanding the car's specific role, or any positive impacts upon the wider concept of social inclusion arising from modal choice. However, as

this research has an urban focus, aiming to develop understanding of how car ownership and use relate to social inclusion, transport exclusion will not be considered as a separate dimension. Rather, other aspects of inclusion will be analysed within the context of car use. The potential for having social inclusion without the car is demonstrated by a review of literature on car dependence, assessing the parameters of car dependence in various contexts.

3.4 Driving and the Compact City

The tenor of sustainability policies, particularly the urban renaissance agenda, points to the compact city hypothesis as a win-win scenario of decreased levels of driving alongside increased levels of social interaction. However, the evidence base concerning housing and mobility issues related to the compact city hypothesis problematises this picture along two important axes. Firstly, the relationship between the compact city and levels of car ownership and use remains contentious. Secondly, although research interrogating the compact city hypothesis has substantiated some of the theoretical benefits of urban compaction, this is not without qualification. A wider framework considering the issues of choice and aspiration into account extends the question of whether there is empirical grounding for the normative vision of the urban renaissance to one of *ownership* of that vision.

3.4.1 The Compact City, Car Ownership and Use

Much of the considerable empirical work drawing on the compact city debate correlates urbanisation with lower levels of car ownership/use. Most notably, Newman and Kenworthy's extensive city analyses indicating that per-capita transport energy use decreases as city size increases and that high density, mixed-use urban environments can support effective public transport, holding levels of car use steady even where ownership

increased (Newman and Kenworthy, 1989, 1999; Newman, 1992). Notably, this relationship is mediated by public transport availability; there is no *necessary* link between compaction and a good public transport service and compaction of itself can exacerbate problems in a car-reliant city (Bae, 2004). Within urban areas, discontinuous streets which do not link to main arteries are also inaccessible to public transport and roads designed for heavy traffic discourage walking and cycling (see Table 3.7).

Table 3.7: Automobile and Multi-Modal Accessibility
From Litman, 2005

Scale	Auto-Oriented	Multi-Modal
Building or site	Located on major highway, generous parking in front or beneath buildings.	Located near transit and other services, building connects to sidewalk, good walking/cycling facilities.
Block or neighbourhood	Wide roads and generous parking. Scattered destinations. “Strip” development.	Clustered development. Narrow roads with traffic calming. Good walking/cycling facilities. Good local transit.
Municipal or community	Moderate to low-density development patterns. Wide roads and generous parking requirements.	Clustered development. Good local transit. Bicycle routes. Transportation management programs.
Regional	Moderate to low-density development patterns. Generous highway capacity.	Clustered development. Good regional transit. Bicycle routes. Transportation management programs.
Interregional	Generous highway capacity. Good air travel service.	Good interregional bus/rail service. Good air travel service.

Although the relationship between urban form and car ownership/use is complex, several elements of the compact city hypothesis are supported by empirical research. Considering inclusion - the ability to participate in/access desired opportunities - as pre-requisite to a sustainable urban environment, Burton's research on the compact city's social ramifications is also relevant in demonstrating that urban areas, the bulk of human habitation, need not be car dependent. Taking a social perspective on the compact city, Burton enthuses about the scope for reduced car dependency in an urban renaissance based on higher density, mixed use developments built on brownfield sites near transport nodes (2003). During a large scale study of the relationship between urban compaction and social equity, she operationalised a concept of social justice using 12 different equity effects, and 41 indicators to proxy density, mix of use and urban intensification (2001). Within this framework, households without car access appeared as a component of the "segregation" equity effect. Regression analysis demonstrated mixed evidence in support of the compact city, furthermore showing that different equity effects were related more closely to different proxies of compaction (Table 3.8).

Of the benefits listed in Table 3.8 overleaf, Burton notes that improved public transport use is most significant and that overall, cities with a high proportion of flats and terraced houses and a low proportion of detached and semi-detached houses appeared to be the most supportive of social equity, in that they improved the relative position of the poor (2001, p.13).

Burton's research suggests that compaction can support a desirable and therefore socially sustainable urban environment and with regard to public transport use, walking and cycling accord with the urban renaissance ideal of reducing car use.

Table 3.8: Urban Compactness and Social Equity effects

Aspect of Compactness	Significant Positive Relationship with Equity Effect
Density	(Improved) access to superstores (Increased levels of) public transport use Lower death rates from mental illness ¹⁴ Less social segregation
Mix of use	(Increased levels of) walking and cycling (Higher levels of) general health (Greater) Job opportunities
Intensification	(Reduced) social segregation (Greater) Job opportunities

Source: Burton (2001)

However, debate persists regarding the mechanisms through which urban density and decreased driving inter-relate. Handy in particular criticises the assumption that this association can provide a lever in promoting modal shift (1996). Nevertheless, more recent survey research, including variables to control for travel attitudes and preferred neighbourhood characteristics, provided evidence that proximity to shops and services encouraged an increase in walking (Handy *et al.*, 2006). More tentatively, the authors indicated that evidence also exists that enhanced active travel opportunities, safety, neighbourhood attractiveness and socialising might also increase levels of walking (*ibid.*).

The Netherlands provide a very different governance framework from the US environment where the above analyses took place. Schwanen *et al.* examined the impact of national planning policies intended to influence individual travel behaviour (2004), concluding that strict compaction

¹⁴ Burton notes that this is a weak indicator (*ibid*, p.11)

policies had reduced the frequency and distance of car trips and stimulated public transport use, cycling and walking. In parallel, retail planning prohibiting out-of-town hypermarkets and shopping malls had also made a strong positive contribution to reductions in frequency and distance of car trips and additional cycling/walking. However, compaction had increased rather than decreased private car journey time (*ibid.*).

Further drawing on the behavioural strand of research analysing car dependency as a function of personality rather than place, Schwanen and Mokhtarian also conduct survey research in the San Francisco Bay Area, where around 2000 respondents provided information about their travel patterns, mobility constraints, lifestyles, personality, and attitudes to both travel and land use, as well as sociodemographic data (2005). On the basis of this, respondents were classified as one of: true urbanites; true suburbanites; mismatched or dissonant urbanites; mismatched or dissonant urbanites. Findings considered both modal choice and distance travelled with reference to these categories.

Car travel dominated in overall travel patterns, even in areas most orientated towards public transport alternatives. Mismatched urban residents travelled more than true urbanites and less than suburban categories. The authors found that respondents classified positive on a pro-environmental indicator exhibited a reduction in distance travelled by car, which appeared more important than neighbourhood dissonance type.

Within this US context, the *smarter choices* of walking, jogging and cycling are classed as “slow modes” (*ibid.* p.147). Both categories of urban respondent were most strongly associated with use of these modes, also covering larger distances by them than suburban counterparts. However, mismatched urbanites tended to cover shorter distances by these modes than true urbanites. Probability of bus and train travel follow a similar ranking, with true urbanites having the highest probability, mismatched

urbanites the next highest, followed by mismatched suburbanites then urbanites. Notably, the more vehicles a household has available reduces the probability of rail travel, and the more commuters like bus travel, the less likelihood of them using active “slow” modes.

Schwanen and Mokhtarian conclude that although residential self-selection affects relationship between land use and travel behaviour to a limited degree, mismatched urban dwellers, who would rather live in suburban areas, find it easier to realise their preferred transport choices than their mismatched suburban counterparts for whom “public transit services may not be compatible with lifestyle constraints” (2005, p.150).

3.4.2 Residential Choice and Travel Choice

The residential choice issue raised by Schwanen and Mokhtarian (*ibid.*) has important ramifications for the compact city hypothesis within the context of social sustainability. Burton herself notes that the urban renaissance must be made an attractive proposition, citing DETR research listing concerns about crime, noise, air quality, heavy traffic, nuisance from street parking and rubbish along with the quality of schools and the general appearance of the area (Burton, 2003; DETR cited in Burton 2003).

These concerns were previously framed in terms of choice or aspiration. Breheny has distinguished UK residential ideals from those in continental Europe, where “a profound fondness for suburban and semi-rural living” renders the urban renaissance ideal undesirable (1996, p.12). Newman and Kenworthy dismiss this as representing a “density is bad for you” or “Anglo-Saxon ‘pastoral’ or anti-urban tradition”(1989, pp.88-93). Research following the inception of a maximum parking provision standard of one space per dwelling in English housing found that even households without a car, or who only infrequently use a vehicle, valued the possession of a parking space and would be reluctant to give it up (Stubbs, 2002).

However, beyond the issue of perception, there is also substance to concerns about the desirability of the urban renaissance; considering the transport implications alone provides only a partial reading of Burton's (2003) findings. Compactness was also associated with (in descending order of significance):

- Less domestic living space
- Lack of affordable housing
- Poor access to greenspace
- Increased crime levels
- Higher death rate from respiratory disease¹⁵ (2003)

The “density debate” remains current, especially given the tension between providing affordable housing and supplying desirable housing (Whitehead, 2007; 2008). Well maintained greenspace, including trees, parks, bike paths and walkable areas, has been shown to benefit both physical and mental health (see O’Campo *et al.*, 2009 for findings and literature review). Within the context of the Scottish Health Housing and Regeneration Project (SHARP), the move from a flat to a house is associated with psychosocial benefits, ascribing improved well-being or mental health to changed environment (Gibson *et al.*, 2008).

3.4.3 Summary

Burton's findings can be seen as congruent with the wider body of literature associating higher densities with “smarter” travel choices. However, the fact that the research is situated within the context of the

¹⁵ This also is defined as a weak indicator (*ibid.*, p.11).

compact city and examining social ramifications invites a return of attention to two issues raised in the previous chapter. Burton's finding that different *aspects* of compaction influence modal choice relates to the question of at what scales empirical analysis of car ownership has taken place, whilst the evidence mix recalls the question of the (un)desirability of dense living environments.

3.4.4 Conclusions – The Empirical Context

The empirical context demonstrates that clarification is required regarding how urban form relates to social inclusion, and the car's role within that relationship. Density in relation to car ownership/use has most often been considered at macro level, with comparisons made at national, regional and city levels (Kenworthy and Laube, 1999). Furthermore, where the car appears in previous operationalisations of inclusion/exclusion, it is considered a-spatially, under the rubric of material goods rather than as a means of facilitating social participation through enhanced mobility.

Burton's research suggests that compaction can support a desirable and therefore socially sustainable urban environment (*ibid.*). However, psychologically informed research relating to both car ownership and residential choice highlights the issue of identity as determinant of travel choices: the idea that people are essentially "die-hard drivers" or "urbanites" and that these personality traits determine behaviour (see Sections 3.3.3 and 3.4.1). In this case, rather than acting as a lever for modal shift, urban compaction policies might only appeal to particular population segments, with lower car ownership/use in these urban environments representative of unsatisfied demand rather than the sought-after renaissance.

3.5 Developing Research Questions

This section reviews the research objectives and outlines how the research questions developed from the literature review process, briefly considering methodological implications.

Chapter 1 specifies the overarching aims of the research as:

- to evaluate the extent to which an urban renaissance might reduce levels of car ownership without inhibiting social inclusion
- to assess the potential for de-coupling rising family incomes from increasing levels of car ownership and use
- to identify robust strategies for reducing levels of car ownership and use without inhibiting social inclusion

Three objectives were specified in order to fulfil those aims:

1. To analyse how levels of car ownership relate to key dimensions of social inclusion and any intervening role of spatial scale in relation to car ownership and those different dimensions of social inclusion.
2. To theorise the mechanisms through which built form impacts upon car ownership and use by exploring the experiences of, and attitudes towards urban travel held by both driving and non-driving urban dwellers.
3. To investigate how these travel choices might relate to urban dwellers' perceptions of social inclusion or exclusion.

Considering the policy agenda in isolation, the aspiration of an urban renaissance appears to offer a dual win, presenting a scenario where high

levels of accessibility help to foster sustainable “smarter” travel choices without damaging social inclusion. An overview of both theoretical and empirical work on transport and urban form does confirm an inverse correlation between urban scale and car ownership levels, just as the contribution of attitudinal research to the understanding of modal choice establishes values, perceptions, sense of identity and habit as influencing travel decisions. However, Chapters 2 and 3 demonstrate both theoretically and empirically the complexity of that hope.

Nevertheless, particularly from the conceptual standpoint, a supporting theoretical framework is certainly behind this proposition. The compact city hypothesis, although most frequently interpreted in terms of environmental sustainability, is also intertwined with Jacobs’ urban theory where urban density supports social interaction and trust. Three major theoretical contributions from transport research also imply a challenge to the orthodoxy of the car as pre-requisite to full social participation. Urry’s development of the mobilities paradigm emphasises multiple forms of connectivity, eroding the primacy of physical travel as facilitating social participation. Secondly, Adams’ concept of hypermobility questions the normative perspective that greater mobility is necessarily beneficial, highlighting the stress that the *requirement* of high mobility levels puts on individuals, and its wider implications for increasing social polarisation. Finally, based on analysis pioneered by Mokhtarian, the concept of travel as a derived demand is reworked to include the idea of potential value in travel beyond the trip’s ostensible purpose.

These theoretical developments, involving respectively the necessity, desirability and qualitative experience of travel, problematise previously received wisdom about mobility’s nature and value and, consequently, about the car, for decades seen as its most adaptable servant. The dimensional aspect of the social inclusion/exclusion paradigm seems congruent with these new conceptions of mobility and positive urbanist

vision; within an urban framework, increased inclusion on dimensions of neighbourhood or virtual interaction could potentially be understood as alternatives to mobility manifested on a dimension representing inclusion in terms of car ownership.

However, this is only a partial interpretation of the theoretical and empirical framework within which the thesis is situated. Firstly, it overlooks the historical ambivalence of city visions, associated with crime, deprivation, isolation and alienation as well as with productive interactions between diverse businesses, cultures and peoples. Secondly, although research reveals that “the recognition that there is suppressed demand for the car has not been matched by the recognition that there is also a suppressed demand for public transport journeys” (Hine and Greico, 2003, p.303), the theoretical contradictions on the compact city’s virtues and the car’s value are mirrored by conflicting evidence concerning the desirability of dense neighbourhoods and disaffection with alternative travel modes. Furthermore, although density is operationalised in many different ways and the relationships between transport and social *exclusion* are now well understood, the mechanisms through which density functions to reduce car ownership remain opaque. The extent to which lower levels of urban car ownership might be a function of lower income levels in the city, inclusion on other dimensions which compensate for reduced car ownership or - to turn the automobility concept on its head - of people being coerced *out* of the car remains unclear. That the relationship between social *inclusion* and the car is underresearched means that the potential for community-level inclusionary benefits from low-level or non-car use is also untested.

Based on these theoretical and empirical tensions, more must be understood about social inclusion’s role in travel behaviour, and the nature of the relationship between urban form and car ownership/use, in order to fulfil the above research objectives.

Quantitative research questions designed in furtherance of the first objective are:

1. What are the relative impacts of social inclusion indicators, demographic risk factors and spatial factors in modelling car ownership?
2. How do spatial scale variables and demographic risk factors advance our understanding of relationships between household car ownership and social inclusion?

Specifically, the analysis will test the hypotheses that:

- a) All dimensions of social inclusion tested will be (positively) correlated with levels of household car ownership.
- b) All dimensions of social inclusion tested will act as (positive) predictors of car ownership.
- c) In multivariate analysis, larger urban settlements and greater urban density will have a (negative) statistically significant relationship on level of household car ownership whilst controlling for social inclusion indicators.

With respect to the quantitative analysis, there are two ways in which the research design has evolved in consideration of critiques of the inclusion/exclusion paradigm. In response to criticisms of the already abundant range of dimensions theorised, the analysis will employ established indicators rather than generating new ones.

Theoretical and policy literature also emphasises the idea of complex interactions between different dimensions of inclusion/exclusion. Some dimensions have specifically income-orientated components, albeit that

those components have ramifications beyond income level. The second currently relevant critique of the paradigm challenges it as simply a mask for what are fundamentally problems of poverty and suggests that increased financial resources could mitigate the impact of some other dimensions. Identifying other factors relevant to car ownership/use, then investigating the importance of income in car ownership/use, relative to those other factors, is therefore a key component of understanding how private transport access relates to social inclusion. Therefore, the dimensions tested must include an income variable in order to identify, respectively, the relationship between car ownership/use to other theorised dimensions of inclusion, and the strength of the relationship of income to car ownership/use.

Drawing from both theoretical and empirical literature, it can be hypothesised that spatial factors will moderate the income-ownership relationship. In order to clarify the mechanics by which density influences car ownership, designing variables at different spatial scales can be used to determine discrete effects, and so examine the possibility that there might be neighbourhoods where levels of car ownership and use are lower than might be accounted for using income as the sole predictive factor. Quantifying the relative importance of an income dimension and urban form to levels of car ownership/use will indicate the scope for decoupling increasing individual/ household wealth from increasing car use levels; multivariate analysis will also expose the extent to which other dimensions of inclusion predict car ownership levels when spatial scale is considered.

Analysing how car ownership status relates to other theorised dimensions of inclusion provides a means of assessing “*the urban renaissance without the car*” as a potentially sustainable option, identifying for whom and in what circumstances non- or low-frequency car use correlates with indicators of inclusion. It can also fulfil the research’s second objective by providing a robust foundation for a qualitative sampling frame by testing the relative

significance, direction and magnitude of different dimensions of inclusion and spatial variables on car ownership.

However, reverting to the problem that the range of definitions of inclusion is as wide as that of possible dimensions, the examination of the inclusion/exclusion paradigm in this chapter also serves to inform the qualitative approach. The established indicators tested quantitatively will not necessarily suffice to represent lived experiences of inclusion/exclusion relating to car ownership/use. In particular, both theoretical and empirical literature reviews indicate that affective factors are potential influences on travel behaviour. Taking this into consideration, the qualitative research questions designed to fulfil objectives two and three, although grounded in the statistical analysis, invite an inductive approach: firstly, to determine the ways in which the dimensions tested may or may not be considered important; and secondly, commonalities of attitude and experience may suggest other dimensions which the interviewees prioritise. The qualitative approach is further developed in Chapter 6, but pending the quantitative analysis, the second phase of the research will seek lessons for regeneration by further examining the sustainability of the urban renaissance without the car through an investigation of the ways in which the urban experience is perceived as inclusive or exclusive. This will be achieved by exploring:

1. How do car ownership and use relate to wider issues of social inclusion as evidenced in the statistical analysis?
2. Why might density, as evidenced in the statistical analysis, influence car ownership, use and alternative travel choices?

The next chapter details the data, methods and findings from the quantitative component of the research. Thereafter, the development of the research design and methods applied in the qualitative component of the thesis will be described in Chapter 4.

4 Understanding Social Inclusion and Car Ownership: The Data

4.1 Introduction

The opening section of the chapter develops the research questions presented at the end of Chapter 3 in further detail, drawing out the connections between the literature review and the analysis presented in this chapter in relation to the contribution of quantitative methods. Thereafter follows an introduction to the BHPS, the main source of data employed in the analysis, giving details of the general characteristics of the sample. Finally, the process of generating demographic, spatial and inclusion indicators is described and descriptive statistics for the relevant variables are presented¹⁶.

4.2 Quantitative Research Questions

From academic and policy perspectives, geography - in particular, *urban* geography - constitutes a crucial aspect of social inclusion and exclusion. Urban theory has envisioned the city as the archetypal site of alienation as well as of interaction. In contemporary terms, these city-visions have been realised in area-based initiatives and the theorising of neighbourhood disadvantage, in parallel with a new acceptance of the city as the driver of the regional economy and the ideal of the urban renaissance. Drawing on the positive aspects of these urban visions, physical space and mobility are core determinants of whether or not it is possible to be 'included'. Although the advent of the digital age has provided another means of

¹⁶ This research was based on the British Household Panel Survey, wave m, 2003, UKDA study number 6233. Principal Investigator: University of Essex, Institute for Social and Economic Research. Data Collectors: GfK NOP, Office for National Statistics: Northern Ireland Statistics and Research Agency. Sponsor: Economic and Social Research Council. Distributed by the UK Data Archive, University of Essex, Colchester. Copyright: Institute for Social and Economic Research.

overcoming space, physical accessibility remains an important part of social, economic and civic engagement where, outside of the virtual world, the car is the mode of mobility *par excellence*.

The multiple dimensions of the social inclusion paradigm open a conceptual space, whereby it is potentially possible to have ‘included’¹⁷ status on a range of other dimensions, whilst being ‘excluded’ on the income dimension. However, although the correlation between income and car ownership is well established and there is a body of work that specifically addresses the ramifications of transport disadvantage, little is understood about how car ownership relates to the wider concept of social inclusion, involving participation across other social and economic dimensions. However, whilst it is reasonable to hypothesise correlations between various dimensions of inclusion/ exclusion and car ownership, the situation as regards causation is far less clear. Indeed, there is a very limited extent to which an attributed status of ‘included’ or ‘excluded’ to a person, household or even neighbourhood on any one dimension can be seen as a cause of car ownership or otherwise. Nonetheless, given the debate about the role of income poverty within the broader concept of social exclusion (Levitas, 2000; Silver, 1994), the relative importance of different dimensions of social participation is very much of interest. Access to a private car can be understood as instrumentally inclusive, facilitating participation across a number of dimensions by increasing personal and family mobility - to the extent that it can be considered highly desirable or even necessary, for full social participation. It is therefore possible to contribute to the understanding of the relationship between social inclusion and car ownership by quantifying the relative statistical significance, direction and magnitude of the relationships between levels of car ownership and those dimensions of inclusion where a car might support social inclusion.

¹⁷ For the purpose of clarity, where the words ‘included’ and ‘excluded’ refer to social inclusion/ exclusion status, they will appear in inverted commas. Similarly, any reference to variable or dataset names will be italicised (e.g. *no car*).

The question of how effectively the social inclusion paradigm might provide a means of understanding the variance in levels of car ownership is raised by the wealth of qualitative research dealing with transport disadvantage/exclusion. Since the distribution of car ownership, along with that of income, is patterned by different demographic groups, although there is research substantiating the relative disadvantage of particular social groups, such as elderly women, the extent to which demographic factors such as age and gender have a bearing on car ownership *once income has been controlled for* is unclear. As household access to private transport is correlated with both the frequency and distance of travel undertaken by *all* household members, without understanding the differential impact of demographic factors when controlling for income, it is difficult to predict how changes in household income are likely to impact on one hand upon levels of car ownership and on the other, what bearing this might have on levels of participation across other dimensions of social inclusion.

Returning to the theme of physical space, existing quantitative evidence demonstrates a negative correlation between degree of urbanisation and levels of car ownership. Nevertheless, despite a general acceptance that more concentrated amenities mean less need to travel, knowledge about the relationship between urbanisation and levels of car ownership tends to come at aggregate levels, in relatively broad strokes. The most thorough expositions of the relationships between income, spatial scale and car ownership in the UK comes from Dargay (2002, 2005). However, as discussed in Chapter 3, this analysis employs relatively large geographic units for the higher tier analysis and population density figures for the lower tier. Both variables involve considerable ‘smoothing out’ of what on the ground are highly varied patterns of urban settlement, which give no indication of the impact of the built environment on levels of car ownership at neighbourhood level. This deficiency negates the possibility of differentiating between the income effects and any effects the physical environment might have on variance in car ownership levels.

Quantitative methods provide an ideal tool for analysing car ownership in relation to social inclusion in that they can isolate the effects of income, which is well established as having a strong correlation with levels of car ownership, and quantify the influence of other factors whilst holding income stable. Additional to investigating interactions between social inclusion and car ownership over time, the data can also be used to estimate the individual effects of multiple socio-economic and spatial determinants on car ownership and predict the proportion of the variance in the dependent variable. Although necessarily a simplified representation of real-world processes, this econometric modelling provides a means of formulating hypotheses that are mostly qualitative in nature in a measurable and empirically verifiable form (Maddala, 2001; Gujarati, 2003). Secondly, hypothesis testing in the modelling process means that inferences can be based on a defined level of confidence, giving a robust foundation to the underlying proposition that factors other than income can act as determinants of car ownership (Dougherty, 2002). Furthermore, the predictive element of modelling can allow inferences to be drawn as to how a range of societal, affective and economic processes will operate under certain conditions. This information will provide an empirical basis for selecting populations from which interview samples for qualitative research can be drawn and provide that work with a broader context (Field, 2000). Finally, the quantitative phase of the research will develop existing empirical work, synthesising knowledge about the determinants of car ownership and the dynamics of social inclusion.

Given the focus of this research upon car ownership and the links between social inclusion and accessibility, the quantitative aspect of the research employs a framework developed by Burchardt, LeGrand and Piachaud (2002); as detailed in Chapter 3, their work provides an understanding of social inclusion in terms of participation along four dimensions, defined as economic consumption, economic production, political engagement and social interaction. Mobility is implicated in all of these dimensions;

therefore, the initial model will employ a descriptive analysis of the relationship between these ‘outcome’ indicators of social inclusion and the dependent variable of household car ownership. Thereafter, regression analysis provides an appropriate means of disentangling the competing impacts of social inclusion/exclusion, demographic risk factors and spatial variables on car ownership by estimating the relative direction, magnitude and statistical significance of each independent variable, whilst controlling for the effects of the other variables in the analysis.

To achieve this end, a dataset was constructed including social inclusion indicators, other demographic data relevant to car ownership and social inclusion, and spatial data at three different scales from settlement size and neighbourhood type through to household accommodation. Thereafter, a series of statistical models of car ownership in Great Britain was developed in order to address the quantitative research questions:

1. What are the relative impacts of the social inclusion indicators in modelling car ownership?
2. How do spatial scale variables and exclusion risk factors advance our understanding of the relationships between social inclusion and household car ownership?

Specifically testing the hypotheses that:

- a) All dimensions of social inclusion tested will be (positively) correlated with level of household car ownership
- b) All dimensions of social inclusion tested will act as (positive) predictors of car ownership

- c) In multivariate¹⁸ analysis, larger urban settlements and greater urban density will have a (negative) statistically significant relationship on level of household car ownership whilst controlling for social inclusion indicators

The following section provides further details on the construction of the dataset used in this research prior to describing the general characteristics of the sample and introducing the variables used in the analyses.

4.3 The Data

Due to the policy-relevance of the topic, the decision was taken to employ secondary data for the quantitative analysis. Large, complex datasets, such as the General Household Survey, the British Social Attitudes Survey and the BHPS have the advantage of being gathered by social research organisations with substantial resources and provide a sample size and geographic spread that could not be achieved by an individual researcher (Bryman, 2004). Nevertheless, additional to these and other advantages of using secondary data (see Table 4.1), there are also drawbacks.

¹⁸ In econometric literature, the term “multivariate analysis” can be understood as referencing multiple dependent variables; within this thesis it is employed in the social scientific sense, referring to multiple regressions.

Table 4.1 Advantages and Disadvantages of Secondary Analysis

Advantages	Disadvantages
Cost and time High quality data Opportunity for longitudinal analysis Subgroup analysis Opportunities for cross-cultural analysis More time for data analysis Re-analysis may offer new interpretations Meeting the wider obligations of the social researcher by making full use of already available data	Lack of familiarity with the data Complexity of the data No control over data quality Absence of key variables

Source: Bryman, 2004, pp.202-206 (adapted from Dale, *et al.*, 1988).

The impact of the disadvantages above is discussed in the following section, which introduces the main dataset, and in a section in Chapter 5, on the limitations of the quantitative research.

4.3.1 The British Household Panel Survey

The main data source used in the construction of the dataset is the BHPS. The BHPS, which is administered by the Institute for Social and Economic Research at the University of Essex, is a representative survey of 5,500 households and around 10,300 individuals across 250 areas of the UK. One “wave” of the survey has been taken each year since 1991, with researchers returning to collect data from every adult member of the participating households.

The BHPS was selected as it provides high-quality data covering an array of income information, household characteristics, vehicle ownership (as a count, capped at 3+) and other information about individual interviewees including political and social attitudes. Although it is not a transport

dataset, a range of features makes the BHPS an attractive dataset for this research. Firstly, considering the well-established correlation between income and car ownership and the importance of income within debates about the role of social inclusion within the history of understanding disadvantage, the credibility of the income indicators in the BHPS provides strong motivation for working with this dataset. The level of detail which the survey demands from respondents - including income by source and other indicators of wealth such as savings, income from investments and property values - encourages thought and accuracy.

This point is reinforced by the nature of the survey, where returning to the same families year after year mitigates some of the more obvious problems of collecting income data, such as reluctance to reveal income or refusal to take part in the survey reducing with familiarity (Thomas, 1999).

The separate datasets for individual and household data also permit the incorporation of individual data into a household-based analysis. Preliminary modelling work included information on voting, membership of environmental organisations, assessment of local services including public transport, mode of travel to work and attitudes towards neighbourhood were available additional to more standard information on gender, ethnicity, level of education and social grouping classifications, although not all of these were used in the final analysis¹⁹

Finally, one of the earliest and best-known operationalisations of the social inclusion paradigm into quantitative indicators was conducted using the BHPS. Rather than crowd an already complex array of dimensions with new measures (section 3.2.2), this permitted an investigation of the relationship between car ownership using already-established measures. Every effort

¹⁹ Variables were excluded on the basis of analysing bivariate correlations and t-values and significance in multiple regression modelling.

was made to minimise changes to the original Burchardt *et al.* (2002) indicator design.

A further attractive feature of the BHPS, which was not exploited in this instance, is its status as panel data. Although working with a panel offers the scope to track changes in the *car ownership/social inclusion* relationships over time and produce predictions of how future dynamics might operate in light of changes in population, policy or economic conditions, it also limits the ability of logistic regression to predict the dependent variable to binary level, modelling only whether or not a household might have access to a car. Cross-sectional analysis was employed here in preference to differentiate thresholds of probability between 0, 1, 2 and 3+ cars, so furthering knowledge of the relationship of not only carlessness but *level* of car ownership to other factors.

In summary, the BHPS datasets accessible through the data archive could provide household-level data, individual data from the Household Representative Person which could then be merged with household information, and a separate dataset including a measure of net annual household income, equivalised to take account of household size and composition using the McClements scale.

4.3.2 Additional Data

Despite the numerous advantages of using the BHPS, as is common with large secondary datasets, the anonymity of respondents requires a trade-off between income and geographic data. Although the data available through the data archive can be disaggregated geographically to regional level, given the diverse settlement distributions, which can occur even *within* regions, the absence of any measures of urbanisation is a limitation. The possibility of creating a *population density by region* variable was rejected, due to the misleading results that this could generate (e.g.

Scotland - which is classified as one region - has a very concentrated population in some areas of the Central Belt and a highly dispersed population in rural areas, particularly across the Highlands).

However, for the purpose of this analysis it has been also possible to attach additional spatial variables. This additional spatial data was provided by Professor Gwilym Pryce, with the generous help and permission of Prof Buck of the Institute for Social and Economic Research (ISER). These variables were originally supplied to Professor Pryce by Experian and Hometrack and include neighbourhood variables such as typical house type and distance between dwellings at postcode unit level. In addition to the spatial data attached by the BHPS, Experian also kindly provided details of the urbanisation index used in the construction of the Mosaic indicators employed in the additional data. This data has been used in the thesis to provide a greater understanding of how spatial factors that mediate the relationships between car ownership and social inclusion can be attained without compromising the confidentiality of the BHPS respondents. Summary details on the construction of each variable and the original dataset from which it was derived from can be found in Tables 4.2, 4.3 and 4.4. The analysis was cross-sectional to allow maximum flexibility of output regarding the dependent variable and centre on wave thirteen (the 2003 dataset, prefixed *m*-), as the most recent wave for which the extra spatial variables were available.

Table 4.2 Derivation of Dependent Variable and Social Inclusion Indicators Used in the Analysis

Grouping	Variable Name	Variable Label (RC = reference case)	Source Variable(s) [Source Dataset]
Dependent Variable	mcarhh	Car or van for private use (continuous)	mncars [mhhresp.sav]
Consumption Inclusion	minca11	RC: net equivalised annual income 11,000 or less	mhhyneti [m_neta.sav] mfieqfcb [m_neta.sav]
	minca22	net equivalised annual income 11,001-22,000	
	minca33	net equivalised annual income 22,001-33,000	
	minca44	net equivalised annual income 33,001-44,000	
	minca55	net equivalised annual income 44,001-55,000	
	minca66	net equivalised annual income 55,001-66,000	
	minca77	net equivalised annual income 66,001-77,000	
	minca88	net equivalised annual income 77,001-88,000	
	minca99	net equivalised annual income 88,001-99,000	
	minca99p	net equivalised annual income 11,001-22,000	
Production Inclusion	munemp	Unemployed HoH (Head of Household)	mjbstat
	mearret	HoH Retired before state pension age	mjbstat [mindresp.sav] mage [mindresp.sav] msex [mindresp.sav]
	msdis	Long term sick or disabled HoH	mjbstat [mindresp.sav]
	mothemp	Other employment status	
	memp	RC: Employed HoH (including on maternity leave)	
	msemp	Self employed HoH	
	mfam	Family care HoH	
	mstud	Full time student/ on government training scheme HoH	
	nearet	HoH Retired before state pension age	
	mretstat	HoH Retired at state pension age or over	mjbstat mage msex
Civic Inclusion	mcivinc	Civic inclusion	mvote7 morgma morgaa morgmb morgab morgmd morgad morgme morgae [mindresp.sav]
Social Interaction Inclusion	msintinc	Social interaction inclusion	mssupa mssupb mssupc mssupd mssupe [mindresp.sav]

Table 4.3 Derivation of Social Exclusion Risk Variables Used in the Analysis

Grouping	Variable Name	Variable Label	Source Variable(s) [Source Dataset]
Demographic Risk Factors	msvtn	HoH age 17 to 24	mage12 [mindresp.sav]
	mtwfv	HoH age 25 to 34	
	mthfv	HoH age 35 to 54	
	mfiffv	HoH age 55 to 64	
	msxtfv	HoH age 65 to 74	
	mosvtfv	HoH age 75 and over	
	mmale	HoH male	msex [mindresp.sav]
	mfemale	HoH female	[mindresp.sav]
	mkids	Number of children in household	mnkids [mhhresp.sav]
	msize/ mnemp	Number of people (employed) in households	mnsizemp [mhhresp.sav]

Table 4.4 Derivation of Spatial Variables Used in the Analysis

Grouping	Variable Name	Variable Label	Source Variable(s)
Spatial Variables	mdetach	Detached property	mhstype [mhhresp.sav]
	msemi	RC: semi-detached property	
	mterr	Terraced property	
	mflats	Flats	
	minstbus	Institutional or business premises	
	mdomd	Predominantly detached neighbourhood	mppd_do1 [w13gpr.sav]
	mdoms	RC: predominantly semi-detached neighbourhood	
	mdomt	Predominantly terraced neighbourhood	
	mdomf	Predominantly flats neighbourhood	
	murb1	RC: least urbanised quintile	mosaicu1 [w13gpr.sav] and Experian
	murb2	Second least urbanised quintile	
	murb3	Middle quintile of urbanisation	
	murb4	Second most urbanised quintile	
	murb5	Most urbanised quintile	

4.4 Characteristics of the Sample

This section begins by providing context on the scope for generalising from the sample used in the analysis before going on to provide an overview of the general characteristics of the sample, including descriptive statistics.

4.4.1 Generalising from the Sample

Before presenting the main characteristics of the sample, some caveats concerning survey data in general, the BHPS in particular and the creation of the dataset under analysis here specifically should be noted.

The Representativeness of the Sample

Any survey which aims to be representative of the wider population will face challenges with regard to non-response bias. That is, non-response is patterned rather than random as groups such as the elderly, who are more likely to spend time at home, are easier to contact. However, in the case of the BHPS, as a household survey, data is collected about both household and individual characteristics, so that any member of the household can provide useful information about the household as a whole. The household representative person (the conventional *head of household*, HoH) is designated as the principal owner or renter of the property; where there is more than one potential candidate for the position, the eldest person is designated as the HoH so that in cases where individual data is missing, information about the HoH can be imputed to the rest of the household. Taking into consideration the role of car ownership as a benefit to the household as well as to the individual owner (Section 1.2.1), the household provides a particularly appropriate unit of analysis for this study. Since having access to a car influences travel behaviour across the household, this analysis is conducted at that level, combining the socio-demographic

from the household as a whole with individual characteristics drawn from the HoH.

For the purposes of this research, in order to compare household to household, where it is useful to include individual-level data, e.g. characteristics such as age or voting activity, the HoH data has been merged with the household file for each case - therefore any individual data discussed refers to the head of the household. Consequently, the distributions of age, gender and income presented in the next section are the individual characteristics of *primary householders* rather than individuals. A further corollary of the BHPS being a *household* panel survey is that it excludes the homeless and those resident in institutions of any kind, therefore experiences of these relatively vulnerable populations are excluded from the data. Comparison with census data also showed that the BHPS under-represented households in rented tenure, those with six-plus individuals and those that did not have any access to cars or vans (Taylor, cited in Barnes, 2005).

BHPS Sampling Strategy

The BHPS pursues a stratified sampling strategy. To use resources efficiently, although the end result aims to be representative of the population as a whole, selected households are targeted in geographic clusters rather than dispersed evenly across the country. Initially the sampling strategy was such that the dataset was representative only of Great Britain as a whole. Following the addition of extension samples, from wave 9 onwards, data can also be analysed at the level of the component countries. However, the additional spatial data is only available for Scotland, England and Wales. Analysis is therefore restricted to Great Britain.

Weighting and Sample Size

A further concern with representativeness in a longitudinal study is attrition. From year to year, there will be participants who cannot be contacted or drop out of the study. The BHPS protocols include thorough panel maintenance procedures and a refusal conversion process, to minimise the problems of loss of contact and non-response.²⁰ It is also replenished by incorporating babies born to original sample members, when original sample members move to new households and when one or more new people move in with an original sample member.

To compensate for attrition and non-response the BHPS provides a selection of longitudinal and cross-sectional weights. Selection of the appropriate weight is also determined by whether the sample under study is specifically focused on one of the extension samples (Scotland or Wales) or on the United Kingdom or Great Britain. This research applies the cross-sectional weight for data representative of Great Britain throughout (*mxewtuk1*).

As discussed, the core of the sample is drawn from the household dataset of wave *m*. The original BHPS source (*mhhresp*) contains 9045 cases from across the UK. Removing data from Northern Ireland leaves 7446 cases from the original dataset. Taking account of missing values within the dependent variable, car ownership and the primary independent variable, income, this further reduces the sample size to 5927 cases. For the purposes of this analysis, the weighted sample is used, applying *mxewtuk1*. The procedure of applying weights gives a baseline sample size of 7734 cases used in the majority of statistical analyses.

Within this context, the general characteristics of the sample in terms of gender, income, age and car ownership are outlined in the following

²⁰ BHPS User Manual Volume A (A4 9-13).

subsections, whilst more detailed descriptive statistics of variables used in the analysis are presented in Section 4.5.

4.4.2 Gender

As stated above, due to the influence of car ownership on *household* travel behaviour, the analysis was conducted at household level, therefore all individual characteristics described are those of the HoH. Table 4.5 below shows that 66.4% of the heads of household in the sample were male and 33.6% female once the appropriate cross-sectional weight was applied.

Table 4.5 Gender (Head of Household)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	5137	66.4	66.4	66.4
	Female	2598	33.6	33.6	100.0
	Total	7734	100.0	100.0	

Cross-sectional adult enumerated weight n = 7734

4.4.3 Age

Descriptive statistics for the distribution of HoH age in the sample are presented for both the continuous variable and the categorical variables used in the analysis. The banded categorical variable permits the analysis of the age-effects on levels of car ownership.

Table 4.6 Age (Head of Household) – continuous variable

N	Valid	7734
	Missing	0
Mean		53.4026
Median		52.0000
Std. Deviation		18.41411
Variance		339.079
Skewness		.178
Std. Error of Skewness		.028
Kurtosis		-.998
Std. Error of Kurtosis		.056
Range		81.00
Minimum		16.00
Maximum		97.00

Table 4.6 above shows a mean head of household age of 53 years, and an age range of 16 to 97 years. The kurtosis figure indicates whether a distribution is peaked (a positive kurtosis figure) or, in the case of a negative figure, flat. In SPSS a kurtosis of zero indicates a normal distribution. The skewness figure indicates the extent to which a distribution is asymmetrical (again, a normal distribution has a value of zero). Positive skewness indicates a long right tail, whilst negative skewness means a long left hand tail. Where the standard error of the skewness is more than double that of the skewness figure itself, there is significant non-normality. In this case, the variable follows a broadly normal distribution, indicated by kurtosis and skewness figures approaching zero. However, as might be expected in a household survey, there are higher frequencies towards the upper end of the distribution than in the lower age ranges.

For the purposes of analysis, this variable was disaggregated into separate dummy variables. Descriptive statistics for the age variables in categorical form are shown in Table 4.7.

Table 4.7 Age (Head of Household) – categorical

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HoH under 17 years	1	.0	.0	.0
	age 17 - 24	285	3.7	3.7	3.7
	age 25 - 34	1059	13.7	13.7	17.4
	age 35 - 44	1550	20.0	20.0	37.4
	age 45 - 54	1273	16.5	16.5	53.9
	age 55 - 64	1204	15.6	15.6	69.4
	age 65 - 74	1057	13.7	13.7	83.1
	age over 75	1307	16.9	16.9	100.0
	Total	7734	100.0	100.0	

Cross-sectional adult enumerated weight n = 7734

Table 4.7 indicates that the largest category of age group was the age 35-44 band, representing 20% of the sample. Despite the generally normal distribution of age in the sample, there is a slight increase in frequencies at the very upper age band, with those *aged 75-plus* forming the second-largest category. It can also be seen that although the sample includes householders below the age of 17, the point at which they can hold a driving licence, these form a very small proportion of total households (less than 0.1% of the weighted sample). The two youngest age categories formed the smallest groups. The weighted sample incorporates 1 case where the head of household is under 17 years old and 285 cases from the age 17 - 25 category. The research is undertaken using the household as the unit of analysis, therefore all householders, including those below 17 years of age (who although not drivers themselves, might benefit from access to a car owned by another household member). Nonetheless, it seems likely that, even with the application of weights to compensate for non-response bias, younger households remain slightly under-represented with elderly households over-represented in the sample.

4.4.4 Income

The BHPS contains a range of options for understanding income. In this instance, as the analysis was cross-sectional, the variable employed was an equivalised version of the net annual household income variable *mhhanet*, which was merged into this sample from the *mnet* dataset. This Figure was then equivalised using the McClements scale in order to take account of the size and composition of the household, allowing comparability between the incomes of differently structured households²¹.

Table 4.8 Equivalised Net Annual Household Income (GBP)

N	Valid	7734
	Missing	0
Mean		24714.43
Median		17863.44
Std. Deviation		23045.07
Variance		531075373.67
Skewness		2.134
Std. Error of Skewness		.028
Kurtosis		8.323
Std. Error of Kurtosis		.056
Range		372850.72
Minimum		.00
Maximum		372850.72

Table 4.8 shows the mean of the equivalised net household income figures in the sample for wave *m* to be £24,714. The lower median of £17,863 indicates a positive skew to the distribution, showing that, as might be expected, the majority of observations are towards the lower end of the income scale. Skewness and kurtosis Figures, at 2.134 and 8.323 respectively, confirm that equivalised net household income is a non-normally distributed variable. A number of these cases²² include extremely low-income figures ranging from zero to less than £1,000 annually. Given

²¹ "Income" throughout the quantitative analysis refers to equivalised net annual household income.

²² 75 cases

the complexities of reporting net income, particularly where state benefits are concerned, and the added process of equivalisation, where an income variable is reported rather than logged missing, it has, however low, been included in the analysis.

4.4.5 Household Car Ownership

The BHPS defines car ownership broadly, as having (not necessarily *owning*) a car or van available for private use. The issue of ownership therefore includes company cars or vans that are also available for private use. Correspondingly, the term “car ownership” is also be used in this sense throughout the quantitative commentary and analysis. As noted earlier, for any given household, the HoH might not themselves be the driver or car owner but access to a car is assessed as a household benefit. The cross-sectional analysis gives scope for analysing car ownership beyond the binary level. However, it should be noted that the variable is capped at “3 *plus*” cars. The census collects data on car ownership to higher levels but, as can be seen from Table 4.9 below, a relatively small percentage of households have more than three cars.

Table 4.9 UK Levels of Household Car Ownership (% of total)

Number of Cars in Household/ Geography	0	1	2	3	4+
England	26.8%	43.7	23.6	4.5	1.4
Scotland	34.23	43.35	18.62	2.98	.08
Wales	26.0	45.5	22.9	4.3	1.2
Northern Ireland	26.3	44.5	23.6	5.6	NA

Source: ONS, 2001 census

The sample used for this research (Table 4.10) shows 74% of households have access to a car or van for private use. The largest category of ownership is households with *1 car*, forming 42.5% of the sample. Table 4.10 also shows that households with *2 cars* comprise 26% of the sample - evenly balancing those without private car access - whilst households with *3+ cars* constitute only 5.3% of the sample.

Table 4.10 Number of Cars or Vans in Household for Private Use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 cars	2009	26.0	26.0	26.0
	1 car	3311	42.8	42.8	68.8
	2 cars	2009	26.0	26.0	94.7
	3+ cars	406	5.3	5.3	100.0
	Total	7734	100.0	100.0	

Cross-sectional adult enumerated weight n = 7734

4.4.6 Summary

This section has outlined some of the challenges in achieving statistically generalisable data, firstly, in large-scale surveys and, secondly, in the process of creating a sample drawing from secondary data. An outline of the general characteristics of the sample under study has been presented. Information on the construction of variables used in the analysis will now be given, alongside appropriate descriptive statistics.

4.5 Variables Used in the Analysis: Descriptive Statistics

In this section, the variables used in the analysis are categorised within three subsections - inclusion indicators, demographic data and spatial variables - reflecting the field of research to which the individual variable is relevant.

4.5.1 The Social Inclusion Indicators

Chapter 3 (Section 3.2) described various quantitative operationalisations of the social inclusion/ exclusion paradigm in some detail. The Burchardt *et al.* (2002) approach involved creating ‘outcome’ indicators, which are designated as demonstrating inclusion/ exclusion across four different dimensions of social participation:

- Economic Consumption

- Economic Production
- Political Engagement
- Social Interaction

This operationalisation is of particular interest within the context of the overarching research question in that it centres on the concept of participation and, consequently, on the role of mobility and accessibility in social inclusion - in effect, on the balance between car ownership and urbanisation. The Burchardt *et al.* (*ibid.*) original constructions have been followed as closely as possible, although some necessary adaptations have been made. These are detailed in the subsections below, along with descriptive statistics and information on bivariate correlations between each inclusion indicator and the dependent variable.

Consumption Inclusion (*Economic Consumption*)

Income has formed a focal point of interest in understanding both levels of car ownership and the nature of disadvantage more generally. The Burchardt *et al.* (2002) conception of *economic consumption*, based on real equivalised net household income before housing costs, was designed to capture the capacity to purchase goods and services. The inclusion/exclusion cut-point is taken at 50% of the mean. Of the four dimensions explored here, this is the only one where a truly determinant rather than descriptive relationship can be investigated, in that owning or running a car incurs financial costs.

For the purposes of this analysis, two modifications were made to the original Burchardt *et al.* variable design. Firstly, given that this is a cross-sectional analysis, the actual rather than the deflated income figures were employed; the annual net household income figure from the dataset was adopted and equivalised using the McClements scale. In recognition of the

importance of income as a factor in car ownership and the geographic variability of housing costs across Great Britain, a further income variable was created showing equivalised net income *after* housing costs. However, substituting this variable had little impact in preliminary statistical analyses and, because of missing values, involved considerable loss of data. The *equivalised net annual household income before housing costs* variable was therefore retained as the preferred inclusion indicator to proxy for economic consumption.

A second change to the Burchardt *et al.* indicator design was employing the more widely accepted ‘poverty line’ measure of 60% of median income (Levitas *et al.*, 2007). As shown in section 4.4.4, the median equivalised net annual income Figure for the sample was £17,863, giving an inclusion/exclusion cut point at £10,718. For ease of management, for the purposes of this research the inclusion threshold was taken as £11,000, capturing all cases with excluded status on the income dimension.

The third modification to the original concept takes account of the non-linear relationship between income and car ownership. The consumption inclusion indicator was re-designed categorically, with each category representing an equal financial increment. The final inclusion indicator, seen in Figure 4.1 below, categorises all cases with an equivalised net annual income of below £11,000 as excluded and bands further income categories in increments of £11,000 at a time to reflect the changing relationship with car ownership as household income increases.

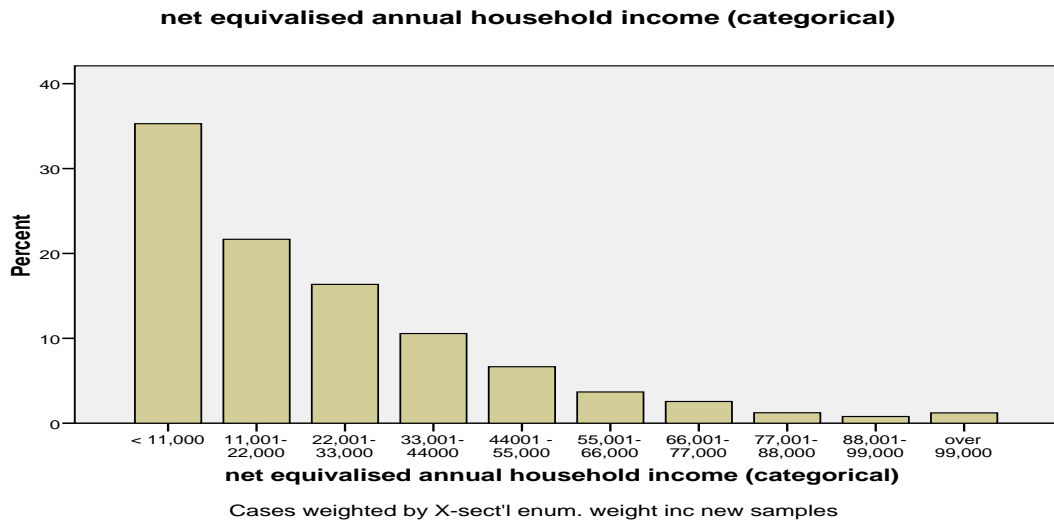


Figure 4.1: Net Equivalised Annual Household Income

As would be anticipated with a figure of income distribution, the consumption inclusion indicator is strongly non-normal, exhibiting a positive skew as frequencies tail away on the higher income levels (there is however a slight ‘bump’ in the final *over £99,000* category). The ‘excluded status’ cases, with a *equivalised net annual household income of less than £11,000*, form the largest category, comprising just over 35% of the total weighted sample.

Production Inclusion (*Economic Production*)

Whilst the *consumption inclusion* indicator can be considered as capturing both the relationships between income and car ownership, as a form of transport inclusion, and income as a determinant of car ownership, the concept of *production inclusion* recognizes that the mobility afforded by private car transport can also influence the potential to participate in society by contributing economically. The source indicator, *economic production*, used by Burchardt *et al.*, acknowledges economic participation

in its widest sense: the indicator is defined as “participation in economically or socially valuable activities” (*ibid.*, p.31), including the categories of “family care” and “student”, which can be considered as indirectly economically productive (for example, in terms of the potential workforce, studying can be a capacity-building activity whilst family care can support both the current and develop the future labour pool) but often do not attract a direct financial reward. Notably, the category of “early retired” is designated as excluded in the original construction of the variable, whilst those retired over state pension age are assumed to be socially included. Although the rationale behind this decision is not made explicit for the original variable, when hypothesising the potential relationship between car ownership and some form of production inclusion, the mobility afforded by private transport is likely to increase scope for participation in activities which are productive as both paid and unpaid work. The subcomponents of the original *economic production* dimension designated ‘included’ and ‘excluded’ by Burchardt *et al.* (*ibid.*) are summarized in Table 4.11.

Table 4.11 The Burchardt *et al.* (2002) Economic Production Dimension

Dimension Category	Included	Excluded
Employment Status	Employed Self-employed Maternity leave Family care Full time student/ on government training scheme Retired on or after state pension age	Retired before state pension age Long term sick or disabled Unemployed Other employment status

Women (who form the majority gender of those engaged in family care - 33.6% of this sample), the elderly and young people are less likely to have access to a household vehicle (see Section 3.3.1). In order to quantify how *production inclusion* correlates with car ownership, Burchardt *et al.*’s

source variable was disaggregated into its constituent parts for the purposes of this analysis.

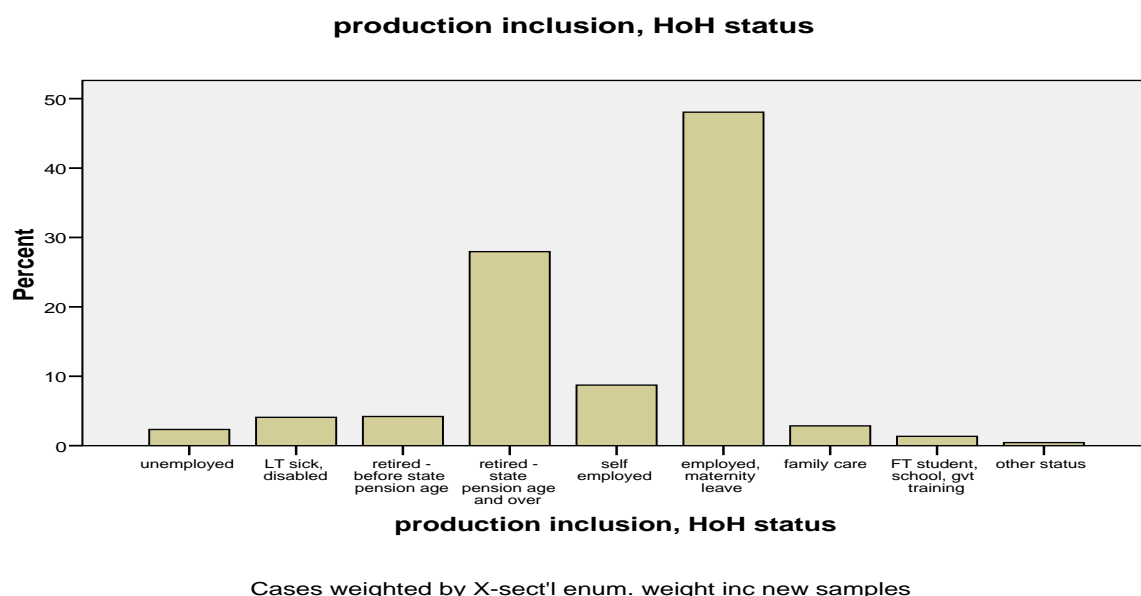


Figure 4.2: Production inclusion, HoH status.

Following Burchardt *et al.*, the original retired category from the *mjbstat* variable has been divided into those retired below state pension age and those retired at state pension age and over - respectively 4.2 % and 28.0% of the sample. The latter grouping, designated ‘included’ in terms of *production inclusion*, forms the second-largest category of cases in the sample. The largest category here, comprising 48.1% of the sample, is formed by cases where the head of household is employed (this category includes those who are currently on maternity leave). The other ‘excluded’ categories on the *production inclusion* dimension, along with *retired before/after state pension age* make up a relatively small proportion of the total cases: unemployed (2.3%); long term sick and disabled (4.1%); and other (0.4%).

Civic Inclusion (*Political Engagement*)

The source variable (*political engagement*: Burchardt *et al.*, *ibid.*) for the civic inclusion indicator has been duplicated identically; the name-change to *civic inclusion* is intended only to represent the components of the indicator more faithfully. This indicator combines contributions to political and civic decision-making activity by designating those who are a member of or active in a political party, trade union, parents' association or residents' association or voted in the last election as civically included.

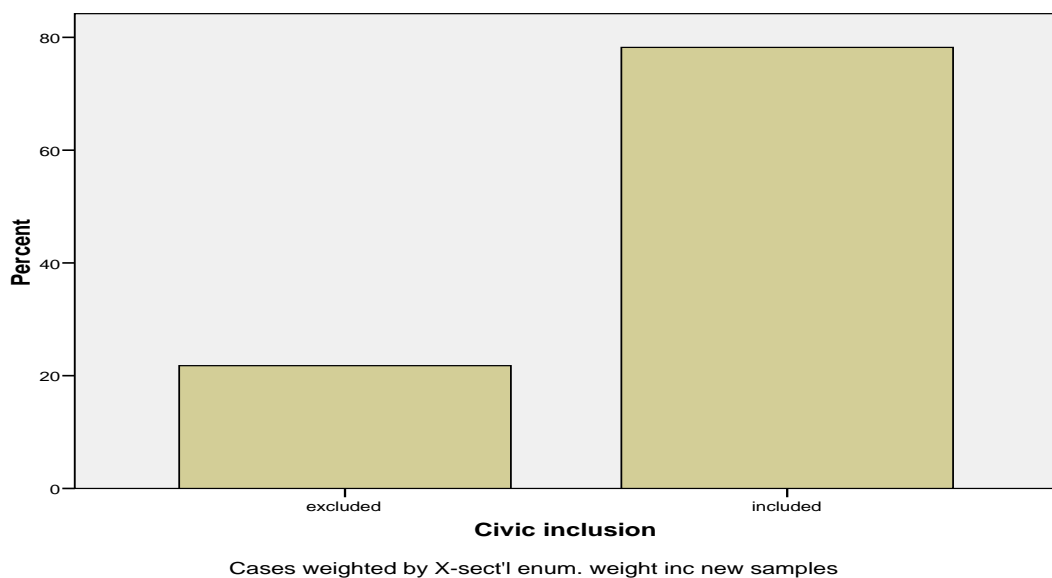


Figure 4.3: Civic Inclusion (Categorical)
Cross-sectional adult enumerated weight n = 7167

As illustrated in Figure 4.3, assessing the relationship between civic inclusion and car ownership is complicated by 114 missing values associated with the civic inclusion variable, reducing the n Figure to 7167. Of this valid percentage of cases, 21.8% of the weighted sample is civically excluded and 78.2% included.

Social Interaction Inclusion

Wave *m* of the BHPS, on which this analysis is based, contains all of the variables used to build the Burchardt *et al.* (*ibid.*) social interaction indicator, so their process has been replicated to create the *social interaction* inclusion indicator used here. As with the source variable, cases are designated ‘included’ where the head of household responds positively to *all* the questions in Box 4.1

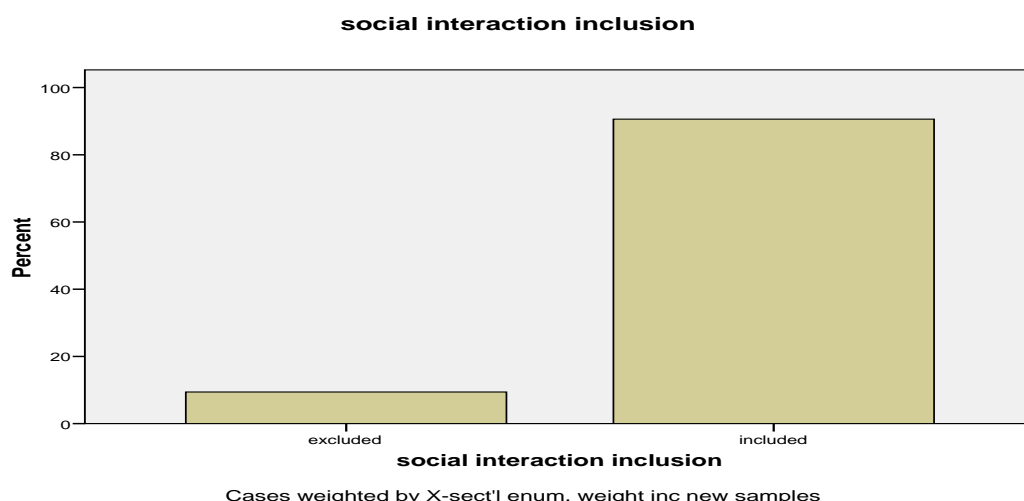
Box 4.1 Burchardt *et al.* (2002) Social Interaction Dimension

Is there anyone who:

- You can really count on to listen to you when you need to talk?
- You can really count on to help you out in a crisis?
- You can totally be yourself with?
- You feel really appreciated as a person?
- You can really count on to comfort you when you are very upset?

In contrast to the civic inclusion indicator, rather than envisioning social inclusion as participating in formally established social networks, this indicator takes a more personal mental health/ wellbeing perspective to look at participation in informal networks for the purpose of mutual emotional support.

Within this sample, the great majority of cases were designated as included on the social interaction criteria (see Figure 4.4), with only 9.4% of the valid sample falling into the excluded category (with 281 missing values on the indicator, the Figure available for statistical analysis is $n = 7453$).



Cases weighted by X-sect'l enum. weight inc new samples

Figure 4.4: Social Interaction Indicator – Descriptive Statistics.

4.5.2 The Demographic Risk Factor Variables

This section presents the demographic determinants of social inclusion/exclusion that were used in the analysis. These are characteristics that have been persistently associated with disadvantage and, as such, are referred to as ‘risk factors’ by Burchardt *et al. (ibid)*: gender; age; the number of people in employment in the household; and the number of children in the household. It should be noted that the *gender* and *age of head of household* variables, in particular, carry implications for household structure. Within contemporary British culture, women in heterosexual partnerships tend to be younger than their male partners and be lower income earners, making them less likely to be designated as the head of household under the BHPS criteria (see Section 4.4.1). Women also have greater longevity and older women are far less likely to be drivers than their male peers.

On this basis, people in the oldest *age of head of household* category are more likely to be female and in single person households, having survived a spouse. Furthermore, female heads of household are also more likely than males to be lone parents with responsibility as primary carer for children. This patterning of household structure has implications for both income levels and the likelihood of car ownership, which will be played out in later multiple regression analysis.

Gender of Head of Household

As outlined in section 4.5.2, the dominant gender for heads of household is male, with men representing their households in 66.4% of the cases in the weighted sample.

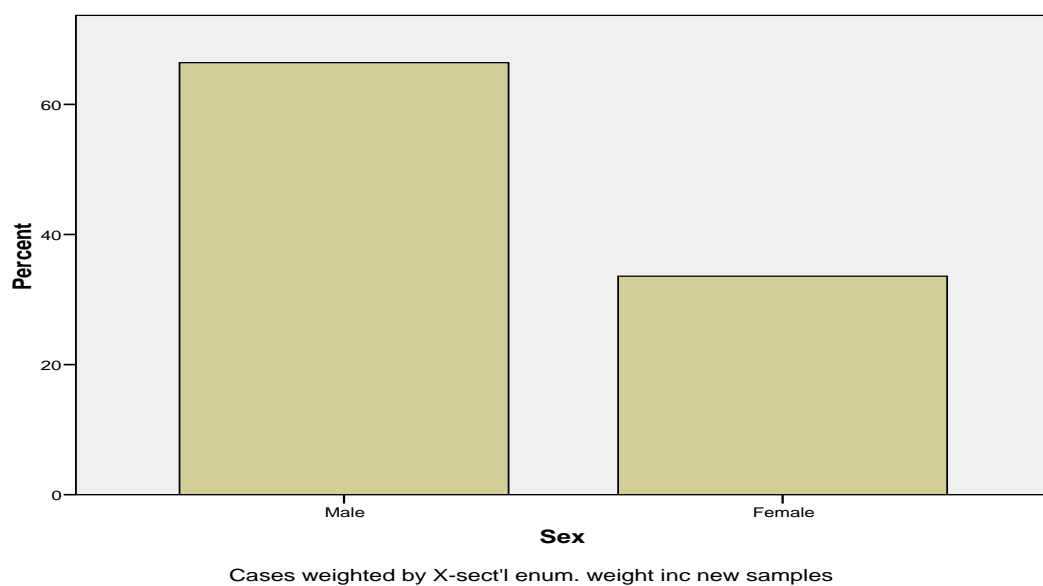


Figure 4.5: Gender of Head of Household - Descriptive Statistics.

Age of Head of Household

Section 4.5.2, on the general characteristics of the sample, introduced age distribution in its continuous form. However, in order to better illustrate the relationship between car ownership and age this analysis employs the variable re-banded into categorical form to exclude heads of household under the age at which they could hold a driving licence.

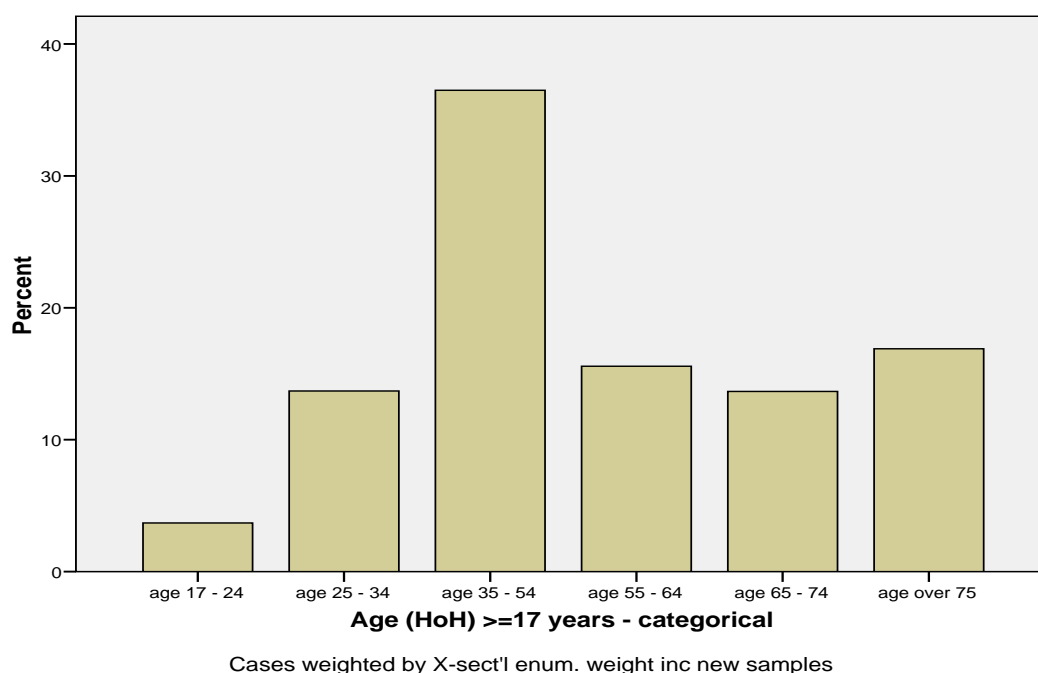


Figure 4.6: Age of Heads of Household (17 years old and above) (Categorical) – descriptive statistics.

Following later bivariate analysis, the middle-aged categories of 35-44 and 45-54 years old were grouped together due to their very similar correlations with car ownership, to act as a reference case for later multivariate analysis.

Number of People Employed in Household

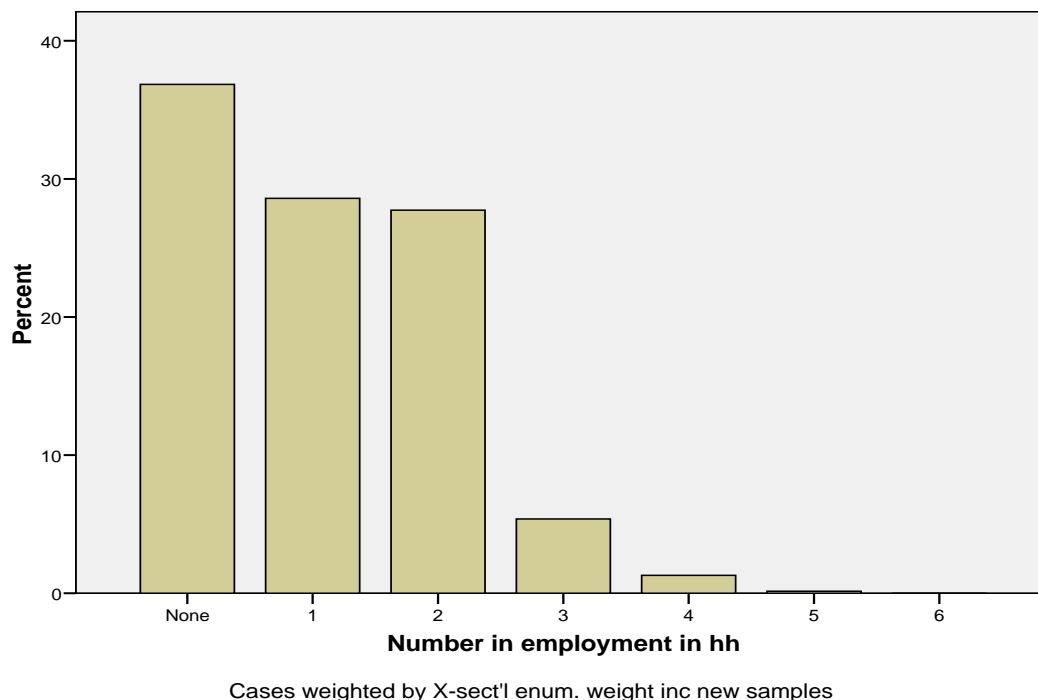


Figure 4.7 Number of People in Employment in the Household

This sample shows that 36.8% of households were without anyone in employment. Note that the sample is drawn from the whole adult population rather than just those of working age. The majority of remaining households has either one or two people in paid employment (28.6% and 27.7% respectively), with relatively few households having 3, 4 and 5 members in work (5.4%, 1.3% and 0,1%).

Number of Children in Household

72.8% of the households in the sample did not include children. 11.8% and 11.6% of households had either one or two children, whilst 3.3% of households included 3 children. Larger households were unusual. In 0.01% of cases, households included either five or six children and in 0.4% of cases, households had four children.

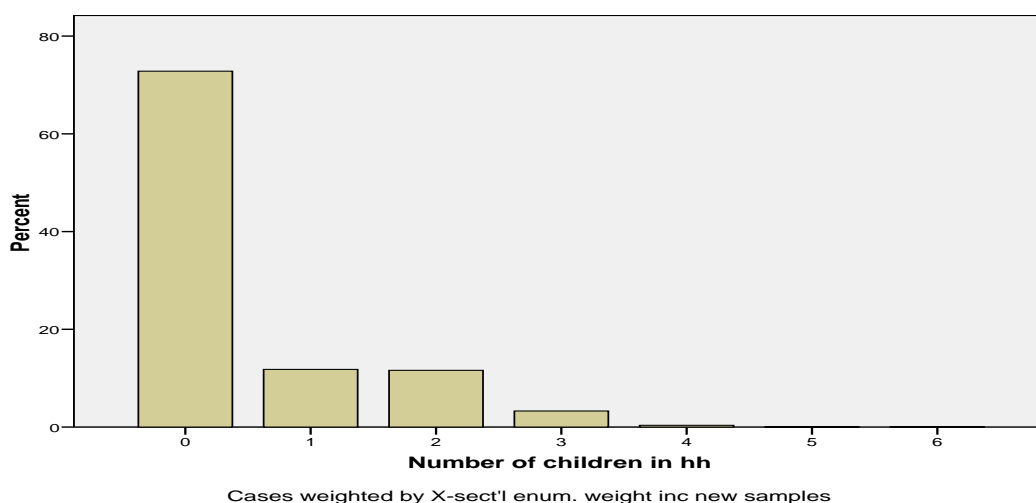


Figure 4.8 Number of Children in Household

4.5.3 Spatial Variables

Although at aggregate level the connection between urbanisation and levels of car ownership is well established, little is known about how built environment impacts upon household car ownership at a more intimate scale. Previous analysis of car ownership using the BHPS has identified area effects by using the *region* variable to create dummy variables and using the rest of England as a reference case (Dargay, 2005). However, as identified previously, there are two difficulties with this approach: firstly, areas of that size can contain urban forms of highly divergent density

within them; secondly, when dealing with large cities or conurbations, there is no recognition of the role of centrality in travel requirements (see Section 3.3.1).

Furthermore, although population density at local authority level has also been employed as a determinant of car ownership, this also provides little indication of the relationship between car ownership and the built environment at a micro-level. Jacobs' ethnography theorises urban density as a key factor contributing to pedestrian interaction, in mixed-use areas mingling visitors with local residents (Section 1.5).

In attempting to understand the role of the built environment in levels of car ownership, variables at three different tiers of spatial scale were included in the analysis (see Table 4.12).

Table 4.12: Three Tiers of Spatial Variables and Theorised Connection with Level of Car Ownership (RC = reference case)

Tier	Variable Label	Variable Name	Theorised Connection
Top	RC: least urbanised quintile second least urbanised quintile middle quintile of urbanisation second most urbanised quintile most urbanised quintile	murb1 murb2 murb3 murb4 murb5	Urbanisation, indicating the degree of urbanisation/ rurality and centrality of each household in the sample
Middle	detached property RC: semi-detached property terraced property flats living in institutional or business premises	mdetach msemi mterr mflats minstbus	Dominant property type in neighbourhood, indicative of ease of access to local amenities other than by walking? Some implications for parking?
Lowest	predominantly detached neighbourhood RC: predominantly semi-detached neighbourhood predominantly terraced neighbourhood predominantly flats in neighbourhood	mdomd mdoms mdomt mdomf	Property type, private space for parking although some flats have dedicated parking

Variables measuring *average distance between properties (in metres)* and *average property size (in square metres)* from the dataset were also included in early modelling but generally proved insignificant and were dropped from later analyses.

The Urbanisation Variables

Additional variables attached to the BHPS for the purposes of this analysis included Mosaic segmentation data from Experian. Mosaic UK (2004) classifies households into 61 types, aggregated into 11 groups, covering every postcode in the UK. The classification is carried out through analysis of 400 variables covering demographics, socio-economics, financial measures, property value and characteristics and location. The location data for each Mosaic type includes an urbanisation index. This index was supplied by Experian so that the Mosaic data in the *w13gpr.sav* dataset could be merged into the sample used in this analysis and then cross-referenced with the urbanisation coding, in order to generate a scale of urbanisation across the UK by quintiles without in any way compromising the anonymity of the BHPS respondents.

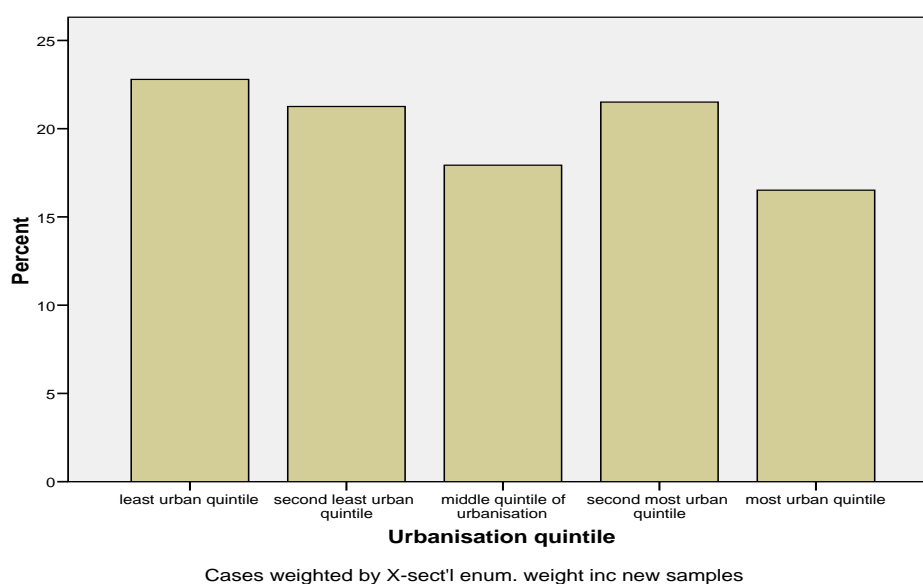
Table 4.13 provides examples of how each urbanisation quintile translates in terms of settlement size and centrality.

Table 4.13 The Urbanisation Quintiles – Indicative Examples

Urbanisation Quintile	Example
Murb1 least urbanised quintile	Farming communities; villages; small market towns far from cities; outer metropolitan areas/ suburbs
Murb2 second least urbanised quintile	Small industrial towns; estates on the edge of towns; outskirts of manufacturing towns
Murb3 middle quintile of urbanisation	Suburbs of smaller towns or older suburbs of large provincial cities; bordering the centres of small market towns and seaside resorts
Murb4 second most urbanised quintile	In and around new towns; outer London suburbs; large provincial cities
Murb5 most urbanised quintile	Central and inner areas of cities and larger towns; inner London neighbourhoods and middle ring of London suburbs; large council schemes in easy walking distance of local shops on major arteries

Source: Experian (2004)

The distribution of households by urbanisation quintile in the weighted sample can be seen in Figure 4.9.

**Figure 4.9: Urbanisation Quintiles - Descriptive Statistics.**

This variable has 33 missing values, reducing the size of the dataset for statistical analysis to $n = 7701$ when the urbanisation variables are employed. The smallest category, comprising 16.5% of valid cases, is drawn from the *most urbanised quintile* in the UK, whilst the *least urban quintile* forms the largest category (22.8% of valid cases). The *middle quintile of urbanisation* covers 17.9% of valid cases whilst the *second most* and *second least urbanised* quintiles comprise 21.5% and 21.3% of valid cases respectively.

The Neighbourhood Form Variables

The data merged into the dataset for this analysis contains a variable listing the dominant property-type in the neighbourhood. This has been restructured into four “neighbourhood form” variables to function as a proxy for the density of the built environment. From least to most dense neighbourhood types, these signify areas of *predominantly detached*, *predominantly semi-detached*, *predominantly terraced* and *predominantly flatted* neighbourhoods²³.

The largest category of the neighbourhood form variables is *predominantly semi-detached*, comprising 33.3% of cases (Figure 4.10). This variable is used as the reference case in later analysis. The smallest proportion of households in this sample live in *predominantly flatted* neighbourhoods - at only 15.0% of cases in the weighted sample, this category occurs with less than half the frequency of the *semi-detached* neighbourhoods.

²³ Detached and semi-detached housing types tend to be predominantly owner-occupied (Burton, 2000b).

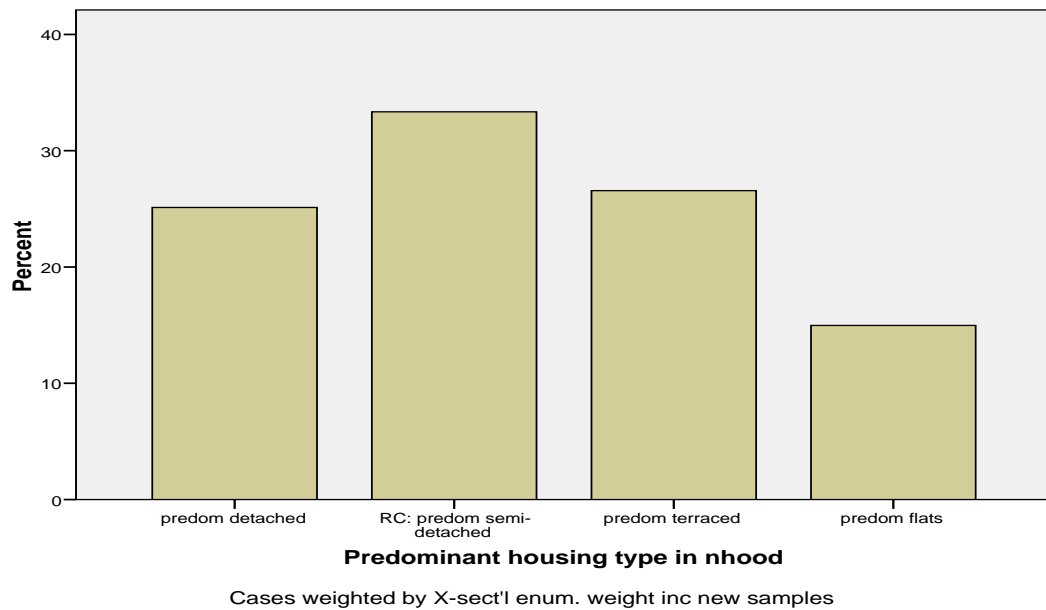


Figure 4.10: Predominant Housing Type in Neighbourhood – Descriptive Statistics.

The Property Type Variables

Beyond capturing data about the density of the neighbourhood, considering car ownership at the spatial scale of property type permits an assessment of how the nature of the built environment at household level might correlate with car ownership. Additional to the four property types identified in the neighbourhood type section above, this set of variables also includes the minor category of living in *institutional or business premises* (2.6% of cases). For the sake of completeness this variable has been included in the analysis but it is not possible to make inferences from the resulting statistics without more detail on what living conditions exist there.

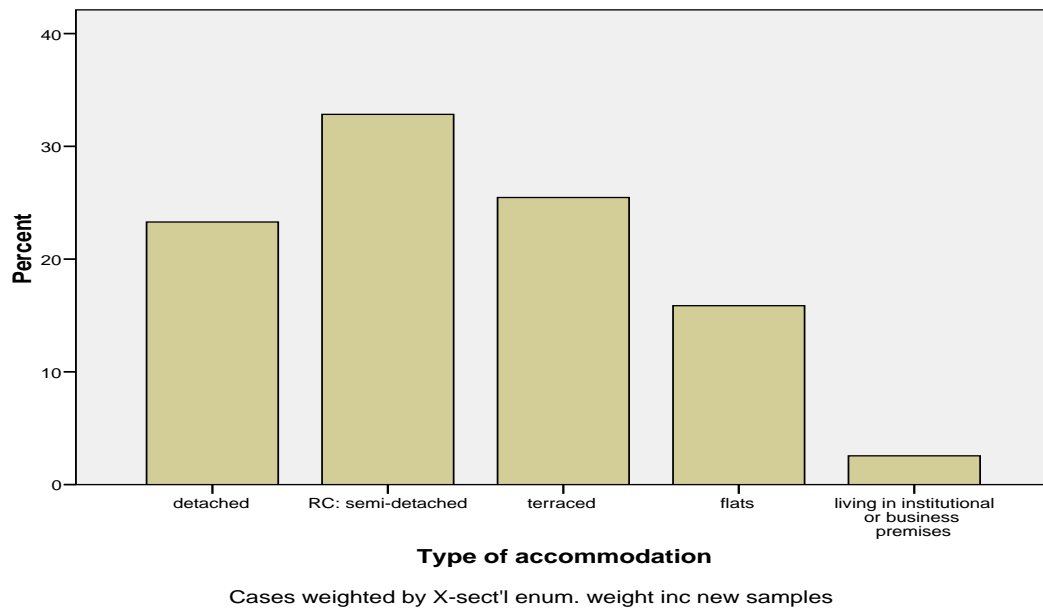


Figure 4.11: Type of Accommodation – Descriptive Statistics

As with neighbourhood type, the largest accommodation category (32.8% of cases) is *semi-detached* properties. This also forms the reference case for comparison with other accommodation types in later analysis. Similar proportions of households in the sample live in *detached* and *terraced* accommodation (23.3% and 25.5%). With the exception of those in institutional or business premises mentioned above, the smallest major accommodation category is that of households living in *flats* (15.9%).

4.5.4 Alternative Formulations Attempted

Section 4.5 has thus far provided descriptive information for variables used in the final model series. However, preliminary modelling was also conducted using a number of alternative formulations. These included modelling with design variables created to indicate social class (using the Registrar General classifications included in the BHPS), tenure, attitudes

towards neighbourhood and environmental issues, perceptions of local amenities, ethnicity, mental health, physical health and household composition (e.g. single, non-elderly; couple, no children; one parent with non-dependent children etc.). Ultimately these were rejected either as having high numbers of missing values, poor significance values, or on the basis of the principle of parsimony (Weinberg and Abramowitz, 2008). Whilst many of the variables tested were highly significant in multiple regression modelling, in order to support a relatively parsimonious modelling process, gender, age and number of people in household employed were identified as the dominant social determinants of car ownership relevant to risk of exclusion. These characteristics summarised the data most effectively using the smallest number of variables.

4.6 Summary

Chapter 4 has detailed how quantitative methods can contribute to answering the research questions and hypotheses generated by the literature review process. The process of specifying dimensions of inclusion and constructing spatial variables has been described in detail. Finally, descriptive statistics relating to all socio-economic, spatial and inclusion variables employed in the analyses have been presented.

5 Understanding Car Ownership: A Quantitative Analysis of Social Inclusion, Demographic Risk Factors and Spatial Scale

5.1 Introduction

This chapter employs quantitative methods to operationalise a concept of social inclusion, exploring the relationship between car ownership and different dimensions of social inclusion whilst controlling for level of urbanisation and demographic risk factors of exclusion. Preliminary analyses deal with the bivariate correlations between the dependent variable and the selected inclusion indicators, demographic data and spatial variables. At this stage, there is a discussion of the dependent variable and selection of functional form. Thereafter multivariate analyses are used to understand the relative importance of social inclusion, demographic risk factors and spatial scale as predictors of level of car ownership. Finally, the findings of the analysis are presented and discussed before the quantitative investigation is contextualised within the wider thesis.

5.2 Variables Used in the Analysis: Bivariate Correlations

In this Section, bivariate correlations with the dependent variable offer a preliminary analysis of the strength and direction of relationships with the inclusion indicators, demographic data and spatial variables.

A test of bivariate correlation generates a correlation coefficient (r) and an associated statistical significance. The coefficient has a value of between zero (indicating no statistical relationship between the two variables

tested) and + or -1 (indicating a strong positive or negative relationship respectively). The associated significance value (p) indicates the probability of falsely rejecting the null of no correlation (Moore and McCabe, 2003); the lower the probability figure, the higher the level of certainty that the test results have not been produced by a freak sample.

Spearman's rho (r_s) is employed as a test that functions effectively with the categorical variables which have been created for the analysis. A significance value of falsely rejecting the null of less than or equal to .05 is taken to indicate a statistically significant relationship. In the case of design variables to be used in later analysis, notes will also be included on which category is to be used as the reference case²⁴. From a technical perspective this category will be excluded from regression analysis in order to prevent perfect multicollinearity (Pryce, 2005).

The section concludes with an overview of the strength and significance of correlations between the dependent variable and the various independent variables which are being used to understand variance in levels of car ownership.

5.2.1 The Social Inclusion Indicators

Understanding the correlation between car ownership and consumption inclusion serves, at least, a dual function: access to such a flexible form of personal transport can itself be seen as a form of inclusion and, as such, monitoring the correlation between these two forms of inclusion is of interest; it also recognises that income is one of the determinants of car ownership in that a certain level of income is required to own or run a private car.

²⁴ For the purposes of interpreting results, the reference case provides the standard category against which all comparisons are made, since odds ratios compare the odds of being in one category against the odds of being in another (Gilbert, 1993).

Table 5.1 Theorised Relationship of Social Inclusion Outcome Indicators to Level of Household Car Ownership

Dimension of Inclusion	Theorised Relationship with Household Car Ownership
Consumption inclusion	<p>Predictor: consumption inclusion affords access to car ownership for both mobility and status.</p> <p>Determinant: the financial resources to purchase, maintain and fuel a household are a determinant of car ownership.</p>
Production inclusion	<p>Predictor: Despite the advent of virtual mobility, being involved in socially productive activities is likely to include physical mobility requirements. In particular, working, managing a household and having childcare responsibilities could require multiple destinations which might be time consuming or difficult to access without private transport.</p>
Civic inclusion	<p>Predictor: Activities over and above working and household obligations which might be difficult or time consuming to access without private transport.</p>
Social interaction inclusion	<p>Predictor: Activities over and above working and household obligations which might be difficult or time consuming to access without private transport.</p>

Consumption Inclusion (*Economic Consumption*)

The statistical relationship between consumption inclusion and car ownership is illustrated below in Figure 5.1, illustrating the non-parametric correlations between the car ownership and consumption inclusion variables.

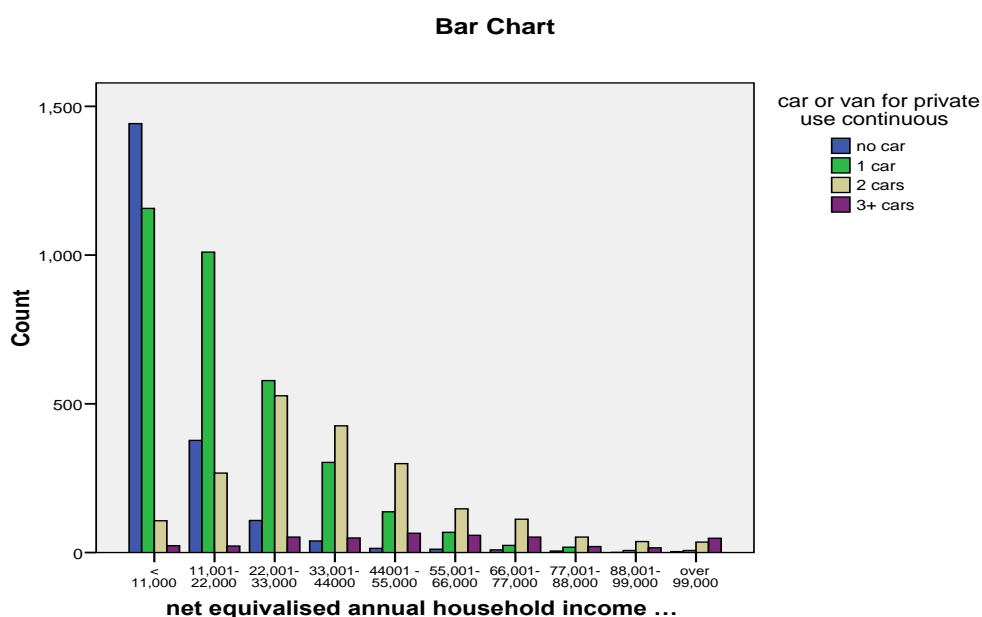


Figure 5.1: Level of Car Ownership and Net Equivalised Annual Household Income

Within the excluded status category, the majority of households (52.8%) do not own a car. The next-largest grouping of cases, also sizeable, comprising 42.4% of the sample, has *1 car* per household. Having *2 cars* per household in the ‘excluded’ income category is by comparison very unusual. Only 3.9% of households fall into this category. There is, however, a tiny minority of cases (0.8%), which, despite falling into the lowest equivalised net annual income banding, have *3+ cars*.

Moving to the second-lowest consumption inclusion band - the *£11,001-£22,000* category - the pattern of car ownership changes quite dramatically. The highest frequency distribution belongs to households with *1 car* (60.3% of all cases in the category). The populations of the *0 cars* and *2 cars* categories are both considerably smaller, at 22.5% and 15.9%

respectively, whilst the *3+cars* category rises to include 1.3% of the cases in the income bracket just beyond the *excluded* category.

By the next income category (£22,001 - £33,000), at only 8.5% of cases in the grouping, households without a car are a relative rarity and the frequency of households with either *1* or *2 cars* (45.7% and 41.7%) has moved closer together. The number of cases in the *3+cars* rises again to 4.1% of the income grouping.

After this point, a pattern emerges of *0 cars* as the lowest-frequency count per income grouping, with a higher count for *1 car* and a higher count again for *2 cars*. The interval between the frequency of *1 car* and *2 car* households increases as income-level increases. The frequency of *3+car* households maintains a trend of increasing as income level increases. By the £77,001 - £88,000 income band, the number of households with *3+cars* exceeds the number of households with only *1 car* and at the highest income band *3+cars* is the most common response (51.6% of cases). Conversely, once equivalised net annual household income in this sample exceeds £33,001, the proportion of households with *0 cars* does not exceed 5.3%²⁵.

Production Inclusion (*Economic Production*)

Bivariate analysis shows the dominant level of car ownership for the ‘excluded’ group on the *consumption inclusion* dimension was *0 cars*. This is also the case for the *full time student*, *family care*, *long-term sick/disabled* and *retired over state pension age* groupings. Of the ‘excluded’ groups of working age, *unemployed* and *long-term sick/disabled*, only a small percentage have *2 cars* per household (11.1%

²⁵ In the second-highest income category (£88,001 - 99,000), there are no cases of a household without a car in the weighted sample although this is a relatively small group n = 60.

and 8.9% respectively) and even fewer have 3 *plus cars* (1.1% and 0.3% respectively).

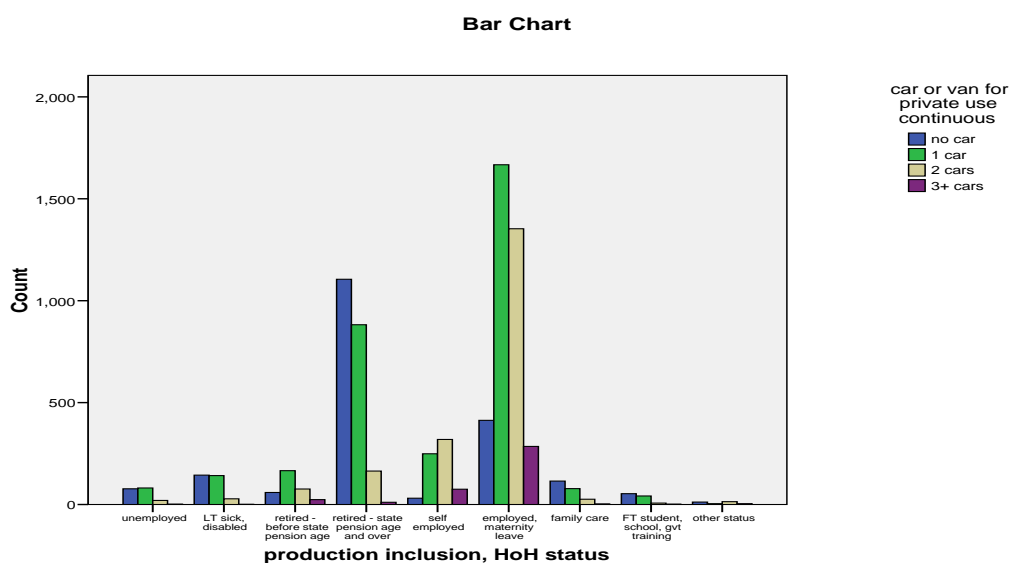


Figure 5.2: Level of Car Ownership and Production inclusion

However, for both of these groupings the total percentage of households with 0 cars is very close to that with 1 car; 42.8% of households in the sample where the head is unemployed have 0 cars and 45.0% have 1 car; in the *long-term sick/disabled* category, 45.7% of cases have 0 cars and 45.1% have 1 car. This is a patterning of ownership that does not obviously echo any of the consumption inclusion distributions in Figure 5.1. The only category where 0 cars was the lowest grouping was *self-employed*, with just 4.6% of self-employed heads of household in the sample being without a car. This was also the only category where 2 cars was the most prevalent grouping of the dependent variable (47.3 % of cases), following the distribution pattern of the higher-earning income increments (those earning over £44,000 (Figure 5.1).

The differing patterns in the cross-tabulations between consumption inclusion/ car ownership and production inclusion/ car ownership hint that participation in productive activities might tip the balance between

conscious and unconscious car dependence - effectively between needing and wanting a private car.

Civic Inclusion (*Political Engagement*)

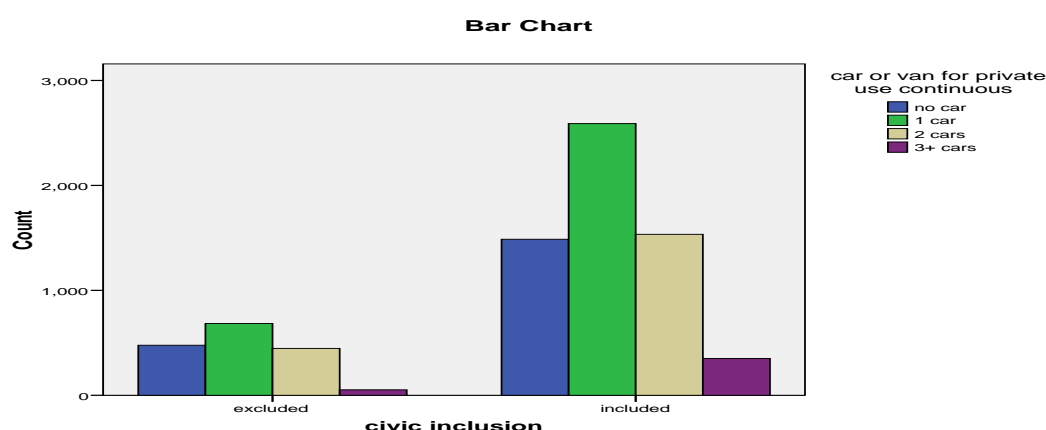


Figure 5.3: Level of Car Ownership and Civic Inclusion

For both civically ‘included’ and ‘excluded’ categories, the smallest grouping is 3+ cars, comprising 3.1% of ‘excluded’ and 5.9% of ‘included’ cases. The grouping with the greatest frequency of cases (41.2% ‘excluded’ and 43.4% ‘included’) is of households with access to 1 car. The second-smallest grouping of the civically included category is 0 cars, where ‘excluded’ and ‘included’ categories have 24.9% of cases, against 25.7% of cases in the weighted sample where included households have 2 cars. For the civically ‘excluded’ category, 26.9% of the households have 2 cars and 28.7% have 0 cars, but overall the frequency of car ownership is very similarly distributed within both ‘included’ and ‘excluded’ categories of the indicator.

Social Interaction Inclusion

The cross-tabulation with household car ownership shows a similar pattern of frequency distribution between the included and excluded to that seen with the civic inclusion indicator.

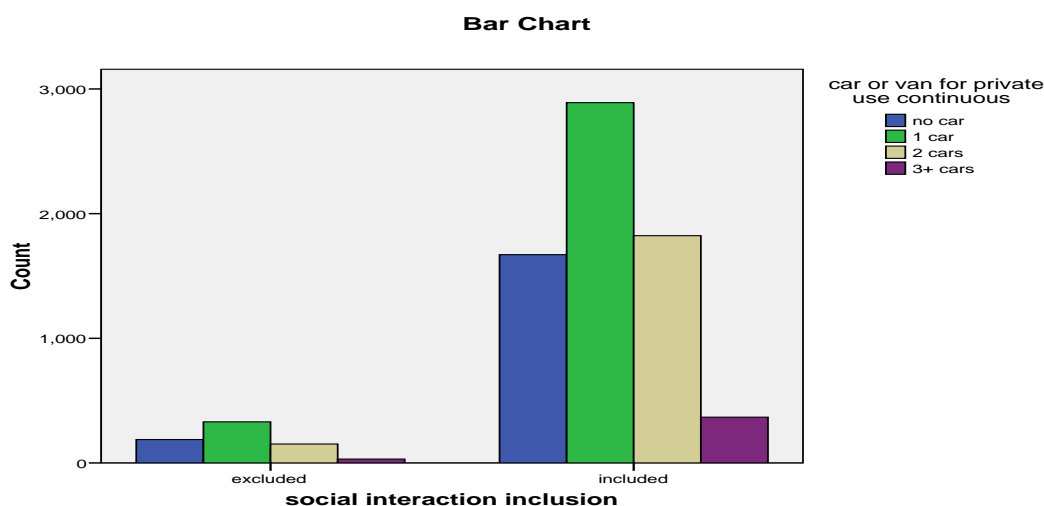


Figure 5.4: Cross-tabulations of Social Interaction Indicator with Levels of Car Ownership.

Again, as might be anticipated, the frequency of households with access to 3+ cars forms the smallest grouping in both categories of the *social interaction inclusion* indicator, comprising 4.4% of excluded and 5.4% of included cases in the weighted sample. Similarly, as with the *civic inclusion* indicator, having access to 1 car was the most common status for households both ‘included’ and ‘excluded’ on the *social interaction* indicator (47.1% and 42.8% of cases respectively). Likewise, the percentage of households with 0 cars and with 2 cars was similar for each category on the indicator, within a range of just over 5%: of the ‘excluded’ households 26.8% of cases had 0 cars and 21.7% had 2 cars; of the ‘included’

households, 24.8% of cases had 0 cars and 27.0% had 2 cars. For both *social interaction* and *civic inclusion* indicators the ‘excluded’ pattern of frequency distribution for household car ownership is similar to the ‘included’ distribution, suggesting that car ownership is not likely to play a major part in either dimension of inclusion as formulated here. Furthermore, although the frequency distributions for both ‘included’ and ‘excluded’ categories of car ownership level are similar across the *social interaction* and *civic inclusion* indicators they do not particular recall any of the frequency distribution patterns from the *consumption inclusion* cross-tabulations in Figure 5.2. From this it might be concluded that although the relationship between *social interaction* and *civic inclusion* dimensions does not initially appear to be strongly related to level of car ownership, only the ‘excluded’ and very high income distributions follow strikingly different patterns.

Car Ownership and the Social Inclusion Indicators: Bivariate Correlations

A one-tailed test, in anticipation of a directional relationship between car ownership and each of the social inclusion indicators, provides confirmation of whether any relationships between the two variables under study are statistically significant or are as a result of chance. Within this sample the car ownership variable had a statistically significant relationship to all but one of the social inclusion indicators (the exception being *production inclusion: other status*). The results of the Spearman’s rho test are presented in Table 5.2.

Table 5.2 Inclusion Indicators - Bivariate Correlations

Group Inclusion Indicators	Variable	Spearman's rho Correlation Coefficient	Significance (1-tailed)	N
Civic Inclusion	Civic Inclusion	1.038**	.001	7167
Social Interaction Inclusion	Social Interaction Inclusion	.038(**)	.001	7018
Consumption Inclusion	RC:net equivalised annual income 0-11,000	-.525(**)	.000	7275
Consumption Inclusion	net equivalised annual income 11,001-22,000	-.088(**)	.000	7275
Consumption Inclusion	net equivalised annual income 22,001-33,000	.176(**)	.000	7275
Consumption Inclusion	net equivalised annual income 33,001-44000	.207(**)	.000	7275
Consumption Inclusion	net equivalised annual income 44,001-55000	.224(**)	.000	7275
Consumption Inclusion	net equivalised annual income 55,001-66,000	.173(**)	.000	7275
Consumption Inclusion	net equivalised annual income 66,001- 77,000	.170(**)	.000	7275
Consumption Inclusion	net equivalised annual income 77,001- 88,000	.105(**)	.000	7275
Consumption Inclusion	net equivalised annual income 88,001- 99,000	.105(**)	.000	7275
Consumption Inclusion	net equivalised annual income > 99,001	.144(**)	.000	7275
Production Inclusion	Unemployed	-.074(**)	.000	7275
Production Inclusion	LT sick, disabled	-.111(**)	.000	7275
Production Inclusion	retired -before state pension age	.022(*)	.028	7275
Production Inclusion	Retired - state pension age and over	-.399(**)	.000	7275
Production Inclusion	self-employed	.201(**)	.000	7275
Production Inclusion	RC: employed	.347(**)	.000	7275
Production Inclusion	family care	-.101(**)	.000	7275
Production Inclusion	FT student, school, government training	-.070(**)	.000	7275
Production Inclusion	other status	.013	.140	7275

* Correlation is significant at the 0.05 level (1-tailed). ** Correlation is significant at the 0.01 level (1-tailed).

All the bivariate correlations tested are significant, with the *social interaction* and *civic inclusion* indicators having a level of $p = .001$ and the income and production inclusion indicators proving statistically significant to $p = .0001$. However, the indicators designed to reflect the dimensions of economic consumption and economic production (*consumption inclusion* and *production inclusion* for the purposes of this analysis) do not interact in a straightforward manner when applied to car ownership. Correlations between car ownership and the *consumption* and *production inclusion* indicators are therefore discussed using their disaggregated components. The components of the *social interaction* and *civic inclusion* indicators all behave in a similar manner, so correlations with car ownership are described in terms of the indicators as a whole.

As hypothesised, the *social interaction* and *civic inclusion* indicators both demonstrate a positive relationship with car ownership, as both indicators have an r_s figure of .038, suggesting that both *social interaction inclusion* and *civic inclusion* are facilitated by access to a private car and inhibited by lack of access. However, although statistically significant, this is nonetheless a very weak positive relationship.

The situation with the other two indicators is more complex in that the disaggregated components of each indicator have relationships with car ownership in different directions.

As originally conceived by Burchardt *et al.*, the production inclusion indicator designates cases as excluded where the head of household is:

- Unemployed
- Long-term sick or disabled
- Retired below state pension age

- Of another employment status

Understanding car ownership in terms of need - as something necessary to or facilitating productive participation in society - supports the hypothesis that at least the first three of the above categories would be less likely to live in households with higher levels of car ownership²⁶. This is the case with the first two groupings: cases with *unemployed* or *long-term sick/disabled* heads of household demonstrate a negative bivariate correlation with car ownership on the *production* dimension ($r_s = -.074$ and $r_s = -.111$ respectively). The r_s figures close to zero (rather than an absolute value of 1) indicate only weak relationships; speculatively, the relationship might be weaker with regard to unemployment and car ownership possibly in that the source variable offers only current status rather than any indication of duration of unemployment.

The third of the excluded categories on the dimension of *production inclusion*, retired before state pension age, confounds the hypothesis showing a positive relationship with car ownership, albeit that a test statistic of $r_s = 0.22$ shows only a very weak relationship.

Conversely, three of the 'included' categories, which were hypothesised as having a positive relationship with car ownership on the dimension of *production inclusion*, are not associated positively with car ownership. Cases where the head of household is *retired over state pension age*, responsible for *family care* or on a *student/government training scheme*, actually demonstrate a negative bivariate correlation. For those in *family care* and who are *students/government trainees* the bivariate correlation, although statistically significant, is very weak ($r_s = -.101$ and $r_s = -.070$ respectively).

²⁶ No indication is given in BHPS manuals of what 'other employment status' might entail, therefore it is not possible to comment on the category.

An added complication with the category of heads of household *retired over state pension age* is that its bivariate relationship with car ownership pulls in the opposite direction from the cases where the head of household is *retired before state pension age* and therefore the opposite direction from the relationship hypothesised. Furthermore, although not in absolute terms an especially strong correlation, the relationship between car ownership and heads of household *retired over state pension age* has the greatest magnitude of all categories in the *production* dimension, with $r_s = -.399$.

The remaining categories designated as included on the *production* dimension, *employed* and *self-employed*, also have moderate-level correlations with car ownership, although in these cases positive relationships ($r_s = .201$ and $r_s = .347$ respectively).

Due to complexities with the disaggregated components, bivariate correlations within the *consumption inclusion* indicator are also presented as discrete figures rather than using the indicator in its entirety. The correlation between car ownership and the excluded category from the consumption inclusion indicator (*income below £11,000*) has not only the greatest absolute magnitude from all the inclusion indicators, with a Spearman's rho of $r_s = -.525$, it is the only category across the social inclusion indicators which shows a truly strong correlation. The next income category (*income £11,001 - £22,000*) also shares a negative correlation with car ownership - although in this case ($r_s = -.088$) the relationship is very weak. Thereafter, all of the consumption inclusion categories correlate positively with the car ownership variable. The strength of the correlation grows until it peaks with the *£33,001-£44,000* category and then shows a trend of diminishing towards the upper categories, reflecting the non-linear relationship between income and levels of car ownership.

5.2.2 The Demographic Risk Factor Variables

Gender of Head of Household

Cross-tabulated by gender, the level of household car ownership changes in distribution pattern as well as in scale.

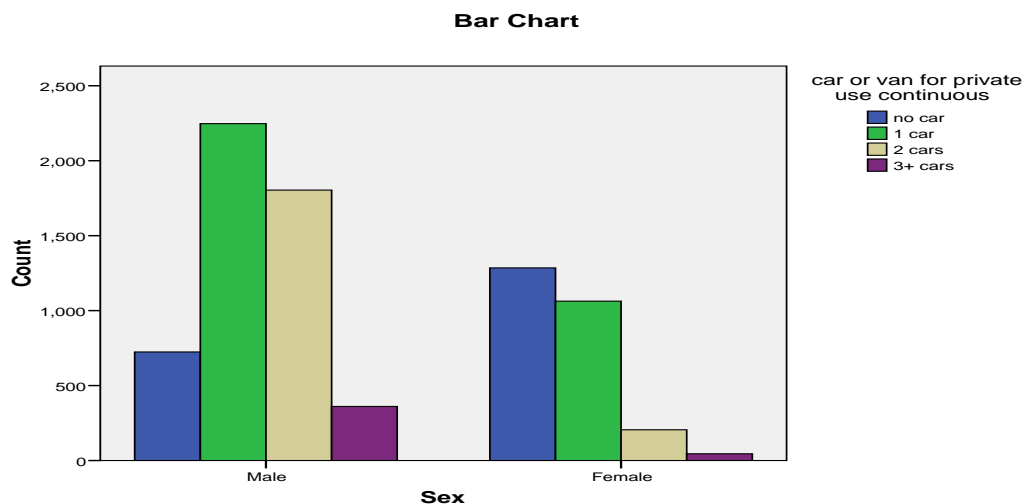


Figure 5.5: Cross-tabulation of Gender with Level of Household Car Ownership.

With a *male* head of household, the largest grouping of cases has access to *1 car* (43.8% of the weighted sample), whilst the second-largest grouping has access to *2 cars* (35.1%). Where there is a *female* head of household, the largest grouping is for *0 cars* (49.5% of the weighted sample) with *1 car* as the second-largest grouping (40.9%). In contrast, although only 14.1% of cases from the male category have *0 cars*, even fewer cases from the *female* category (7.9%) have *2 cars* in the household. Finally, whilst both categories contain a relatively low number of cases with *3+ cars*, the figure for the male category is again higher (7.0% and 1.7% of cases in the weighted sample respectively).

Age of Head of Household

When cross-tabulated with car ownership, the age categories demonstrate a pattern of households being without a car when the head of household is either very young or very elderly. For age bands 17-24 and 75+ respectively 47.0% and 64.5% of cases in the weighted sample fell into the *0 cars* grouping. Car ownership for these two age categories follows a similar pattern to that seen between car ownership and the ‘excluded’ *consumption inclusion* category (Figure 5.1 with *0 cars* being the dominant category, the *1 car* grouping having a lower frequency, followed by a large drop to the *2 cars* grouping and leaving extremely few households with *3+ cars* (in the case of the very young and very elderly age bands, 0.7% and 0.1% of cases respectively).

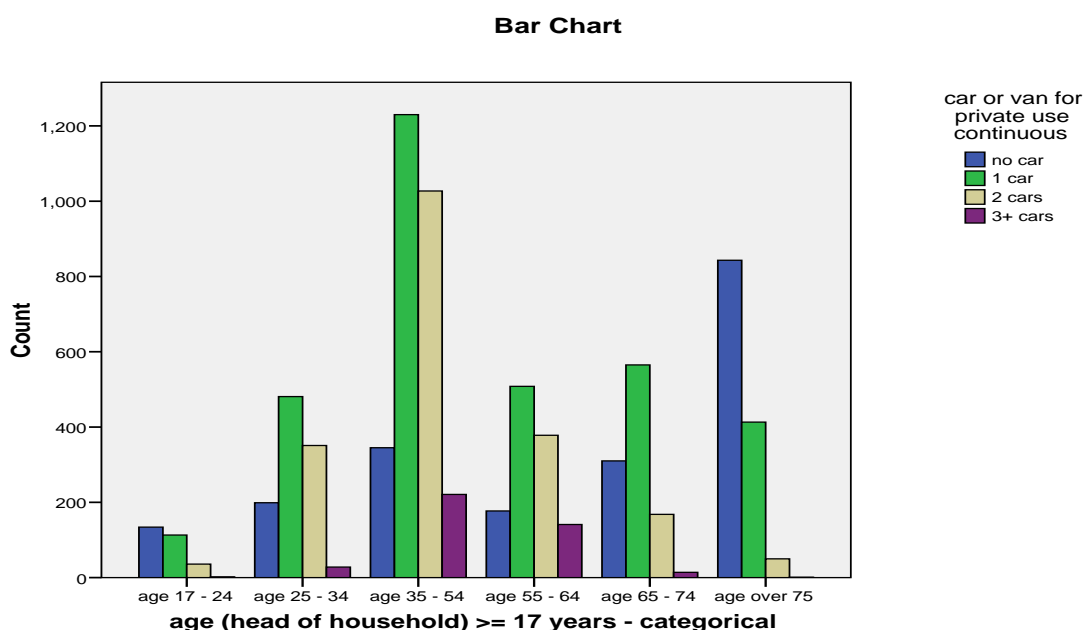


Figure 5.6: Cross-tabulation of Age of Heads of Household (17 years old and above) with Level of Household Car Ownership.

Cross-tabulation of car ownership by age categories shows the majority of the remaining age bands following a pattern of peaking with the *1 car* grouping, followed by a slightly lower frequency for the *2 cars* grouping, a larger drop to the *0 cars* grouping and a small percentage of *3+ car* households forming the lowest frequency grouping. Notably, the exception to this pattern is the *65-74 years* category where, although *1 car* is still the dominant grouping, *0 cars* instead of *2 cars* is the second most frequently occurring level of car access.

Number of People Employed in Households

Due to concerns regarding multicollinearity this variable was tested along with *number of adults in the household* and *number of people in the household*. As the variable with the highest correlation with the dependent variable, *number of employed people in the household* was retained for further analyses.

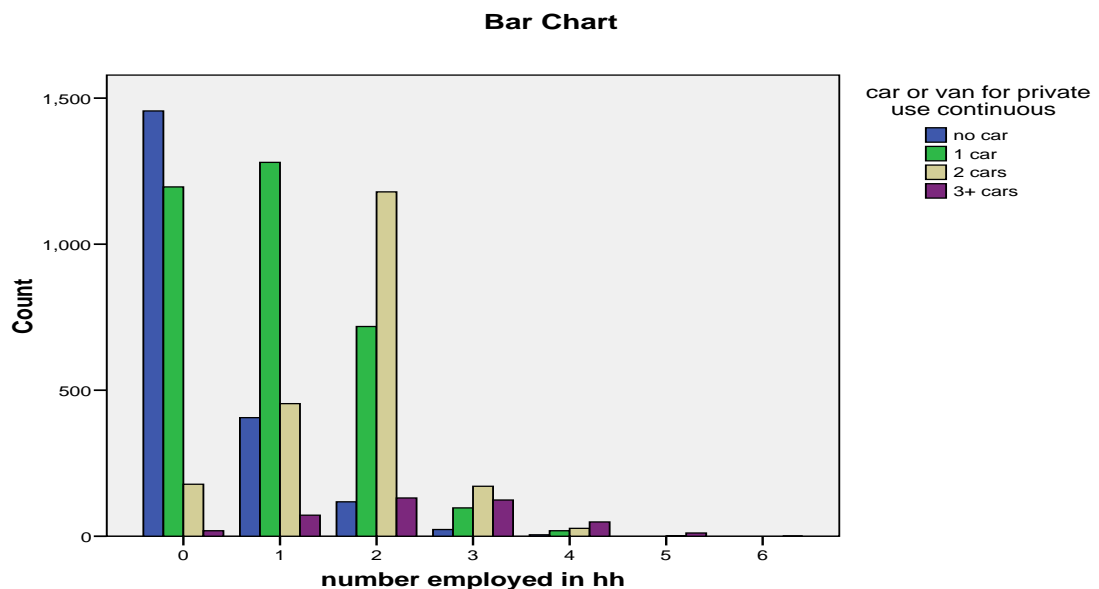


Figure 5.7 Cross-tabulation of Number of People Employed in Household with Level of Household Car Ownership

Figure 5.7 shows that 36.8% of the sample live in households without any adults in employment. 51.5% of those households are with 0 cars and 42% have 1 car. 6.2% and 0.7% have 2 and 3+ cars respectively.

Households with *one adult in employment* comprise the second largest category. 57.9% of these households have 1 car, whilst 20.5% have 2 cars. 18.4% of the *one adult in employment* households are without a car and only 3.3% have 3+ cars.

For the 27.7% of households in the sample with *two adults in employment*, 54.9% have 2 cars and 33.9% have 1 car. This is also the first category where there are more households with 3+ cars (6.1%) than with 0 cars (5.5%). Households with three or more people in employment also follow this pattern, with car-less households becoming increasingly rare as the number of adults in employment increases (see Table 5.3).

Table 5.3 Cars per Household Cross-tabulated with Number of Adults in Employment

Number of adults in household employed	% households with car or van for private use continuous				% of Total Sample
	No car	1 car	2 cars	3+ cars	
0	51.1%	42.0%	6.2%	.7%	36.8%
1	18.4%	57.9%	20.5%	3.3%	28.6%
2	5.5%	33.5%	54.9%	6.1%	27.7%
3	5.5%	23.4%	41.2%	29.9%	5.4%
4	5.0%	19.0%	27.0%	49.0%	1.3%
5	.0%	.0%	8.3%	91.7%	.2%

Number of Children in Household

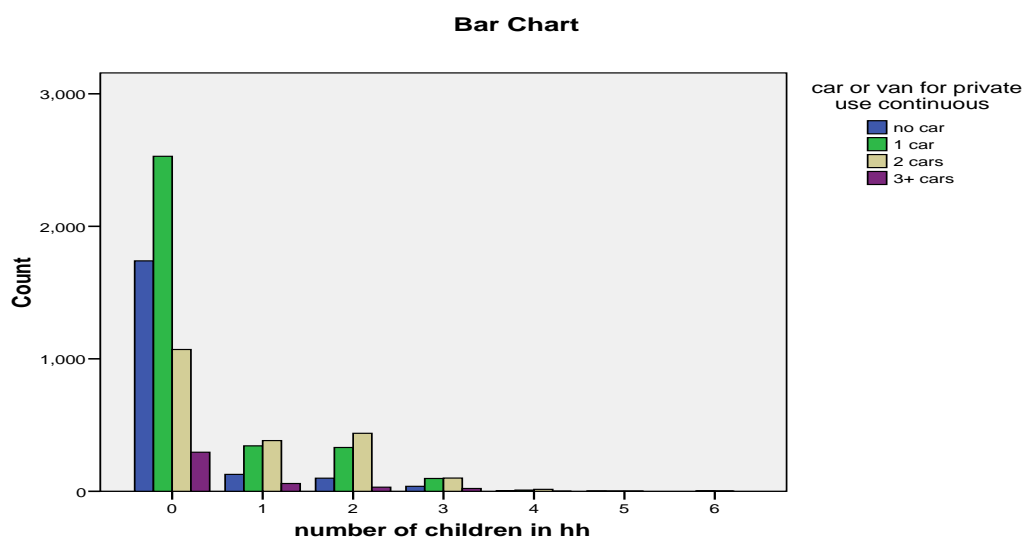


Figure 5.8 Cross-tabulation of Number of Children in Household with Level of Household Car Ownership

A large majority (72.8%) of the households in the sample are without children (Table 5.4). Of these households, 30.9% are without a car, whilst 44.9% have one vehicle and 19% and 5.2% respectively have 2 and 3+ cars. Households with one, two or three children show a pattern of the greatest percentage having 2 cars, then 1 car.

Table 5.4 Cars per Household Cross-tabulated with Number of Children in Household

Number of children in household	% of households with car or van for private use continuous				% of Total Sample
	no car	1 car	2 cars	3+ cars	
0	30.9%	44.9%	19.0%	5.2%	72.8%
1	14.0%	37.6%	41.9%	6.5%	11.8%
2	11.0%	36.8%	48.7%	3.4%	11.6%
3	14.8%	37.9%	39.1%	8.2%	3.3%
4	14.3%	32.1%	53.6%	.0%	.4%
5	50.0%	25.0%	25.0%	.0%	.1%
6	.0%	60.0%	40.0%	.0%	.1%

Although this suggests that having children might be positively associated with car ownership, there is also a tension between car ownership being particularly useful for households with children and expense: none of the households in the sample with three or more children own 3+ cars.

Car Ownership and the Demographic Risk Factors: Bivariate Correlations

All bivariate relationships between car ownership and this group of variables are highly significant with $p < .001$. *Number of employed people in household* has the strongest absolute correlation, with a positive relationship with level of household car ownership. The next strongest relationships were with HoH gender, *female* HoH showing a negative correlation with level of household car ownership. Age variables follow an arc indicating non-linear relationship with the dependent variable so that the youngest and oldest HoH age categories demonstrate a negative impact on household car ownership. The most modest effect is with HoH age 24-35 of $-.050$. These correlations carry implications for the ‘retired’ *production inclusion* categories in that inclusion indicators insofar as the 65-74 age band shows only a weak negative correlation with level of household car ownership ($r_s = -.097$), not that far removed from the $r_s = .22$ relationship of

the *retired before state pension age* category. However, the age effect increases to $-.392$ for the *age 75+* band, suggesting that age rather than retirement status is the key driver of the relationship.

Table 5.5: Demographic Risk Factors and Household Car Ownership – Bivariate Correlations.

Risk Factor Variable	Spearman's rho Correlation Coefficient	Significance (1-tailed)	N
Male	.423(**)	.000	7275
Female	-.423(**)	.000	7275
HoH under 17 years	NA	NA	7275
age 17 - 24	-.106(**)	.000	7275
age 25 - 34	.050(**)	.000	7275
age 35 - 44	.164(**)	.000	7275
age 45 - 54	.167(**)	.000	7275
age 55 - 64	.148(**)	.000	7275
age 65 - 74	-.097(**)	.000	7275
age over 75	-.392(**)	.000	7275
No. employed in household	.579(**)	.000	7275
No. of people in household	.523(**)	.000	7275
No. of children in household	.242(**)	.000	7275
No. of adults in household	.561(**)	.000	7275

5.2.3 Spatial Determinants Variables

This section introduces descriptive statistics and bivariate correlations for each category of spatial variables retained in later analyses.

The Urbanisation Variables

These quintiles, derived from Experian data, provide a measure of urban centrality, from the most urban quintile representing centrality within larger cities or metropolitan areas to the least urban, indicating individual properties or small settlements in rural areas or peripheral urban areas

effectively isolated by poor connectivity or lack of amenities (see Table 4.13).

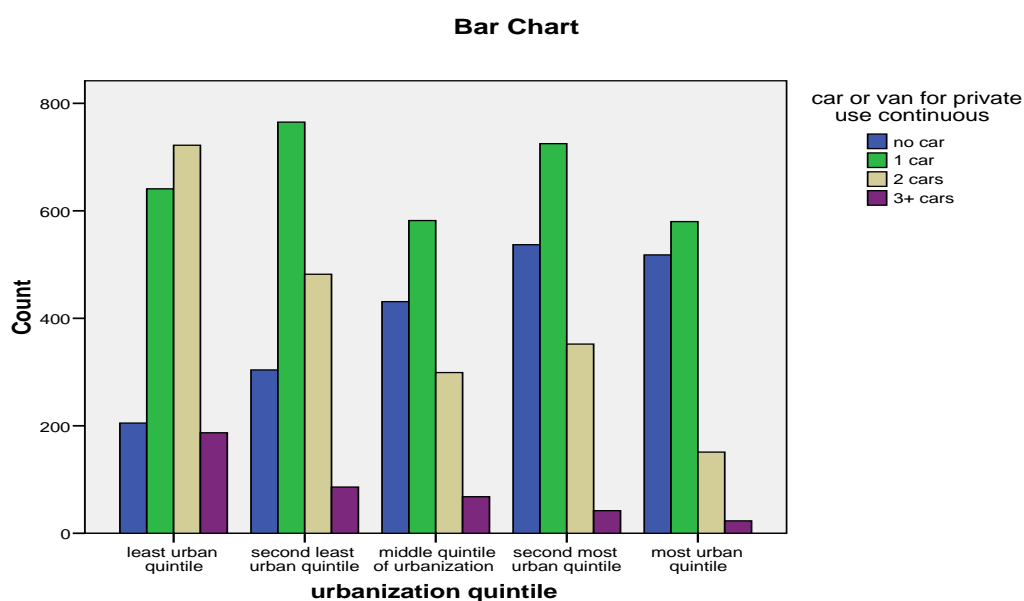


Figure 5.9: Cross-tabulation of Urbanisation Quintiles with Level of Household Car Ownership.

The cross-tabulation Figure 5.9 indicates that the majority of cases, covering the middle and two upper quintiles of urbanisation, show a distribution of car ownership that peaks with the *1 car* grouping, followed by the *0 cars* grouping, with the *3+ car* grouping having the lowest and the *two car* grouping the second-lowest frequency of cases. The higher the degree of urbanisation, the greater the fall from the *2 cars* to the *3+ cars* figures.

In the case of the *second least urban quintile*, the cross-tabulation with car ownership deviates from the pattern set in more urban areas in that more households in the sample have access to *2 cars* than fall into the *0 cars*

grouping (29.4% against 18.6% of valid cases). In the *least urban quintile*, the pattern of household car ownership changes again. This is the only quintile where the proportion of households with 2 cars outstrips the proportion with 1 car (41.1% against 36.5% of valid cases respectively). Furthermore, in the *least urban quintile* in the sample, the frequency of cases with 3+ cars approaches that of households without a car (10.7% and 11.7% of valid cases).

The Neighbourhood Form Variables

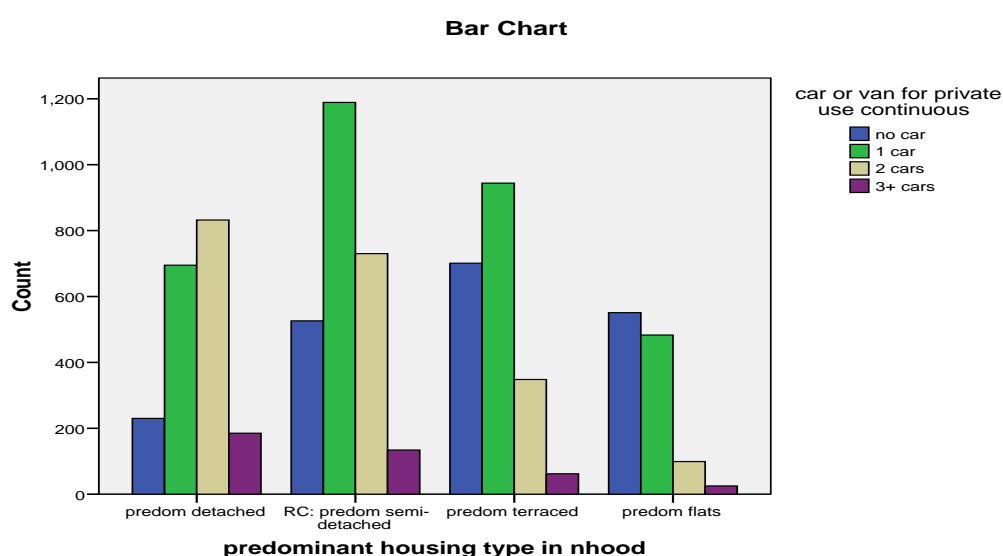


Figure 5.10: Cross-tabulation of Predominant Housing Type in Neighbourhood with Level of Household Car Ownership

Figure 5.10 shows that each neighbourhood type has a distinct pattern of car ownership. For all neighbourhood types, the 3+cars grouping has the lowest frequency of cases; although as might be expected the percentage of cases represented in the 3+cars grouping decreases as the local neighbourhoods becomes less dense (from 9.5% of cases in the

predominantly detached neighbourhoods down to 2.2% of cases in the neighbourhoods where flats are the predominant housing type).

The *predominantly semi-detached* and *terraced* neighbourhoods have a similar profile in that having 1 car is the largest grouping (46.1% and 45.9% of households respectively) and both have very low proportions of housing with 3+ cars (5.2% and 3.0% of cases). However, they differ in that the second-largest grouping of car ownership level in *predominantly terraced* neighbourhoods is 0 cars (28.3% of cases) whilst for the *predominantly semi-detached* neighbourhoods it is 2 cars (34.1% of cases).

Predominantly flatted neighbourhoods have by far the highest proportion of cases where there is no car access in the household (47.6% against 11.8%, 20.4% and 34.1% for *predominantly detached*, *semi-detached* and *terraced* neighbourhoods respectively). The figure for the 1 car grouping of households in *predominantly flatted* areas is not much lower - 41.7%. Consequently there is a large drop to the 2 cars and 3+ car statistics, representing 8.5% and 2.2% of cases in the category.

The Property Type Variables

The cross-tabulation chart overleaf reinforces the difficulties of drawing inferences from the *institutional and business accommodation* category: it has the highest proportion of households with 0 cars (53%) but also a relatively high proportion of households with 3+ cars (4.0% of cases in the category, falling between *semi-detached* accommodation at 5.2% and *terraced* accommodation at 3.4%). Otherwise, the patterning of car ownership within categories is strikingly similar to the patterning within neighbourhood types. This might simply indicate that detached properties, for example, are found in predominantly detached neighbourhoods.

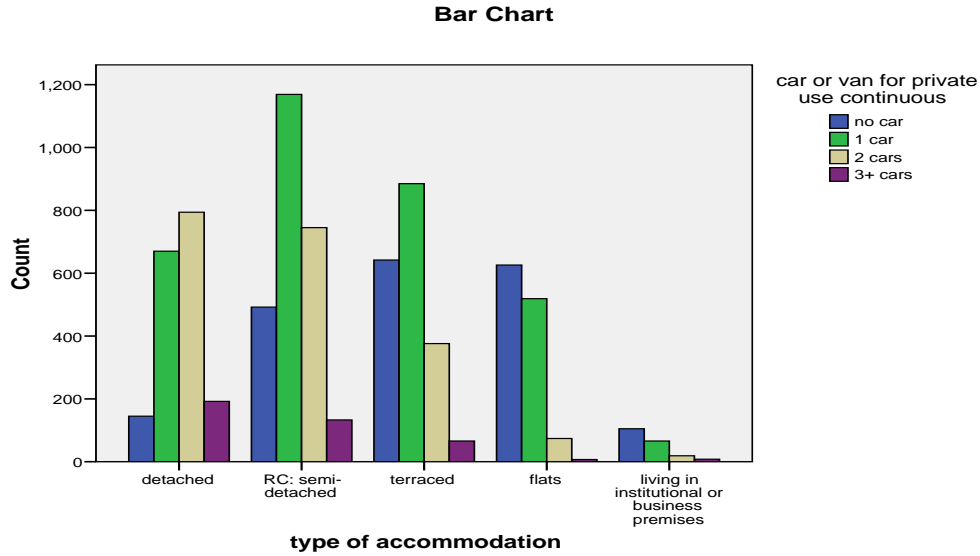


Figure 5.11: Cross-tabulation of Type of Accommodation with Level of Household Car Ownership.

However, as Table 5.6 indicates, accommodation type and neighbourhood type differ in a substantial minority of cases, suggesting that the relative importance of neighbourhood and accommodation densities should be tested.

Table 5.6: Cross-tabulation of Accommodation Type with Neighbourhood Type

	Predominant housing type in neighbourhood				
Type of accommodation	Detached	Semi-detached	Terraced	Flatted	Total
Detached	1336	308	101	56	1801
RC: semi-detached	350	1800	318	71	2539
Terraced	112	325	1371	161	1969
Flats	79	122	222	804	1227
Living in institutional or business premises	65	24	43	66	198
Total	1942	2579	2055	1158	7734

In the light of this similarity, early modelling work tested for interaction effects between accommodation and neighbourhood type. These were used to analyse whether the effect of accommodation on car ownership levels was moderated by the structure of the wider neighbourhood. Interaction terms were created by taking the product of each neighbourhood type and accommodation variable, then including all original and interaction terms within a hierarchically well-formulated model, and comparing model fit when the interaction terms were eliminated (Jaccard, 2001). Since the difference in model fit was not significant, it was concluded that although the distribution of car ownership is similar across the neighbourhood and accommodation categories, they were measuring independent effects which did not significantly interact, so the neighbourhood/ accommodation interaction terms were excluded from further analysis, and the neighbourhood and accommodation variables treated as having independent effects.

Car Ownership and the Spatial Variables: Bivariate Correlations

All of the Spearman's rho tests in the Spatial Variables section are highly significant at $p = .0001$, indicating that it is very unlikely that the correlations reported in this sample are the product of chance. Where the direction of the bivariate correlation changes across different categories, the variables are analysed in their disaggregated components (see Table 5.7).

Table 5.7: Spatial Variables and Household Car Ownership – Bivariate Correlations.

Spatial Scale Variable	Spearman's rho Correlation Coefficient	Significance (1-tailed)	N
RC: least urban quintile	.252(**)	.000	7244
Second least urban quintile	.075(**)	.000	7244
Middle quintile of urbanisation	-.061(**)	.000	7244
Second most urban quintile	-.101(**)	.000	7244
Most urban quintile	-.192(**)	.000	7244
Predominantly detached neighbourhood	.268(**)	.000	7275
Predominantly semi-detached neighbourhood	.071(**)	.000	7275
Predominantly terraced neighbourhood	-.158(**)	.000	7275
Predominantly flats neighbourhood	-.227(**)	.000	7275
Detached property	.302(**)	.000	7275
Semi-detached property	.087(**)	.000	7275
Terraced property	-.121(**)	.000	7275
Flatted property	-.281 (**)	.000	7275

Urbanisation Quintiles

The direction of the effect of the highest spatial scale, the urbanisation quintile, changes just below the middle category. The two least urbanised quintiles show a positive correlation with car ownership, whilst the middle and most urbanised quintiles show a negative correlation. The strength of the correlation increases towards the extreme ends of the spectrum and is least pronounced in the middle quintile of urbanisation ($r_s = -.061$), which shows a very weak negative correlation with car ownership. The strongest absolute correlation is between car ownership and the *least urban* quintile ($r_s = .252$); at the opposite end of the spectrum, the most highly urbanised quintile shows a negative correlation of $r_s = -.192$.

Neighbourhood Type

Both the neighbourhood and accommodation type variables also follow a pattern of displaying a higher magnitude of correlation towards the

extreme ends of the spectrum. As with the urbanisation quintiles, the strongest effect relates to the least dense variable: the predominantly detached neighbourhood variable shows a bivariate correlation of $r_s = .268$ with car ownership; for predominantly flatted neighbourhoods, the Spearman's rho of $r_s = -.227$ indicates a relationship of slightly weaker magnitude in the opposite direction. The variable signalling a predominantly semi-detached neighbourhood, which later acts as the reference case for neighbourhood type, displays only a very weak positive correlation with car ownership ($r_s = .071$) whilst households within a predominantly terraced area show a more marked, albeit still weak correlation ($r_s = -.158$).

Accommodation Type

As might be anticipated given the similar patterns of cross-tabulation, the variables relating to accommodation type bear a similar relationship to the dependent variable as do those relating to neighbourhood. The relationship between *semi-detached* accommodation and level of household car ownership is very weakly positive ($r_s = .087$); like the neighbourhood type variables, this is also the highest frequency category, making an appropriate reference case. Similarly, *detached* accommodation has the strongest correlation and *flatted* accommodation the next strongest with Spearman's rho figures of $r_s = .302$ and $-.281$ respectively.

5.2.4 Summary

Having presented cross-tabulations between car ownership and the spatial variables used in the analysis, this section goes on to provide an assessment of the strength, direction and significance of bivariate correlations between the variables.

Table 5.7 shows statistically significant bivariate correlations with level of household car ownership in order of increasing magnitude. The predictor

variables have been classified according to Pallant's (2001) threefold typology of strength of association. Notably, his minimum threshold for a weak relationship is $r_s = 0.1$ and of the 45 variables examined, 13 fall below that threshold. Furthermore, Moore and McCabe identify values of r approaching 0 as "very weak" (2003, p.128) so relationships below $r_s = .01$ have been included under that heading where they are statistically significant to at least < 0.05 .

Very Weak Relationship

Six of the twelve very weak relationships with the variable for level of household car ownership (*mcarhh*) are from the inclusion indicator grouping. These include the consumption category just above the exclusion threshold (net equivalised annual income of 11,001-22,000) and three of the disaggregated production inclusion variables (Burchardt et al.'s *retired before state pension age* along with the *student* and *unemployed* categories). The latter is somewhat surprising but might be explained by the fact that this is a cross-section giving no information about duration of unemployment and also the asymmetry of vehicle acquisition and relinquishment found by Dargay (2001). Most remarkably, the civic inclusion and social interaction inclusion variables are also in the very weak relationship category, both having a positive relationship of $r_s = .038$.

Of the remaining twelve, four are from the spatial grouping and two from the risk factor grouping. Of the spatial variables, the middle and second-least quintiles of urbanisation show very weak negative and positive relationships with *mcarhh* (respectively $r_s = -.061$ and $r_s = .075$). The *predominantly semi-detached neighbourhood* and *semi-detached property* variables both have very weak positive relationships with *mcarhh*.

The two risk factor variables in the very weak category are both age-related, with *age 25-34* having a very weak positive $r_s = .050$ and *age 65-74*

approaching Pallant's (2001) threshold for a weak relationship with $r_s = -.097$.

The Weak Relationships

Twenty-three of the forty-five variables significantly related to *mcarhh* fall into this category. This includes eight of the nine remaining *consumption inclusion* indicators, (the exception being the 'excluded' *net equivalised annual income below 11.000* variable). As might be anticipated, all of the *consumption inclusion* indicators in this group have positive associations with *mcarhh*.

This category also includes the remainder of the highest tier spatial variables, second most and most urbanised quintile, which have negative associations with *mcarhh* of $-.121$ and $-.192$ respectively and *least urbanised quintile* ($r_s = .252$), which has the strongest bivariate correlation of all the top tier spatial variables. The remaining second tier spatial variables also fall into the weak relationship category. The *predominantly terraced* and *predominantly flatted neighbourhoods* have negative correlations of $r_s = -.158$ and $r_s = -.227$ respectively. The strongest spatial association in the group is the positive relationship between *predominantly detached neighbourhoods* and *mcarhh* ($r_s = .268$).

The *exclusion risk factor* variables demonstrating weak relationships with *mcarhh* include four of the remaining five age-related variables. *Age 17-24* shows a weak negative bivariate correlation with the dependent variable, whilst *ages 35-44*, *45-54* and, to a slightly lesser extent, *age 55-64* all show similar positive correlations ranging from $r_s = .148$ to $r_s = .167$. The final exclusion risk factor variable in the category is *number of children in the household*, relating positively to *mcarhh* at $r_s = .242$.

The Moderate Relationships

Only six of the variables tested were significantly related to *mcarhh* within the moderate strength category. Of these, two were *production inclusion* indicators, one was the last remaining spatial variable, and three were *exclusion risk factor* variables.

The *production inclusion* indicators were *employed* and *retired at state pension age and over*, from Burchardt *et al.*'s 'included' category but, as noted earlier, they correlate differently with the *mcarhh*, with the former having a moderate positive relationship ($r_s = .347$) and the latter a slightly more powerful negative correlation ($r_s = -.399$).

The most powerfully correlated spatial variable was at the lowest geographic tier, that of *detached property*, positively correlated with $r_s = .302$.

The three *exclusion risk factor* variables in this category were *aged over 75*, the most powerful of the age-related correlations, demonstrating a negative relationship of $r_s = -.392$, and the two gender variables which have positive and negative relationships with *mcarhh* for the male and female variables respectively.

The Strong Relationships

Pallant's threshold for a strong relationship is a bivariate correlation over an absolute value of .500. Only four of the forty-five variables tested fell into this category. Three of these were *exclusion risk factor* variables. The fourth was the 'excluded' category of the *consumption inclusion* indicator, *net equivalised income below 11,000*, which with $r_s = .525$ demonstrated the second most powerful bivariate correlation with *mcarhh*.

The remaining variables in the strong relationship category were *number of people in the household*, *number of adults in the household* and *number employed in the household*, all demonstrating positive bivariate correlations with *mcarhh*. The most powerful bivariate correlation tested was the *exclusion risk factor* variable, *number employed in the household* $r_s = .57$

Table 5.8: Summary Bivariate Correlations with Level of Household Car Ownership in Order of Increasing Magnitude

Strength of bivariate association with level of car ownership	Group Inclusion Indicators	Variable	Spearman's rho Correlation Coefficient
VERY WEAK	<i>Production Inclusion</i>	<i>Other status</i>	.013
	Production Inclusion	Retired -before state pension age	.022(*)
	Civic Inclusion	Civic Inclusion	.038(**)
	Social Interaction Inclusion	Social Interaction Inclusion	.038(**)
	Risk Factors	Age 25 - 34	.050(**)
	Spatial Variables	Middle quintile of urbanisation	-.061(**)
	Production Inclusion	FT student, school, government training	-.070(**)
	Spatial Variables	Predominantly semi-detached neighbourhood	.071(**)
	Production Inclusion	Unemployed	-.074(**)
	Spatial Variables	Second least urban quintile	.075(**)
	Spatial Variables	Semi-detached property	.087(**)
	Consumption Inclusion	Net equivalised annual income 11,001-22,000	-.088(**)
WEAK	Risk Factors	Age 65 - 74	-.097(**)
	Production Inclusion	Family care	-.101(**)
	Spatial Variables	Second most urban quintile	-.101(**)
	Consumption Inclusion	Net equivalised annual income 77,001- 88,000	.105(**)
	Consumption Inclusion	Net equivalised annual income 88,001- 99,000	.105(**)
	Risk Factors	Age 17 - 24	-.106(**)
	Production Inclusion	LT sick, disabled	-.111(**)
	Spatial Variables	Terraced property	-.121(**)
	Consumption Inclusion	Net equivalised annual income over 99,001	.144(**)
	Risk Factors	Age 55 - 64	.148(**)
	Spatial Variables	Predominantly terraced neighbourhood	-.158(**)
	Risk Factors	Age 35 - 44	.164(**)
	Risk Factors	Age 45 - 54	.167(**)
	Consumption Inclusion	Net equivalised annual income 66,001- 77,000	.170(**)
	Consumption Inclusion	Net equivalised annual income 55,001-66,000	.173(**)
	Consumption Inclusion	Net equivalised annual income 22,001-33,000	.176(**)
	Spatial Variables	Most urban quintile	-.192(**)
	Production Inclusion	Self-employed	.201(**)
	Consumption Inclusion	Net equivalised annual income 33,001-44,000	.207(**)
	Consumption Inclusion	Net equivalised annual income 44,001-55,000	.224(**)
	Spatial Variables	Predominantly flatted neighbourhood	-.227(**)
	Risk Factors	No. of children in household	.242(**)
	Spatial Variables	RC: least urban quintile	.252(**)
	Spatial Variables	Predominantly detached neighbourhood	.268(**)
MODERATE	Spatial Variables	Detached property	.302(**)
	Production Inclusion	RC: employed	.347(**)
	Risk Factors	Age over 75	-.392(**)
	Production Inclusion	Retired - state pension age and over	-.399(**)
	Risk Factors	Male	.423(**)
	Risk Factors	Female	-.423(**)
STRONG	Risk Factors	Number of people in household	.523(**)
	Consumption Inclusion	RC: net equivalised annual income 0-11,000	-.525(**)
	Risk Factors	No. of adults in household	.561(**)
	Risk Factors	No. employed in household	.579(**)

* Correlation is significant at the 0.05 level (1-tailed). ** Correlation is significant at the 0.01 level (1-tailed).

5.3 The Bivariate Correlations - Conclusions

Of the variables tested, very few display strong bivariate correlation with levels of car ownership and only a modest number show moderate relationships. Even of those few strong correlations, the highest correlation stays below an absolute value of .6. In contrast, the abundance of variables with weak or very weak but nonetheless statistically significant bivariate relationships to *mcarhh* might be considered as reflecting the complexity of the relationships between car ownership and the social inclusion paradigm. However, the limitations of bivariate analysis mean that there are concerns with this idea as a working hypothesis.

Firstly, although *consumption indicator* variables predominantly appear in the two strongest relationship categories, perhaps the most striking finding is that the *civic inclusion* and *social interaction* indicators have the second- and third-weakest association with *level of car ownership* of all variables tested, whilst the production inclusion variables are dispersed throughout the very weak, weak and moderate relationship categories. Furthermore, the bivariate relationships demonstrated by the disaggregated *production inclusion* indicators deviate from their anticipated 'inclusion/exclusion' classification.

Secondly, the order of dispersal of the *production inclusion* indicators, and the *exclusion risk factor* variables in the strong category further suggests that household income might be the underlying factor in all of these relationships. Similarly, the influence of the most powerful correlate of all the spatial scale variables, *detached property*, might be attributable to its being the property of choice for households with the greatest disposable incomes.

Bivariate correlations are limited, however, in that they make no distinction between explanatory and response variables, and are unable to recognise effects due to the unique impact of the two variables under study rather than any correlations that they might have with a third variable (Moore and McCabe, 2003). Given the considerable scope for confounding effects due to multicollinearity between the spatial variables, exclusion risk factor variables and social inclusion indicators, it was therefore necessary to find a means of analysis which provides an estimate of the unique influence of each variable. The final section of Chapter 5 deals with regression analyses conducted to that end.

5.4 Multiple Regression Analyses

This section begins by presenting an overview of different functional forms which might be considered when undertaking a multivariate analysis of car ownership. At this stage, the modelling strategy adopted is described. Thereafter, the remainder of the section is devoted to a presentation of eight series of models that have been used to understand car ownership within the sample. Although reference is made to each model series, for both empirical and theoretical reasons only results from the preferred model are presented in depth.

5.4.1 Functional Form and the Dependent Variable

The rationale behind the various functional forms is that they reflect as accurately as possible the nature of the relationship between the dependent and determinant variables.

However, there is a range of estimation techniques appropriate to categorical and limited dependent variables. Perhaps the best known means of multivariate analysis, Ordinary Least Squares regression (OLS), which can be used to estimate the response of the dependent variable, y ,

to changes in the value of explanatory variable x . This is done using an equation that draws a line minimising the sum of squared deviations from that line, vertically, to each observation above and below it:

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$$

Where:

Y_i = dependent variable

α = the Y intercept of the regression line (constant; response of \hat{y} when the explanatory variable $x=0$ (Moore & McCabe, 2003))

β = the slope coefficient (rate at which \hat{y} changes along the line as the explanatory variable x changes (Moore & McCabe, 2003))

X = independent variables

ε = error term

The error term comprises the difference between the regression line (the predicted values of y in the regression, i.e. \hat{y}) and the actual observations of y in the data (Pryce, 2004). Despite - or perhaps because of - its popularity, Aldrich and Nelson refer to regression analysis as “one of the most abused statistical techniques in the social sciences” (1984, p.9); the operation of OLS is underpinned by certain assumptions which diagnostic checks must be carried out to verify²⁷. In the case of car ownership the primary assumption of OLS, that the dependent variable is continuous, is violated. Although estimates will tend to indicate the correct sign of the effect of predictor variables, they will not be unbiased and their variance will not be correctly estimated; consequently, there is no means of verifying whether or not the results of estimates are due to chance (Aldrich and Nelson, 1984).

Although the dependent variable, car ownership, might be construed as a count variable - one indicating the number of times which an event (e.g. vehicle purchase) has occurred (Pryce, 2004) - bearing in mind the

²⁷ Even where the assumptions of OLS are upheld, this functional form can produce negative results, nonsensical when estimating ownership rates of durable goods (McCarthy, 2001)

importance of the real-world usefulness of the model, there are difficulties with this form of analysis: a “count” analysis can be considered inappropriate in that the vast majority of households only have access to a very small number of vehicles; datasets which include vehicle access often have an open-ended upper category, such as “3+ vehicles”; furthermore, Long has observed that the Poisson model, central to the analysis of count variables, seldom fits (1997).

Logit and probit are other options where the dependent variable is binary in nature, or in the extended forms of ordered logit/ probit, to express the order inherent in number of vehicles owned (Gujarati, 2003). Logit and probit are differentiated by their assumptions about the distribution of error; logit models assume a logistic distribution and probit a normal distribution (Maddala, 2001). Although logit tends to approach 0 and 1 at a slower rate than probit, giving a fatter tail, the two functions are recognised as producing similar results (Gujarati, 2003). Logistic forms have been preferred in this research, as the more common function (Kennedy, 2003).

In contrast to OLS regression, which functions by selecting parameters to minimise the sum of squared errors in the regression, logistic regression maximises the likelihood of observing sample values (Pampel, 2000). Logistic regression can predict a discrete outcome from any mix of variables (e.g. continuous, discrete, dichotomous) and unlike OLS regression, it makes no assumptions about the distributions of the determinant values (i.e. whether they are normally distributed, linearly related or of equal variance) (O’Brien, 1992; Tabachnick and Fidell, 2001). The functional form of the regression is designed to produce output between 0 and 1; this being the case, the results of logistic regression can be understood in terms of the probability of an event occurring. Again, this distinguishes it from OLS, which can predict negative values. The equation describes an s-shaped curve, which, as outlined above, more accurately

reflects the combined effect of several predictive factors on the likelihood of a particular discrete outcome than a linear form (Kleinbaum, 1994). In comparison with linear functional forms, this will improve the fit of the data to the model, i.e. the degree to which the model represents the data (Field, 2000). Finally, the regression output can be used in an “odds ratio” interpretation, to calculate the proportionate change in the odds of a characteristic occurring given a unit change in the explanatory variable (Menard, 1995). The estimated parameters in logistic regression are most easily interpreted when expressed in this way (Gilbert, 1993).

The ordered logistic regression employed here is an extension of binary regression, suitable where, although there are multiple discrete alternatives in the value of the dependent variable, they have some inherent order (e.g. 0 cars, 1 car, 2 cars...) as opposed to being alternatives with no ordinal ranking, such as modal choice (Greene, 2003). This form of modelling assumes an unobservable latent variable (y_i^*), for example the propensity to own a car, which can be mapped onto an observed variable. The value of the dependent variable will depend upon where the predicted value of the latent variable lies in relation to threshold, or cut-off, points calculated in the regression analysis (Greene, 2003; Long, 1997). This can be expressed as:

$$y_i = m \text{ if } \tau_{m-1} \leq y_i^* < \tau_m \text{ for } m = 0 \text{ to } J \text{ and } \tau_0 = -\infty \text{ and } \tau_J = \infty$$

Where:

y_i = dependent variable

m = particular value of dependent variable (e.g. number of cars)

τ = threshold point(s)

y_i^* = predicted value of latent variable

J = number of discrete categories of dependent variable

From this, for a dependent variable with four discrete categories, category membership can be calculated as:

$$y_i = 0 \text{ where } \tau_0 = -\infty \leq y_i^* < \tau_1$$

- 1 where $\tau_1 \leq y_1^* < \tau_2$
- 2 where $\tau_2 \leq y_1^* < \tau_3$
- 3 where $\tau_3 \leq y_1^* < \tau_4 = \infty$

Long (1997, pp.120-122) offers a series of four formulae for calculating the probability for each case of the dependent variable belonging to a given category (again, a four-category example). Drawing from this, the probability of each outcome for the dependent variable can therefore be specified as:

$$\begin{aligned} \Pr(y_i = 0 \mid x_i) &= F(-\alpha - \beta x_i) \\ \Pr(y_i = 1 \mid x_i) &= F(\tau_1 - \alpha - \beta x_i) - F(-\alpha - \beta x_i) \\ \Pr(y_i = 2 \mid x_i) &= F(\tau_2 - \alpha - \beta x_i) - F(\tau_1 - \alpha - \beta x_i) \\ \Pr(y_i = 3 \mid x_i) &= 1 - F(\tau_3 - \alpha - \beta x_i) \end{aligned}$$

Where:

$\Pr(y_i = 1 \mid x_i)$ = probability that dependent variable = 1, given right hand side of equation

F = Exponent

τ_i = Threshold value

α = Constant

βx_i = Slope coefficient of variable(s) multiplied by any given value of dependent variable

So, for any given case, the regression determines a predicted value of the continuous latent variable, which can be compared to threshold points in order to estimate the value of the observed variable. Ordered logit distinguishes itself from linear functions in not assuming that the distances between points on the scale of the dependent variable are equal, i.e. the size of the “gap” (magnitude of change in determinant variables) between no car and one car can be different from one car and two cars. However after logistic transformation, the distributional assumption of parallel regression means that the distance between category thresholds of the underlying latent variable can be assumed to be equally spread (Long, 1997). By estimating the true scale of the latent continuous variable, the

logistic model produces a probability that the dependent variable will fall into category 1 rather than category 2, which is the same as the probability that it will fall into category 2 rather than category 3, and so on. Thus, when OLS is applied to a discrete rather than a continuous variable, the level of resultant bias in OLS coefficients can be gauged by looking at unevenness in the gaps between threshold points on the comparable ordered logit calculation i.e. if $\exp(B) = 2$ on variable x , then a unit increase in x doubles the odds of car ownership being in a higher category. Similarly, if $\exp(B) = 0.5$, then a unit increase in x halves the odds of car ownership being in a higher category. So $\exp(B) = 0.5$ and $\exp(B) = 2$ are of the same order of magnitude.

Standard diagnostics for logistic regression models comprise testing for multicollinearity, checking studentised residuals²⁸ for outliers that might unduly influence the regression and checking the percentage of correct classification of cases along with goodness of fit statistics (Menard, 1995; Tabachnick and Fidell, 2001). The results of these tests are reported in Appendix 2.

5.4.2 Modelling Strategy

The modelling strategy selected in all cases was *General to Specific*, beginning with the identification and inclusion of all potentially relevant variables and removing variables, one by one, based on the analysis of Wald statistics and significance. This procedure was followed by diagnostic testing as detailed in Appendix 2. This strategy has been preferred over the specific to general method, as specific to general carries the risk of omitted variables which, as has been outlined, are a serious problem in that they caused bias in the model. The objective of including all relevant variables in each general to specific model is that this risk is minimised.

²⁸ Studentised residuals: The residual divided by an estimate of its standard deviation that varies from case to case, depending on the distance of each case's values on the independent variables from the means of the independent variables. (From SPSS help)

Key terms for understanding logistic regression are included for reference in Appendix 1.

5.4.3 Logistic Regressions

In order to understand how social inclusion dimensions and risk factors described in section 1.5 and spatial scale interact with car ownership, the preferred models from eight series of regressions will be presented. Each series employed different means of understanding variance in the dependent variable, level of household car ownership:

1. Income Model: income variables alone (using the 'excluded' consumption inclusion income band as a reference case) are used as regressors.
2. Social Inclusion Indicator Model: social inclusion indicators (including the disaggregated production inclusion variables) are used as regressors.
3. Demographic Risk Factor Model: demographic factors (excluding income) are used as regressors.
4. Spatial Model: three tiers of spatial variables representing centrality and density at different scales (urbanisation, neighbourhood type and accommodation type) are used as regressors.
5. Social Inclusion Indicator/ Demographic Risk Factor Model: social inclusion and demographic variables are used as regressors.
6. Social Inclusion/ Spatial Model: social inclusion and spatial variables are used as regressors.
7. Demographic Risk Factor/ Spatial Model: demographic and spatial variables are used as regressors.

8. Combined Model: social inclusion, demographic and spatial variables are all used to model level of household car ownership.

As discussed earlier, empirical interest in the significance of mobilities in relation to the wider concept of social inclusion/ exclusion has not kept pace with theoretical developments (see Section 3.2.3). Hitherto, analysis of car ownership has been subsumed under dimensions reflecting material wealth, obscuring the car's role as an aid to mobility and as a means of participating in other dimensions of social inclusion. Whilst the quantitative analysis draws on a framework designed by Burchardt *et al.* (2002), their work involved firstly operationalising their concept of social exclusion and thereafter tracing the course certain individuals followed over time, and examining the co-presence of the different dimensions (*ibid.*). Deploying an operationalisation of social inclusion/ exclusion as a means of understanding car ownership as a phenomenon is therefore an original approach and, this being the case, comparator models are not available. Presentation of findings and discussion is therefore focused on the specific hypotheses under study and the wider quantitative research questions.

5.4.4 Eight Model Series: An Overview

Due to both theoretical and empirical considerations, an in-depth commentary on the results will only be given for the Combined Model, the preferred model (see Model Series 8 (MS8), Table 5.10). From the empirical perspective, the Combined Model demonstrates the best fit with the data in the sample. In theoretical terms, this necessarily means that the other models suffer from omitted variables. This is one of the most serious failings that a model can have in that they are a cause of bias; conversely, (although less seriously) the inclusion of irrelevant variables will reduce the efficiency of the model since the standard errors will be larger because irrelevant variables have not been excluded (Pryce, 2004). However, the bivariate correlations in the previous section indicate a considerable

variety of potential influences when considering the relationships between car ownership, urban form and social inclusion. In order to manage the tensions between inefficiency and possible bias, the preferred options from the other model series have been included for reference. Although suffering from omitted variables means that the individual parameter estimates are unreliable the Nagelkerke statistics, analogous to the AR^2 figure (see Appendix 1) in OLS regression, provide an indication of how effectively the preferred model from each series explains the level of variance in the level of household car ownership.

The Spatial model (MS4 in Table 5.9) makes the most limited contribution to understanding car ownership, accounting for only 19.8% of variance in the dependent variable. It is possible that even this poor explanatory power might be attributed to due to a preference for detached properties (Section 3.4.2). Alternatively, recalling the relatively strong bivariate correlation of *number of people in employment* with level of car ownership, it could be indicative of detached properties tending to house a larger number of adult of working age. Although, as noted above, the estimates for individual variables should be treated with caution, all spatial variables registered as significant with the exception of the *predominantly detached neighbourhood* variable. This is dropped from the regression analysis and therefore demonstrates no significant difference from the reference case of *predominantly semi-detached neighbourhoods*. Other signs are as might be expected.

For comparative purpose, MS2 shows the results of a simple regression considering income alone as a predictor of car ownership. As with the Social Inclusion Model (MS3 Table 5.9), the ‘excluded’ category of *net equivalised annual household income < £11,000* acts as the reference category to which all other income bands relate. This model demonstrates a considerable improvement on series 1, accounting for 41.7% of variance in dependent variable.

The Social Inclusion series (MS3) results in further improved model fit, accounting for 48.7% of variance in level of household car ownership. Notably, the signs on the income variables stay the same; all have a positive relationship with the dependent variable relative to the reference case of households excluded on the income dimension. However, with the addition of the production inclusion variables, the magnitudes of the income variables fall into a more orderly pattern, rising as the income level rises²⁹. As suggested by the bivariate correlations, the production inclusion indicator as conceived by Burchardt *et al.* does not function in a coherent manner when applied to analyse car ownership in that two of the categories designated as ‘socially included’ within that framework (HoH *student/government training scheme* or in *family care*) have a statistically significant negative relationship with level of household car ownership. However, most strikingly, in relation to *consumption inclusion* and the disaggregated *production inclusion* variables, neither *civic* nor *social interaction* inclusion has any statistically significant relationship to the dependent variable.

²⁹ An exception is the net equivalised annual income £88-99,000 category. As previously noted (Section 5.2.1, footnote 24), this category is relatively small (n=60) and anomalous results throughout may be a function of sampling variation.

Table 5.9: The Eight Model Series – Summary Data

PART A	Model Series	MS1	MS2	MS3	MS4	MS5	MS6	MS7	MS8
	Predictor Variables	Income	Social Inclusion	Demographic	Spatial	Social Inclusion/ Spatial	Demographic / Spatial	Social Inclusion/ Demographic	Combined Model
	Wald Chisq	3703.938	4426.258	4183.525	1535.275	5285.070	5408.273	5390.979	5883.263
	Nagelkerke R	0.417	0.478	0.458	0.198	0.544	0.553	0.552	0.585
Social Inclusion Indicators									
Consumption Inclusion	Under £11,000	<i>Reference Case</i>							
(All Figures refer	£11,001-£22,000	1.329	1.191			1.040			
to net equivalised	£22,001-£33,000	2.633	2.236			1.929			1.317
annual	£33,001-£44,000	3.127	2.728			2.405			1.670
household	£44,001-£55,000	3.699	3.233			2.867			2.111
income)	£55,001-£66,000	3.960	3.517			2.999			2.012
	£66,001-£77,000	4.483	3.978			3.452			2.419
	£77,001-£88,000	4.069	3.417			2.901			1.828
	£88,001-£99,000	4.657	4.137			3.806			2.685
	Over £99,001	5.515	4.987			4.452			3.278
Production Inclusion	Employed	<i>Reference Case</i>							
	Self-employed		0.923			0.892			0.780
	Unemployed		-0.994			-0.835			
	Family care		-1.648			-1.780			
	Student/ government training scheme		-1.223			-0.807			
	Long term sick/ disabled		-1.167			-1.104			-0.567
	Retired, on or over state pension age		-1.133			-1.480			
Civic Inclusion	Excluded	<i>Reference Case</i>							
	Included								
Social Interaction Inclusion	Excluded	<i>Reference Case</i>							
	Included								

Relationships significant at $p < .001$

PART B	Model Series (continued from PART A)	MS1 (cont.)	MS2 (cont.)	MS3 (cont.)	MS4 (cont.)	MS5 (cont.)	MS6 (cont.)	MS7 (cont.)	MS8 (cont.)
	Predictor Variables	Income	Social Inclusion	Demographic	Spatial	Social Inclusion/ Spatial	Demographic / Spatial	Social Inclusion/ Demographic	Combined Model
Spatial Scale Variables									
Urbanisation Quintiles	Lowest urbanisation	Reference Case							
	Second lowest urbanisation				-0.529	-0.412	-0.631	-0.636	-0.498
	Middle quintile of urbanisation				-0.611	-0.593	-0.766	-0.773	-0.675
	Second highest urbanisation				-0.702	-0.740	-0.816	-0.819	-0.779
	Highest urbanisation				-0.725	-1.187	-1.215	-1.229	-1.282
Neighbourhood Type	Predominantly detached	Reference Case							
	Predominantly semi-detached								
	Predominantly terraced				-0.361	-0.241	-0.304	-0.305	-0.256
	Predominantly flatted				-0.336				
Accommodation Type	Semi-detached	Reference Case							
	Detached				0.590	0.489	0.762	0.766	0.564
	Terraced				-0.368	-0.315	-0.341	-0.345	-0.308
	Flatted				-1.233	-0.812	-0.974	-1.004	-0.821
	Institutional/ business premises				-1.510	-1.037	-0.999	-0.997	-0.900
Risk Factors									
Gender	Male	Reference Case							
(HoH)	Female			-1.267			-1.130	-1.129	-0.855
Age	35-54	Reference Case							
(HoH)	17-24			-1.152			-0.707	-0.755	-0.568
	25-34			-0.275					
	55-64			0.507			0.261		
	65-74			0.295					-0.371
	Over 75			-0.847			-1.205	-1.286	-1.502
Employment	No. in household employed			1.134			1.148	1.157	0.618
Children	No. children in household			0.200			0.077		-0.224

Relationships significant at $p < .001$

MS4 modelled car ownership in relation to the demographic risk factors. Accounting for 45.8% of the variance in household levels of car ownership, it performed only slightly less effectively than MS2, the social inclusion model. The signs and magnitudes of the predictor variables were as might be expected although in multivariate analysis having a female head of household has a greater effect on the dependent variable than number of people employed in the household.

MS5, MS6 and MS7, included for comparative purposes, attempt to understand car ownership using combinations of social inclusion/spatial variables, exclusion risk/spatial variables, and social inclusion/exclusion risk variables respectively³⁰. Again, despite different approaches, the *civic* and *social interaction* indicators are always eliminated as insignificant early in the modelling process. The least stable variable throughout the process is *number of children in the household*, which changes sign between model series 3 and 5 to 7 and 8 and is not statistically significant in model series 6.

MS8 combines social inclusion, spatial and exclusion risk factor variables to account for 58.5% of the variance in level of car ownership. The comparative failure of the other model series confirm that it is relatively parsimonious in that models that do not take account of all three streams of predictor variables have a poorer model fit. The results from this model are reported fully in Section 5.4.5.

³⁰ Also note that when combining social inclusion and exclusion risk factors the production inclusion variable of “retired status” is dropped in favour of the HoH age variables, which provide more subtle predictors.

5.4.5 MS8: The Combined Model

The preferred Combined Model is here discussed in some depth.

Following comments on overall model fit, the significance, direction and magnitude of the coefficient estimates as retained in or omitted from the final model are discussed under the category headings of Social Inclusion Indicators, Demographic Risk Factors and Spatial Scale Variables. As well as the parameter estimates automatically generated by SPSS, additional syntax has been used to generate exponentiated coefficients of statistically significant variables, along with the associated confidence intervals.

Table 5.10: Threshold Estimates for Model Series Eight – Preferred Model

		Estimate	Std. Error	Wald	Df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[mcarhh = 0]	-1.822	0.102	318.910	1	0.000	-2.022	-1.622
	[mcarhh = 1]	1.563	0.103	230.783	1	0.000	1.361	1.765
	[mcarhh = 2]	4.703	0.121	1509.252	1	0.000	4.466	4.940

Table 5.11: Parameter Estimates for Model Series Eight – Preferred Model.

Predictor Variables	Estimate	Std.Error	Wald	df	Sig	LowerBound	Upperbound	Exp (B)	Lower 95 CI	Upper 95 CI
£11,001-£22,000	0.684	0.07	95.57	1	.000	0.547	0.821	1.98	1.73	2.27
£22,001-£33,000	1.317	0.089	219.07	1	.000	1.142	1.491	3.73	3.13	4.44
£33,001-£44,000	1.67	0.106	246.604	1	.000	1.462	1.879	5.31	4.31	6.54
£44,001-£55,000	2.111	0.126	280.951	1	.000	1.864	2.358	8.26	6.45	10.57
£55,001-£66,000	2.012	0.155	169.463	1	.000	1.709	2.315	7.48	5.53	10.13
£66,001-£77,000	2.419	0.176	188.284	1	.000	2.073	2.765	11.23	7.95	15.87
£77,001-£88,000	1.828	0.23	63.256	1	.000	1.377	2.278	6.22	3.96	9.76
£88,001-£99,000	2.685	0.283	90.323	1	.000	2.131	3.239	14.66	8.42	25.5
Over £99,001	3.278	0.244	180.467	1	.000	2.799	3.756	26.51	16.44	42.77
Long term sick/ disabled	-0.567	0.129	19.396	1	.000	-0.82	-0.315	0.57	0.44	0.73
Self-employed	0.78	0.085	83.626	1	.000	0.613	0.947	2.18	1.85	2.58
Second lowest urbanisation	-0.498	0.073	46.516	1	.000	-0.642	-0.355	0.61	0.53	0.7
Middle quintile of urbanisation	-0.675	0.08	70.663	1	.000	-0.832	-0.518	0.51	0.44	0.6
Second highest urbanisation	-0.779	0.079	97.849	1	.000	-0.934	-0.625	0.46	0.39	0.54
Highest urbanisation	-1.282	0.09	202.17	1	.000	-1.459	-1.106	0.28	0.23	0.33
Predominantly terraced	-0.256	0.067	14.446	1	.000	-0.388	-0.124	0.77	0.68	0.88
Detached	0.564	0.069	67.39	1	.000	0.429	0.699	1.76	1.54	2.01
Terraced	-0.308	0.074	17.568	1	.000	-0.452	-0.164	0.73	0.64	0.85
Flatted	-0.821	0.084	95.559	1	.000	-0.985	-0.656	0.44	0.37	0.52
Institutional/ business premises	-0.9	0.17	28.109	1	.000	-1.233	-0.567	0.41	0.29	0.57
Female	-0.855	0.058	220.154	1	.000	-0.968	-0.742	0.43	0.38	0.48
17-24	-0.568	0.134	18.067	1	.000	-0.829	-0.306	0.57	0.44	0.74
65-74	-0.371	0.084	19.684	1	.000	-0.534	-0.207	0.69	0.59	0.81
Over 75	-1.502	0.089	285.381	1	.000	-1.676	-1.327	0.22	0.19	0.27
No. in household employed	0.618	0.042	221.699	1	.000	0.537	0.699	1.86	1.71	2.01
No. children in household	-0.224	0.031	51.607	1	.000	-0.286	-0.163	0.8	0.75	0.85

The Preferred Combined Model: Model Fit

From the summary statistics at the top of Table 5.9, it can be seen that, due to missing values, MS8 model incorporates 7701 cases from the total weighted sample of 7734 cases. It also shows the -2 log likelihood figures for the baseline model (where the maximum likelihood estimation is conducted using the intercept only) and the full model including the independent variables. The difference between the two figures gives a high model chi-squared figure (significant at $p < .0001$). This can be considered analogous to the F test in OLS and indicates that collectively the coefficients of the independent variables can, with a very high degree of confidence, be considered different from zero and significantly improve the predictive power of the model. Similarly, the Wald statistics, along with their associated significance tests, indicate that individually all of the variables in the analysis can also with a very high degree of confidence be demonstrated to be different from zero; the independent variables and the threshold cut points are all significant at $p < .001$. The predictive efficacy of the model is confirmed by the Nagelkerke R^2 statistic of .585, indicating that the Combined Model explains 58.5% of the variance in the dependent variable in this sample³¹. As a final observation on model fit, the intervals between the threshold cut points should be noted: the 0-1 car interval differs from the 1-2 cars interval by 7.8%. As O'Brien has stated, the most serious implication of recasting a categorical measurement as continuous is the "the researchers may impose a structure on the data which does not actually exist on the ground" (1992, p44), undermining the value of the analysis. The uneven distance between threshold points confirms the

³¹ Adding a lagged variable to the model, in order to incorporate the idea of state-dependence in car ownership, increased the Nagelkerke R^2 statistic to .843. However, given that this is a cross-sectional analysis and the objective is understanding car ownership on the basis of *ceteris paribus*, the addition of the lagged variable is not appropriate to the current analysis.

validity employing a functional form orientated towards categorical variables.

The Social Inclusion Indicators

Consumption Inclusion

As with the bivariate correlations, the dominance of the Consumption inclusion indicators in this model is striking and controlling for the effect of potentially correlated predictor variables has done nothing to diminish that. Table 5.12 displays the exp(B) figures for the predictor variables in order of absolute magnitude and it can be seen that eight of the nine most powerful effects are accounted for by the *consumption inclusion* indicators. Considering Table 5.12 again, even the most modest *consumption inclusion* effect, having an *income £ 11,001-£22,000*, nearly doubles the odds of car ownership being in a higher category. The odds are 1.98 times greater in comparison with the 'excluded' category of *income below £11,000* which was used as the reference case, confirming the hypothesis that consumption inclusion is positively related to car ownership (sig. <.001).

Table 5.12: Preferred Model Predictor Variables in Order of Absolute Magnitude

Predictor Variables	Estimate	Exp(B)	Lower 95 CI	Upper 95 CI	Magnitude
No. of children in household	-0.224	0.80	0.75	0.85	-125%
Predominantly terraced neighbourhood	-0.256	0.77	0.68	0.88	-130%
Terraced	-0.308	0.73	0.64	0.85	-137%
Age 65-74 years	-0.371	0.69	0.59	0.81	-111%
Second lowest urbanisation	-0.498	0.61	0.53	0.7	-164%
Detached	0.564	1.76	1.54	2.01	176%
Long term sick/ disabled	-0.567	0.57	0.44	0.73	-175%
Age 17-24 years	-0.568	0.57	0.44	0.74	-175%
No. in household employed	0.618	1.86	1.71	2.01	186%
Middle quintile of urbanisation	-0.675	0.51	0.44	0.6	-196%
Income £11,001-£22,000	0.684	1.98	1.73	2.27	198%
Second highest urbanisation	-0.779	0.46	0.39	0.54	-217%
Self-employed	0.78	2.18	1.85	2.58	218%
Female	-0.855	0.43	0.38	0.48	-232%
Flats	-0.821	0.44	0.37	0.52	-272%
Highest urbanisation	-1.282	0.28	0.23	0.33	-357%
Income £22,001-£33,000	1.317	3.73	3.13	4.44	373%
Institutional/ business premises	-0.9	0.41	0.29	0.57	-410%
Age over 75 years	-1.502	0.22	0.19	0.27	-454%
Income £33,001-£44,000	1.67	5.31	4.31	6.54	531%
Income £77,001-£88,000	1.828	6.22	3.96	9.76	622%
Income £44,001-£55,000	2.111	8.26	6.45	10.57	826%
Income £55,001-£66,000	2.012	7.48	5.53	10.13	748%
Income £66,001-£77,000	2.419	11.23	7.95	15.87	1123%
Income £88,001-£99,000	2.685	14.66	8.42	25.5	1466%
Income over £99,001	3.278	26.51	16.44	42.77	2671%

Production Inclusion

In contrast to the *consumption inclusion* indicator, bivariate correlations did not confirm a divide between ‘included’ and ‘excluded’ variables as designated by the Burchardt *et al.* exemplar, therefore the *employed head of household* variable was used as a reference case.

Only two of the original *production* inclusion indicators remained in the preferred model for series 8; the rest were excluded on the grounds of low statistical significance. Although the *retired on or after state pension age* variable demonstrated a highly significant negative relationship with the dependent variable in MS2, the decision to retain the *exclusion risk factor* age variables in favour of the two retired status *production inclusion* variables in MS 7 and MS8. The *production inclusion* retirement variables were excluded from these later analyses on the grounds of their multicollinearity with the *head of household age* variables and based on bivariate correlation tests (Table 5.8).

The impact of the head of household being self-employed rather than employed increased the odds of the level of car ownership being in a higher category by 2.18 times, whilst a long-term sick or disabled head of household indicates that the odds are 33% lower than for the household of an employed person. In these cases, variables representing ‘inclusion’ and ‘exclusion’ on the *production* dimension relate to car ownership as hypothesised. However, the bivariate correlations presented in Section 5.2 suggest that something more complex than confirming the hypothesis that *production inclusion* is positively related to car ownership is occurring.

That only two of the six disaggregated *production inclusion* variables were retained in the regression suggests that participation in production activities *per se* has a relatively low relevance to levels of car ownership when the other variables in the regression are taken into account.

Civic Inclusion and Social Interaction Inclusion

Although both indicators demonstrated a statistically significant, if very weak, correlation with level of household car ownership, they were dropped from the model series due to low Wald levels and lack of associated statistical significance. Repeating a pattern set in model series' 2, 5 & 7, the *civic inclusion* indicator was excluded from the regression almost immediately that the model refinement process began and the *social interaction* indicator followed soon afterwards. The hypothesis that civic inclusion and social interaction inclusion act as positive predictors of level of household car ownership therefore cannot be confirmed by the analysis of this sample.

The Demographic risk factors

Most of the *demographic risk* variables were retained in the final model. In accord with the bivariate analyses, gender remained one of the most powerful determinants of level of household car ownership; having a female head of household more than halves the odds of car ownership being in a higher level. As can be seen in Table 5.11, the only exclusion risk factor variable with a stronger impact on the dependent variable was *head of household aged over 75*. In comparison with the reference category of *head of household aged 34-54*, having such an elderly head of household reduced the odds of level of household car ownership being in a higher category by 88%.

The second age variable to be retained in the final model was *head of household aged 65-74*, although this had a relatively modest impact, reducing the odds of level of household car ownership being in a higher category by 31% in comparison with the reference case. This decision to favour the age variables rather than the retirement variables is validated by the contrast between the *age 65-74* and *age over 75* categories. Using the *head of household retired on or after state pension age* variable would

have conflated the two categories, favouring an interpretation than retired status (and so potentially lack of participation in production activities) rather than increasing age is the core issue.

Once income is controlled for, the importance of the *number employed in household* variable is not as great as was suggested by the bivariate correlations, where its relationship with level of household car ownership appeared of larger magnitude than that of 'excluded' income status. Nevertheless, for every additional person employed in a household in this sample, the odds of car ownership being in a higher category increase by 86%.

The variable with the weakest relationship to the dependent variable is *number of children in the household*. Notably, from a (weak) positive relationship in the bivariate correlations and a positive relationship in MS3 and MS6, for the preferred models in MS7 and MS8 it has a negative sign. The most likely distinguishing feature of MS7 and MS8 is that, incorporating the inclusion indicators, they both include income variables. Consequently, in the model which provides the best fit to this sample, for every additional child the odds of car ownership being in a higher category are decreased when controlling for income, illustrating the tension between the desirability of car ownership for households with children and reduced resources for which to purchase and run vehicles.

The Spatial Scale Variables

Previously, MS4, which analysed the spatial variables as predictors of level of household car ownership, showed all spatial variables in each of the three geographic tiers as statistically significant. However, it had very poor explanatory power, and clearly, suffering from omitted variables, the results were unreliable. In the preferred model, MS8, all of the top tier urbanisation variables were retained, but two of the second tier neighbourhood variables and one of the third tier property variables were

dropped from the analysis due to low Wald and associated significance statistics.

The lowest quintile of urbanisation was used as the reference case for the top tier spatial variables. The coefficients in Table 5.11 show that, relative to the reference case, increasing levels of urbanisation are negatively correlated with level of household car ownership³². The magnitude of the impact of each variable on *mcarhh* also increases as the urbanisation quintile increases (Table 5.12). In the case of the second least urbanised quintile, living in the second least urbanised quintile reduces the odds of car ownership by 39% in comparison with the reference case. Living in the middle or second highest quintiles of urbanisation gives reductions in odds of 49% and 54% respectively in relation to the least urbanised quintile. Finally, having a household in the most urbanised quintile has the greatest impact of all the spatial variables, reducing the odds of car ownership by 72% in comparison with the reference case.

The only neighbourhood variable retained in the preferred model for series 8 was *living in a predominantly terraced neighbourhood*, which reduced the odds of household car ownership being in a higher category by 23% in relation to the reference case of *living in a predominantly semi-detached neighbourhood*. It might not be particularly surprising that the model does not differentiate *living in a predominantly detached neighbourhood* from the reference case. Although within the context of the other variables in the analysis, this is the second lowest magnitude, the fact that the *predominantly flatted neighbourhood* variable was dropped from the analysis whilst the *predominantly terraced* variable was retained was unexpected. However, the combined impacts of the *predominantly terraced neighbourhood* and *terraced property* variables lies, as might be anticipated, between that of the *flatted* and *detached property* variables.

³² Note: the confidence intervals in Table 5.11 show some overlapping between variables urb2 and urb3, and between urb3 and urb4.

As a property type, terraced housing also has a relatively weak effect in the model, reducing the odds of household car ownership being in a higher category to 73% of what the odds would be in the reference case of a *semi-detached property*. Living in a *detached property* is a more powerful determinant of car ownership levels, increasing the odds of car ownership being in a higher category by 1.76 times in comparison with the reference case. However, of the third tier spatial variables, it is flatted accommodation which shows the greatest impact on the dependent variable, reducing the odds of car ownership being in a higher category to 56% of what they would be otherwise³³.

5.5 Discussion

This section will initially summarize findings concerning the three hypotheses specifically under study before considering them within the context of the wider quantitative research questions.

5.5.1 Quantitative Research Hypotheses

Hypothesis A: *All dimensions of social inclusion tested will be (positively) correlated with level of household car ownership*

- Consumption inclusion: hypothesis verified. Although the income band just above the ‘excluded’ category showed a very weak (r_s -.088) negative correlation with level of household car ownership and the magnitude of the effect is extremely small, the different distribution of

³³ Osbourne (2006) points out that a significant problem in the interpretation of odds ratios is that they are asymmetrical. Although a value of 1.0 means that the independent variable has no relationship to the dependent (i.e. there is no difference in odds) ratios lower than 1, indicating a decrease in odds are bounded by 0 whilst ratios greater than 1 are unbounded. The result of this imbalance is a perceptual challenge in that measurements below 1 which are, in mathematical terms, of identical magnitude to those greater than 1 have a different psychological impact despite being mathematically identical e.g. being .29 times less likely to be in a category is mathematically equivalent to being 3.5 times more likely to be in it.

level of car ownership between the lowest two income bands suggests *net equivalised annual household income <£11,000* did work effectively as an exclusion threshold for this sample.

- Production inclusion: hypothesis rejected. Whilst all of the disaggregated variables tested did have a correlation with level of household car ownership, this did not occur in the way anticipated by the original concept of production inclusion. In order to better understand the relationships between production activity and car ownership the subcomponents of the original indicator were individually included as dependent variables using 'employed HoH' as the reference case. All had significant bivariate correlations with the dependent variable to $p < .001$, with the exception of *retired below state pension age* ($p < .05$).
- Civic inclusion: hypothesis accepted. The correlation with the dependent variable was highly significant at $p < .001$ but only demonstrated a very weak positive relationship
- Social interaction inclusion: hypothesis accepted. As with civic inclusion, the correlation was highly significant at $p < .001$ and demonstrated a very weak positive relationship ($r_s -.111$) to the dependent variable.

Hypothesis B: *All dimensions of social inclusion tested will act as (positive) predictors of car ownership in multivariate analysis*

The social inclusion indicators were tested in relation to level of household car ownership in MS2, 5, 7, and 8 (see Table 5.9).

The consumption inclusion variables: hypothesis verified. These variables were consistently highly significant ($p < .001$) in all models series where they were tested as predictors of car ownership, with increasing

equivalised net annual household income generally positively associated with increasing probability of higher levels of household car ownership.

The disaggregated production inclusion variables: hypothesis rejected. All of the variables demonstrated significant relationships for MS2 (social inclusion model) and MS5 (inclusion spatial/ spatial model). With the addition of the risk factor variables in MS7, only two of the production inclusion variables were retained and in the preferred MS8, only long term sickness and disability, along with self-employed status were significant predictors of level of car ownership.

Civic inclusion and social interaction inclusion indicators: hypothesis rejected. When controlling for consumption and production inclusion variables, neither of these indicators demonstrated a significant relationship with the dependent variable in MS2 (social inclusion model). The addition of spatial and risk factor variables in later models did nothing to alter their position in relation to the dependent variable and they remained insignificant throughout.

Hypothesis C: In multivariate analysis, larger urban settlements and greater urban density will have a (negative) statistically significant relationship on level of household car ownership whilst controlling for social inclusion indicators

Spatial variables were tested in three tiers: the top tier deal with urbanisation quintile; the middle tier reflected the dominant domestic built form in the neighbourhood; the lower tier of spatial variables related to built form at the level of household accommodation.

The top tier spatial variables (reference case of *least urbanised quintile*), all significant predictors of level of car ownership, increasingly reduce the probability of car ownership being in a higher category as level of urbanisation becomes greater.

Middle tier spatial variables: (reference case of *predominantly semi-detached neighbourhood*) In the preferred MS8, only *predominantly terraced neighbourhood* is a significant predictor of level of car ownership, modestly reducing the probability of car ownership being in a higher category. This variable was retained alongside the equivalent lower tier spatial variable, terraced accommodation, which also had a modest negative correlation with the dependent variable.

Lower tier spatial variables (reference case of *semi-detached accommodation*): All lower tier spatial variables are significant predictors of level of car ownership. Living in a detached property increases the probability of car ownership being in a higher category whilst *terraced* and *flatted* properties are associated with a reduction in probability. Relative to the consumption inclusion bands, the magnitude of the *terraced* effect is smaller than that of all the income categories and the *detached accommodation* effect is stronger but also falls below that of the £11,001-£22,000 grouping whilst the *flatted accommodation* effect falls between that grouping and the £22,001-£33,000 band.

5.5.2 General Quantitative Research Questions

1. What are the relative impacts of the social inclusion indicators in modelling car ownership?

As discussed in section 5.3.4, understanding car ownership in terms of social inclusion alone provides a relatively weak model, explaining only 48.7% of the variance in the dependent variable (see MS2). Nevertheless, that is a significant improvement on the income-only model, explaining 41.7% of variance. For the remainder of this section, findings will be discussed primarily with reference to the preferred model, MS8, full details of which can be found in Table 5.10.

Civic and Social Interaction Inclusion

The very weak bivariate correlations of civic and social inclusion indicators to level of car ownership could be considered the most striking finding of these analyses. As noted in Section 5.2.1, both civic and social interaction indicators showed similar frequency distributions of car ownership for both ‘included’ and ‘excluded’ households, suggesting that car ownership is not likely to play a major part in either dimension of inclusion as formulated here. Furthermore, the point was made that, although the frequency distribution patterns from the *social interaction* and *civic inclusion* indicators did not strongly resemble any of the frequency distribution patterns from the *consumption inclusion* cross-tabulations, they did follow strikingly different patterns from those of the small proportion of very high income distributions, most notably, the ‘excluded’ *consumption inclusion* category. It might be inferred that the lack of difference between included and excluded suggests either that mobility is not important for these dimensions or that inclusion is being satisfied in some other (virtual) way for those who are not physically mobile, except possibly for those who are excluded on the consumption dimension.

The finding from bivariate correlations was further reinforced in the multivariate analyses where, even in MS2, which dealt only with the relationship of the social inclusion indicators to the dependent variable, neither indicator is a statistically significant predictor of car ownership once the *consumption* and *production inclusion* variables have been controlled for. As a caveat, these results must be considered within the context of this sample and using these particular indicators; nevertheless, the lack of significant relationship tends to reinforce the perspective that lack of household car ownership is not hampering mobility, at least for the purposes of social and civic participation.

Consumption Inclusion

Cross-tabulations showing different patterns of level of car ownership between ‘excluded’ and ‘included’ consumption inclusion bands, and differences in bivariate correlations between bands justify the ‘excluded’ divide with regard to *consumption inclusion* and car ownership; the dominant status of income as a predictor of level of household car ownership was further reinforced by multivariate analysis.

Production Inclusion

Bivariate and multivariate analyses using this indicator expose the problems of designating some activities as ‘included’ and some not: production inclusion in the sense of being engaged in socially or economically useful activity cannot be coherently used in the way originally conceived as a means of understanding car ownership. In respect of the *production inclusion*, controlling for income through the *consumption inclusion* indicators the disaggregated components of the indicator *as they relate to level of car ownership* are summarized in Table 5.13.

Table 5.13: Production Inclusion Variables with Respect to Car Ownership

Inclusion status	Included		Excluded
	Significant statistical difference from the reference case (employed HoH)	No significant statistical difference from the reference case (employed HoH)	
Indicator variable	HoH Self-employed	HoH Family care HoH Unemployed HoH Retired	HoH Long term sick/ disabled

The *a priori* assumption here, which is supported by positive correlation to the car ownership of the *number of persons employed in household* variable during both bivariate and multivariate analysis, is that HoH

employed status is indicative of inclusion with regard to *production* and level of household car ownership. Such being the case, in multivariate analysis (effectively, controlling for household income), most components of the original *production inclusion* indicator have no statistically significant difference from the reference case and are therefore also ‘included’ in terms of how the disaggregated *production* variables relate to level of household car ownership. The only *production inclusion* variable to retain ‘excluded’ function with regard to car ownership is HoH *long-term sick/ disabled*.

Nevertheless, in MS8, the disaggregated indicator does provide important information about the relative importance of working status, income, demographic and spatial factors. One aspect of these findings speaks to the desirability of car ownership regardless of income: the significance of the long term sickness and disability against the insignificance of the unemployment variable recalls Dargay’s findings on the asymmetry of the income effect on car ownership (2001); this suggests that levels of car ownership appear to be maintained over an employment/unemployment transition.³⁴ Only sustained illness (which may have concomitant financial implications) or disability significantly impacts upon the dependent variable. The second of the production inclusion variables retained in the final model is more suggestive of need: in relation to an *employed* HoH, the *self-employed* demonstrate a significantly increased probability of higher levels of car ownership, suggesting that the greater mobility offered by private motorised transport is necessary to support self-employed status. The variable indicating that the HoH is *self-employed* is distinguished in that, even in relation to *employed* status, it increases the probability that the level of household car ownership will be in a higher category, indicating extra pressure to have access to private car transport to maintain that status, suggesting that mobility requirements involving activities such as

³⁴ Longitudinal quantitative and qualitative analysis could be used to give greater understanding of the mechanics of these transitions.

visiting customers, delivering goods, collecting supplies and so on cannot be adequately fulfilled by relying on public transport.

Conversely, the fact that, controlling for income, having a *head of household in family care* bears no statistically significant relationship to level of car ownership might be considered suggestive of a gap between access to a household car and the mobility needs for those households in the lower income bands.

Spatial Scale Variables

2. How do spatial scale variables and exclusion risk factors advance our understanding of the relationships between social inclusion and household car ownership?

MS8, which combined social inclusion indicators, exclusion risk factors and spatial variables, most successfully models household car ownership, accounting for 58.8% of the variance in the dependent variable. The second most successful model, modelling car ownership using demographic and spatial variables (see MS6, Table 5.9), explained 54.4% of variance in the dependent variable. These facts, combined with the high percentage of variance attributable to income alone (see MS1) and the absence of a significant relationship between the dependent variable and the two indicators which were perhaps most overtly geared towards social participation, suggest that social inclusion, certainly using this framework, does not provide a particularly effective means of understanding car ownership. Were income considered as a demographic statistic rather than under the rubric of consumption inclusion, this quantification of social inclusion as an explanatory framework would be weakened still further.

However, even conceptualising inclusion in a restricted sense, along the dimension of consumption inclusion, the analysis contributes by indicating the relative magnitudes of the demographic and spatial variables that were

retained in the final model, the strongest of these effects is that of the *HoH age 75 years old or over*. The magnitude of this impact on the dependent variable is greater than that of any other, with the exception of income variables indicating equivalised net household income of greater than £44,000 per year.

High levels of urban centrality, represented by the *murb5* variable have the next greatest impact, although two other age effects were retained in the final model, *age 17-24* and *age 65-74* (Exp(B) 0.57 and 0.69 respectively). All of the top tier urbanisation variables had a greater effect on the dependent variable than *age 65-74*, whilst the middle and upper urbanisation quintiles proved more important than *age 17-24* in terms of the magnitude of their effects. Of the other age variables used in the analysis, having a *HoH age 17-24* accounted for a greater reduction in the probability of car ownership than being placed in the *age 65-74* category. This might be expected in that the peak earning years coincide with peak car consumption (Cervero, 1998). However, the analysis here is of particular interest in that it confirms age rather than retired status as the more important determinant.

Next to having a *HoH 75 years old or over*, the demographic variable with the next largest effect proved to be *HoH female gender* (Exp(B) 0.43). Despite the closing gender gap with regard to levels of car ownership, this variable had a greater magnitude than all of the spatial variables with the exception of the quintile of highest urbanisation. The magnitude of the impact of the urbanisation spatial variables is in some instances greater than that of the (lower value) consumption indicators (see Table 5.13).

Although militating against the hypothesis that civic and social inclusion would act as predictors of level of household car ownership by facilitating physical participation, the lack of a statistically significant relationship could also be interpreted as favourable to the compact city hypothesis in

that, for this sample, it is possible to be civically and socially included without household access to a car. Lack of mobility rather than car ownership *per se* is the root concern (or lack of money rather than ‘exclusion’).

Perhaps the primary finding with regard to the relative importance of the spatial scale variables was that the effect of density at micro level was confirmed whilst controlling for both income and urban centrality³⁵. The impact of living in flats was of very similar magnitude to having a female HoH (Exp(B) 0.44). This outweighed the magnitude of all the centrality effects with the exception of living in the most urbanised quintile. Furthermore, in multivariate analysis, being in a terraced property and living in a predominantly terraced neighbourhood both reduced the probability of car ownership. Finally, living in a detached property had the effect of significantly increasing the probability of car ownership.

5.5.3 Challenges and Limitations of the Quantitative Research

Learning new quantitative techniques was one of the largest practical challenges of the research. The use of secondary data also limits the applicability of the data to the specific purposes of the research; however, the qualitative compliment will be a balancing factor here. A further limitation of the dataset is that, as a household survey, it by definition excludes the homeless and those in institutions - even though this research focuses specifically on *inclusion*, any quantitative results must be viewed with that caveat. Furthermore, given the overlap between socio-economic and housing circumstances and the resulting broad range of explanatory variables, different models were compared and rigorously tested with this limitation in mind.

³⁵ The category of *minstbus* – living in institutional or business premises – has been kept separate to avoid conflation of effect with more conventional residential accommodation.

A necessary limitation of working with a dataset not designed for the analysis of transport data is that there was no information available on car use, which is another important aspect of this research. Equally, the data does not provide information on access to transport or the efficiency or cost of local transport, or the juxtaposition of the respondent's home and place of work or the transport routes and options open to the individual with respect to those routes. The issue of attitudinal influences on modal choice also remains unresolved as the data employed in the analysis provides no evidence on subjective attraction to either car ownership. However, some or all of these topics may be addressed by the second phase of the research.

High levels of missing variables fundamental to the analysis (income and car ownership data) reduced the size of the available dataset, potentially introducing sample selection bias. Additionally, the BHPS by definition deals with households, excluding some of the most disenfranchised people in the population. These factors may account for the 41.5% of unexplained variance in the preferred model.

Finally, the lack of statistically significant correlation between the social interaction and civic inclusion dimensions might imply that the indicators themselves, rather than the concepts, are not relevant to understanding car ownership. The Burchardt *et al* (*ibid*) indicators, on which this operationalisation of social inclusion was based, merit additional commentary at this stage. Both are open to criticism in that they function in relatively narrow terms. Firstly, the *civic inclusion* indicator requires voting specifically in the last general election *or* membership of a political party, trade union, parents association or tenants/ residents association. This conception fails to recognise participation or decision making roles within less formal or conventional frameworks. For example, it has been argued that relatively low voting figures reflect disaffection with traditional structures rather than any lack of political engagement in a

wider sense, citing a shift to activism in issue- rather than party politics as a defining feature of modern social life (Giddens, 2006). An indicator capturing a wider range of activities such as participating in protests, issue-based campaigning or even lobbying MPs might have yielded different results.

Secondly, the *social interaction* indicator is geared towards the conception of interaction as emotional support: having someone who will listen/ comfort/ help in a crisis/ can relax with or really appreciate the respondent. Whilst these are clearly important concerns the definition is again very narrow. As discussed in Section 2.6, social interaction has been conceptualised in terms of the ability to fulfil social roles and, revisiting the Burchardt *et al* definition, to “participate in the key activities of the society in which they live”(2002, p.30). Drawing from the PSE survey, this can involve social interactions such visiting friends and family, having a hobby or a regular evening out, or attending weddings (Pantazis, *et al.*, 2006).

Given the restricted nature of the civic inclusion and social interaction indicators, the question of how to understand inclusion other than in terms of economic drivers remains. This concern in particular necessitates consideration in the qualitative research design.

5.6 Conclusions

The quantitative analyses in this chapter have investigated the impacts of different dimensions of social inclusion on level of household car ownership. They have also compared the relative significance of those dimensions to a range of spatial and demographic factors whilst controlling for income. In both cases the modelling has been carried out across the

general population rather than restricting the analysis to working-age adults.

The findings have addressed the conflation of income level with car ownership level which can occur when the latter is used as proxy for income and identified the extent to which urban centrality and urban density significantly effect household car ownership levels. In particular, the findings corroborate the role of density at a micro-level, suggesting that accommodation type is significant, even controlling for household income. Density of built form at neighbourhood level as well as settlement size and centrality within settlement size has a bearing on levels of car ownership. From this it might be inferred that relatively dense neighbourhoods will have lower levels of car ownership than could be predicted on the basis of income alone: the model predicts that, whilst controlling for income, providing more dense property-types such as flats or terraced accommodation will cause levels of car ownership to fall; the urbanisation variables indicate that the more central the area in which this accommodation is built, the more pronounced the effect.

With the exception of consumption inclusion, the incoherence of one indicator and the relative insignificance of two others highlights problems with the normative aspects of defining inclusion/exclusion for quantitative analysis, as does the comparative strength of models using demographic data to estimate levels of household car ownership.

The findings of this chapter will also inform the qualitative investigation. Features of interest to be carried forward into the qualitative investigation include:

- although *civic* and *social interaction* inclusion indicators (for this sample and using these means of operationalising the dimensions) do have a highly statistically significant positive relationship to car

ownership, that relationship is very weak and they do not act as significant predictors of level of car ownership once *consumption inclusion*, as proxied by *net equivalised annual household income*, is taken in to account.

- In respect of the *production inclusion*, controlling for income through the *consumption inclusion* indicators, the disaggregated components of the indicator *as they relate to level of car ownership* are as follows: not *long-term sick/ disabled* HoH but any other households with HoH under 75 (as the *retired over state pension age* band where there is a statistically significant relationship with level of household car ownership) years old would count as ‘included’ when ‘included’ on the *consumption inclusion* dimension.
- The top tier *urbanisation quintile* variables relate to settlement size but also, in the case of larger urban regions, centrality/ peripherality within that settlement. The lowest tier accommodation type variables acted as the most successful proxy for urban density in that they were also all significantly related to level of household car ownership.
- The Phase Two qualitative analysis of the relationship of social inclusion to car ownership and use will therefore have a broad demographic remit, centring on economically ‘included’ households and employing methods which can help to investigate the differential impacts of urban density and centrality.

6 Researching Urban Car Use – A Qualitative Approach

6.1 Introduction

The chapter begins by reviewing the key methodological concerns that make a qualitative approach appropriate to the overarching research question and objectives. Following this, there is a discussion of how the quantitative component of the research informed the development of both research questions and methods in the qualitative inquiry. Section 6.4 describes the qualitative research process, including application for ethical approval, the development of interview materials, the sampling protocol, and accessing and recruiting participants and venues, before presenting sample characteristics in some detail. Thereafter, the process of analysing the data is described. The final sections deal with the concept of reflexivity and offer reflections on the qualitative research process and the limitations of this component of the research. The section concludes by summarising the suitability of the methods selected to the topics under study and introduces the qualitative findings chapters.

6.2 Qualitative Methods, Urban Travel and the Social Inclusion Paradigm

As outlined in Chapter 1, the core territory of this thesis lies at the confluence of three overlapping policy concerns: urbanisation, specifically with reference to increasing densities; travel choices, particularly car ownership and use; and the concept of social inclusion. The research design was conceived in terms of mixed methods since, although quantitative

methods are a powerful tool for providing generalisable analysis of relationships between variables, qualitative methodologies and their associated data collection methods have a number of features which make them particularly appropriate for better understanding the potential for lowering levels of car ownership and use without inhibiting social inclusion. This initial premise, developed in the opening chapter, has been reinforced by several findings from the review of relevant theoretical and empirical literature in Chapters 2 and 3.

The bivariate and multiple regression analyses undertaken provide statistically significant evidence of relationships between car ownership and different aspects of social inclusion and spatial scales. However, the quantification of relationships between, for example, car ownership and social interaction, or car ownership and dense neighbourhoods, cannot tell us anything about the meaning of the car as an aid to valued social participation or how people *feel* about the impact their choice of residence has had on their travel choices. At a more abstract level, simply the fact of operationalising a complex concept such as social inclusion in quantitative terms necessitates further exploration. It is possible that statistically significant correlations with the inclusion indicators might nonetheless reflect aspects of inclusion that are of minor importance within the wider context of the individual's residential and transport choices; perhaps for particular groups or individuals, participation in a given dimension of inclusion is simply not of interest.

Following from the literature review, the research design framework includes themes relevant to qualitative forms of knowledge in two tiers: social inclusion and travel choices, and urban form and travel choices. The specific qualitative research questions identified were:

1. How do car ownership and use relate to wider issues of social inclusion as evidenced in the statistical analysis?

2. Why might different forms of density, as evidenced in the statistical analysis, influence car ownership, car use and alternative travel choices?

Box 6.1 outlines key aspects of methodology which define qualitative research and the remainder of this section unpacks the connections between the challenges of the above research questions and qualitative methods.

Box 6.1 Key Aspects of Methodology Defining Qualitative Research (Developed from Snape and Spencer, 2003, p.3)

- The overall research perspective and importance of participants' frames of reference
- Flexible research design
- Volume and richness of data
- Distinctive approach to analysis and interpretation
- Kinds of outputs
- Data collection methods

Primarily, the qualitative component serves to support the policy challenge of creating *sustainable* communities in urban areas:

“The complexity of cities, and differences in the urban experience of their inhabitants, lead to a variety of issues that make the search for effective solutions a daunting task” (Jenks *et al.*, 1996a, p.3)

The above statement highlights the necessity of incorporating subjective experiences into the analysis of interactions between social inclusion and car ownership/ use; our experience of the urban environment is mediated both by life experience and the attitudes of other people towards us. Similarly, perceptions of what it means to be included or excluded from society will also vary. Taking account of the range and subtleties of

individual experience is crucial in assessing the potential of decoupling increasing wealth from increasing car use. Distinguishing *why* people make the choices they do is a necessary part of identifying policies which can support lower levels of car ownership and use without damaging social inclusion.

Ritchie divides the functions of all research into the categories of contextual, explanatory, evaluative and generative (2003, p.39). The policy perspectives outlined in the opening chapter are orientated both towards solving social problems and towards normative visions of urban life. From an epistemological perspective, it would be difficult if not impossible to undertake a process of understanding context, theorising causation, evaluating potential interventions and generating ideas *without* respecting the experience and meanings offered by the people involved as useful knowledge. The interpretative slant of qualitative methodologies makes them ideal for unravelling perceptions of causation. This is an important aspect of understanding choices about car ownership and use, in that car ownership in particular is associated with prestige and self-esteem. Are there circumstances in which people might choose to eschew these psychosocial benefits? Or are they drawn to a neighbourhood because it helps to support their preferred travel choices? Conversely, has choosing a particular residential environment altered travel behaviour and, beyond that, how people feel about or value particular travel behaviours?

Further questions raised by the empirical evidence base relate to what Mack and Lansley defined as the question of taste (1985). This is manifested in two ways. Firstly, as Levitas has demonstrated, understanding participation within a quantitative framework is problematic:

“Forcing a choice between ‘don’t want’ and ‘can’t afford’ not only excludes alternative constraints, but conflates the three different phenomena of objectives, experiences and expressed

financial constraint.... the response “don’t want” preserves individual dignity above “can’t afford”. (Levitas, 2006, pp.149-150)

Secondly, the issue of taste is raised by contention over the (un)desirability of living in a dense environment which is apparent in both theoretical and empirical literatures. Given the theme of agency and, concomitantly, choice which underpins some critiques of the social inclusion paradigm another fundamental aspect of qualitative methodology crucial to this research is its adaptability:

A key strength of qualitative research is that it can explore unanticipated issues as they emerge. Design therefore is not a discrete stage which is concluded early in the life of the study: it is a continuing process which calls for constant review of decisions and approaches. (Lewis 2003 p.47)

Importantly, Lewis also adds the caveat that this very adaptability makes meticulous planning a necessity (*ibid.*). Putting a premium on people’s own understanding of lived experience necessitates methods which can be modified to follow the direction dictated by the concepts under study; that is, an affinity with inductive rather than deductive modes of reasoning.

Providing a statistically significant analysis of which different dimensions of inclusion relate to level of car ownership and how, whilst controlling for spatial factors, necessarily involves imposing a framework of what qualifies as a dimension and, on that dimension, what qualifies as included or excluded. The second phase of the research design facilitates in-depth exploration of the topic from a phenomenological perspective to complement the theoretical basis underpinning the quantitative research.

“The goal of qualitative research is the development of concepts which help us to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to meanings, experiences, and views of all the participants” (Pope and Mays, 1995, p.43)

Inductively creating a framework using concepts, meanings and explanations drawn from the data allows cross-referencing with the quantitative approach by providing an effective means of exploring the topic's context and frames of reference (Marshall and Rossman, 1999; Ritchie and Lewis, 2003) - in this case, understandings of and attitudes of urban dwellers towards car ownership and use as they might relate to social inclusion. The approach taken for the qualitative dimension is therefore constructivist, seeking to improve understanding of the meaning and importance of travel choice in different urban environments, in order to evolve policy and practice implications for transport, regeneration and social inclusion (Creswell, 2003).

6.3 Developing Methods

At this stage of the research, the strengths and weaknesses of feasible research methods were assessed to match the questions under study. The following subsections chart how questions arising from the quantitative analysis, alongside both the theoretical and empirical literatures, were approached in the research design and informed the development of the methods used in the second phase of the research.

6.3.1 Case Study Considerations

Given the established importance of household income to both car ownership and social inclusion, quantitative analysis was conducted at household level. This statistical analysis confirmed the importance of the built environment as a determinant of car ownership, whilst controlling for household income, at multiple levels. All of the urbanisation variables and all of the property type variables were also highly significant, with the variable acting as a proxy for settlement size (*murb5*) having the greatest magnitude of impact in relation to all of the spatial variables included in the analyses. This made it important that exploring the relationships

between social inclusion and car ownership and use was therefore framed in terms of geographies of interest. The travel choices, attitudes and experiences of people living in relatively dense and relatively dispersed housing could be compared by targeting case study areas; selecting these areas from within a large urban settlement acknowledged the significance of settlement size in relation to car ownership levels and, by selecting areas of varying centrality, allowed insight into any differential effects of density within different contexts.

Case study research designs are strongly associated with qualitative research and there is an abundant literature around the concept of the case study (Bryman, 2004; Stake, 2005). The central debate is over whether the status of *case study* is determined by the object(s) under study or the strategy of inquiry. Robert Stake, one of the main proponents of case study research, places emphasis on the concept of the bounded system: a case study proper is both bounded in some way, geographically or temporally, and is comprised of inter-related parts (1995). He does include auxiliary caveats typical of the qualitative paradigm, such as that case study participants should contribute to the direction as well as the substance of the research process, but this remains one of the most open definitions of the case study (*ibid.*).

The application of a variety of methods to one location/ organisation can be considered a defining criterion for a case study; Yin cites documents, archival records, interviews, direct observation, participant observation and physical artefacts as six types of data which may be collected and cross-referenced to provide intensive knowledge about a case (2003). Although area profiling involved some background and observational work in the target neighbourhoods, as a sub-component of a larger thesis this qualitative work is predominantly concerned with the development and application of one interview method, and so falls short of that standard.

Nevertheless, in one important respect, the research should be considered a multiple-case study: de Vaus considers the presence of contextual information to be the hallmark of case study research, insofar as it helps to illuminate causal processes (2002). Comparison is an important feature of qualitative research design and in this inquiry, contrasting research locales within one urban system have been selected in order to aid theory-building and enhance the solidity of research findings (Lewis, 2003). Within Stake's typology, this gives the inquiry the status of an instrumental multiple-case study, where the variation of key particulars (the density and centrality of the built environment within a wider metropolitan system) was used to facilitate understanding of the relationship of social inclusion to car ownership and use (2000).

6.3.2 Sampling Strategy

Having determined that case study areas of contrasting density and centrality would form an important component of the qualitative research design, the next consideration was how the research population of interest within those areas would be sampled. Bryman divides this activity into the categories of probability and non-probability sampling: the objective of a probability sample is that "each unit in the population has a known chance of being selected"; in contrast, non-probability sampling rejects the random sampling approach in order to make certain members of the population more likely to be selected than others (2004, p.87).

Ritchie *et al.* dismiss non-probability sampling as "largely inappropriate for qualitative research", in that the characteristics of those sampled rather than their statistical representativeness is the important concern (2003, p.78). Non-probability sampling can take several forms (Table 6.1).

Table 6.1 Forms of Non-Probability Sampling
Source: Drawn from Ritchie *et al.*, 2003, pp.78-82

Sampling Strategy	Summary Explanation
Purposive	Members of a sample are selected on the basis of their relationship to key criteria (e.g. location, strongly representing the phenomenon of interest, extreme or atypical cases).
Theoretical	This is a sub-category of purposive sampling which samples incidents, people or units on the basis of theoretical purpose or relevance (mainly associated with grounded theory)
Opportunistic	Adopting a flexible approach during fieldwork to take advantage of unforeseen opportunities, melding the sample around the concerns of the fieldwork as they evolve.
Convenience	The sample is chosen without a clear strategy, according to ease of access.

Purposive and theoretical samplings are the most robust of these methods (Ritchie *et al.*, 2003). Both are strategic activities, based on relevance to research questions, theoretical position and developing a meaningful account or explanation (Bryman, 2004; Mason, 2006). Corbin and Strauss defined theoretical sampling specifically as:

...a method of data collection based on concepts/ themes derived from the data. The purpose of theoretical sampling is to collect data from places, people, and events that will maximise opportunities to develop concepts in terms of their properties and dimensions, uncover variations, and identify relationships between concepts. (2007, p143)

As discussed in section 1.8.1, social inclusion in urban environments was conceived of as the conceptual backdrop against which this research into car ownership and use would take place. However, both theoretical and empirical literatures evidence debate over the extent to which social exclusion is ontologically distinct from other conceptions of deprivation - a question given further force by the normative assumption that social inclusion, understood as participation, is necessarily a universally desirable

thing (see 2.4.4). Furthermore, the quantitative testing of the relative significance of social inclusion indicators in relation to levels of household car ownership in Chapter 4 confirmed only economic consumption (proxied by equivalised annual household income) as a significant predictor. On this basis, a theoretical sampling approach was identified as being the most appropriate to the research questions in hand. This form of sampling could build on the quantitative data collection cumulatively (Corbin and Strauss, 2007), in order to further develop understanding of what social *inclusion* in relation to urban car ownership and use might mean.

6.3.3 The Sampling Protocol

Sampling was conducted on the basis of a protocol designed to reflect the theoretical priorities of the research. The protocol is presented in Box 6.2.

Box 6.2 The Sampling Protocol

Criteria for selection of potential interviewees (in priority order):

1. Residence in target neighbourhood
2. Consumption inclusion status criterion
3. Driver behaviour

Once the above criteria have been satisfied, *where possible* pursue variety in:

- a) Gender
- b) Age
- c) Household structure

The protocol served three functions. Firstly, it had to reflect the theoretical priorities of the qualitative inquiry. Secondly, it was designed to ensure that a rigorous procedure was in place for selecting potential interviewees from the population of interest. Thirdly, the sampling strategy needed to have the flexibility to adapt to different conceptual interests that might arise during the iterative process of data collection and analysis.

1. Residence in target neighbourhood

The first priority of the protocol was to investigate the roles of centrality, the importance of which was demonstrated by the urbanization variables in the quantitative analysis, and density, as reflected in the significance of the accommodation type and, to a lesser extent, neighbourhood type variables. Further details on how appropriate areas were identified for the study are given later in section 6.4.3.

2. Consumption inclusion status

The second priority was to target relatively affluent households. The *consumption inclusion* indicator was proved to be a dominant influence on levels of car ownership. The ‘included’ cases on that dimension are therefore of particular theoretical interest in that their households have the greatest probability of car ownership.

Furthermore, this focus was underpinned by the overall aims of the thesis: to evaluate the extent to which an urban renaissance might reduce levels of car ownership without inhibiting social inclusion, and to assess the potential for de-coupling rising family incomes from increasing levels of car ownership and use. In order to fulfil these aims, it is necessary to understand under what circumstances, if any, people who *could* drive/ own a car might choose *not* to do so. Moreover, what might the consequences of these travel decisions be in relation to social inclusion/ exclusion? As outlined in Section 2.2.1, both of these concerns have implications for urban sustainability. Individuals from more affluent households were thus identified as the population of interest for the qualitative phase of the investigation, because they offer the opportunity to better understand the travel decisions of those whom Schoon described as “people with choices” (2001). This approach also directly addresses a knowledge gap in that, whilst the relationships between transport and social inclusion/ exclusion are well understood for low-income groups (see Section 3.3.1), little is

known about how these dynamics function within the wider urban population.

3. Car ownership and use

Having identified key criteria regarding the geographic and economic status of the target population, the third priority was to advance understanding of car ownership and use within the targeted urban environments.

As the overall aim of the research is to inform policy that supports the de-linking of increasing wealth from increasing levels of car ownership and use, the locus of interest lies with those who *can* drive but choose not to do so. The population of interest therefore fell into two categories based on driver status:

Current drivers - people who own a personal car OR have shared ownership of a car, which they drive regularly.

Potential drivers - people who are capable of driving but do not have their own personal car OR people who have shared ownership of a car but do not drive it regularly.

This typology recognises both ownership and use as important issues. Where someone had shared ownership of a car, whether or not they were classified as a current (regular) driver rather than a potential driver was determined by the question of substitution: when asked “if [name of other household member] did not want a car any more, what would you do?” People who would keep the car for themselves or buy another vehicle were classed as current drivers; those who would use alternative means of transport were classified as potential drivers. Criterion 2 was designed to screen out households where buying a second car would be financially problematic.

The typology recognises someone without a driving licence as a potential driver *providing that there is no impairment that would make learning to drive impossible.*

Subsidiary criteria a-c

In order to encompass a wide range of perspectives, a mix of gender, age and household structures was considered desirable. However, as demonstrated in previous chapters, car ownership and use are not evenly distributed across the population. Similarly, when dealing with a relatively affluent population, there is also an issue with self-selection bias in residence e.g. central areas will typically have fewer older people and very few families with children (Bramely and Morgan, 2003, Bramley *et al.*, 2006). With respect to this concern, the protocol was instituted to allow for comparison between disparate neighbourhoods in that, although the participants selected from each area were demographically disparate, the sample from each neighbourhood was generated by applying the protocol in the same way throughout the research process.

Snowball Sampling

At this stage of the research design, snowball sampling was preferred as a means of generating contacts. This method involves asking each interviewee to refer other people who match the sampling criteria and is most frequently used in recruiting hard-to-reach populations (Ritchie *et al.*, 2003). Although affluent urban-dwellers might not traditionally be considered as hard-to-reach, targeting households by neighbourhood would not have provided an effective means of ensuring that interviewees were in a financially comfortable position. Snowball recruitment effectively allowed a pre-screening of potential interviewees by someone with personal knowledge of their circumstances. The snowball procedure as applied in conjunction with the sampling protocol is shown in Box 6.3.

Box 6.3 Snowballing According to the Sampling Protocol.

1. I'm looking for other people to interview locally [*probe on exact location and property type if uncertain*]
2. I need people who are really very comfortably off just now - in a position to make choices about holidays or where they live and what they drive [*probe to verify*]
3. Do you know if they drive? [*probe on no. of household cars if appropriate*]
 - a. Do you know of any other [*men/women*] in the area that might be good to talk to?
 - b. It would also be good to speak with someone [*in age group*] if possible
 - c. Can you think of any [*single people/ couples/ young families/ families with older or grown up children*]?

THANK YOU

Could I check back with you in a few days in case you've managed to think of anyone else who might be able to help?

6.3.4 Interview Techniques and Operationalising Inclusion

Bryman differentiates between ethnography/ participant observation and qualitative interviewing when classifying the main research methods associated with qualitative research (2004, pp278-268)³⁶. Given the mixed methods research design, ethnographic approaches, which involve becoming embedded in a social environment for a period of time (Bryman, 2004; Snape and Spencer, 2003), were considered inappropriate due to both time constraints and the requirement to understand behaviour in contrasting urban settings.

As outlined at the end of Chapter 5, the independence of civic and social interaction from level of car ownership could be interpreted in a number of

³⁶ Although Bryman also subsumes "the collection and qualitative analysis of texts and documents" (*ibid*) under the category of qualitative interviewing, there is no necessity that the texts be interview data.

different ways. One of these interpretations was that the indicator as operationalised here did not adequately capture the intended dimension. However, as well as potentially being a failing of the models tested here, the challenge of defining and measuring dimensions of inclusion/exclusion has been an abiding problem (see Section 2.3.4). Considering this alongside the fact that car ownership/use is a topic over which people can become deeply impassioned (Sections 2.2.4, 3.3.3 and 6.7.1), the idea of using more structured qualitative methods raised serious concerns that data gathered through direct questioning geared towards prescribed dimensions of inclusion and mobility habits may be contaminated by confirmation bias and social desirability bias (Fielding, 1993). Focus group work was also rejected as a strategy in that their tendency to gravitate towards a group norm (Finch and Lewis, 2003) was likely to exacerbate these problems rather than give insight into individual behaviour and mores.

Plans to address the qualitative research questions were therefore centred on the decision of which interview techniques were most fit for purpose.

‘Qualitative’ research interviewing...assumes too easily that an interview is an unproblematic window on psychological or social realities, and that ‘information’ that the interviewee gives about themselves and their world can be simply extracted and quoted, as the word of an omniscient and disinterested witness might be accepted at face value in a law-court.” (Wengraf, 2001, p.1)

This brief polemic was pivotal in influencing the selection of interview techniques for the second phase of the research. Qualitative interviewing is necessarily problematic in that it deals with multiple subjectivities: at the very least, those of the interviewer and that of the interviewee. From a philosophical perspective, it is associated with ontologies that understand reality as knowable through, or even created by, socially constructed meanings (Snape and Spencer, 2003); an interview therefore has to be an act of collaboration and interpretation. At a more pragmatic level, the challenges of qualitative work can be understood in terms of bias. A lack of

rigour in the construction, delivery or analysis of the interview can lead to confirmation bias, where the researcher ‘finds’ exactly what they anticipated that they would find (Fielding, 1993). From the opposing perspective, social desirability bias occurs when the interviewee conforms to a perceived social norm and delivers what they anticipate to be the ‘correct’ answer (Fielding, *ibid.*). Relevant to both of these concerns, Wengraf’s demonstration of how leading or biased questions can contaminate the interviewee’s response, also noting that tone of voice and body language can also make the interviewee more likely to “‘tailor’ their response to what you seem to be hoping for” (2001, p163).

In any circumstances, these pitfalls merit serious consideration. However, within the context of this research, designing an appropriate qualitative research tool was particularly challenging on two counts. Firstly, it had been anticipated that the operationalisation of social inclusion employed in the quantitative analysis would be mirrored and extended in the qualitative phase of the research. However, counter-intuitively, the civic and social interaction indicators employed in the quantitative phase exhibited no statistically significant relationship to level of household car ownership, whilst the production inclusion indicator failed to act coherently as a predictor of the dependent variable. Recalling the risks of taking evidence which is “simply extracted and quoted” (*op. cit.*), rather than pursue this, or similar, frameworks further it was decided that the qualitative exploration would focus on a more inductive approach, employing interview techniques geared towards data generation rather than data collection (Mason, 2002). Wengraf conceptualises a correlation between the proposed functions of different interview techniques alongside a spectrum of methods, ranging from unstructured to fully structured (see Figure 6.1).

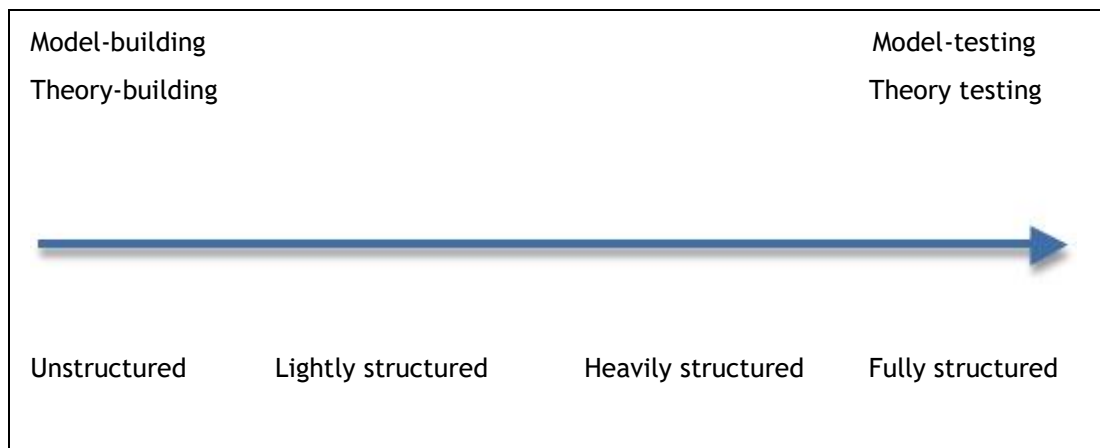


Figure 6.1 Spectrum from Unstructured to Fully Structured Interviewing, and Possible Relationship to Phase in the Development of a Theory

Source: Wengraf, 2001, p.61

Although it is always necessary to ‘translate’ research questions into appropriate interview questions (Wengraf, 2001), this process is especially problematic where the theoretical construct upon which the research draws - in this case, social inclusion - is both a specialist and a contested term. Selecting interview techniques towards the unstructured side of this spectrum could therefore minimise the risk of confirmation bias in that any relationships between social inclusion and travel choices can be more inferred by the analysis rather than framed in the questioning.

In contrast, gathering information about travel behaviour was initially assumed to be amenable to structured approaches, such as providing travel diaries for respondents to fill in, or structured questionnaires. However, although travel choices constitute the topic of the two qualitative research questions, the focal point of interest is to situate those choices in relation to experiences or perceptions of social inclusion/ exclusion and the urban environment.

Whilst focus groups or more structured approaches provide appropriate instruments for understanding how people think and feel about their car ownership and use, again with reference to the opening quotation, they

produce less creditable data with regard to how they behave. As Fielding points out, “expressed attitude is a problematic indicator of what people have done or will do” (1993, p148). Theoretical, empirical and evidence relating to policy literature all indicate that car ownership and use frequently evoke very strong feelings; equally, questioning relating to travel habits also evokes assumptions of an agenda on the part of the questioner (see Section 6.7.2). “Sustaining empathic neutrality”, in order to privilege the perspective of the interviewee can offer:

- Insight into the interviewee’s frames of meaning
- A view of social life in terms of processes
- A holistic perspective within explained contexts (Snape and Spencer, 2003, p4)

However, the objective of attaining this empathic neutrality is seriously undermined if the interviewee begins with the assumption that the research has an orientation either for or against private car use. A less structured interview technique was ultimately considered also more appropriate to researching social inclusion in relation to urban car ownership and use because of the sensitivity of travel choice as a topic.

6.3.5 The Biographical Narrative Approach

Ritchie describes biographical methods as those which use “life stories, narratives and biographies to understand the phenomena under study” (2003, p36). The objective of narrative interview designs is to stimulate the interviewee to tell stories and, in so doing, demonstrate their understandings of how different events are connected both to one another and the context within which they took place (Bryman, 2004; Wengraf, 2001). Wengraf locates the philosophical underpinning of narrative research design as resting on the Freudian concept of gestalt - the structuring

principle of an individual's behaviours (*ibid.*). Congruent with Ritchie's contention that these methods provide the most naturalistic means of generating research data (2003), Wengraf advocates "adopting an interview strategy that minimizes (for as long as possible) the interviewer's concerns (system of values and significance) to allow fullest possible expression of the concerns, the systems of values and significance, the life-world of the interviewee" (2001, p.69)³⁷.

Returning to the basic conception presented in Chapter 1 of social inclusion as participation, biographical narrative offers a solution to the two main challenges of investigating the relationship of social inclusion to car ownership and use that were outlined above. Biographical accounts provide an opportunity to assess connections between travel choices, urban environment and social participation without imposing a framework on the interviewees through questioning. They allow for an oblique approach to the issue of car ownership and use, minimising interviewee preconceptions about the overall aims of the research. Biographical narrative is also particularly appropriate to understanding the role of urban environment in travel choice and inclusion/ exclusion; congruent with the contextual concerns of the case study approach, it also takes a holistic perspective on data collection (Mason, 2002).

The scope narrative accounts offer to explore "the significance of context for the unfolding of events and people's sense of place within them" (Bryman, 2004, p.214) also makes them a suitable medium through which to analyse the interplay between an individual's travel choices, urban environment and any sense of inclusion/ exclusion. The data generated will take the form of stories that interviewees have recounted about their lives

³⁷ This approach stands in contrast to postmodern perspectives that emphasise the construction of reality between the researcher/ participant during the interviewee (Legard *et al.*, 2003). However, reciprocity is – for reasons detailed earlier – inappropriate to the research agenda in this instance. However, the Wengraf approach is self-aware and does not fall into the trap of *assuming* the invisibility and 'objectivity' of the researcher which were partly a stimulus for the iconoclastic postmodernist methodology.

and experiences (Roberts, 2002). As such, it will be as far as possible *uncontaminated* (Wengraf, 2001, *passim*) by either any assumptions the interviewee might make about the agenda of the interviewer (a particularly problematic issue in relation to transport) or any preconceptions the researcher might have in relation to inclusion/ exclusion. The relative place of travel choice, urban form and social inclusion/ exclusion will be a matter for post-hoc inductive analysis. Narratives, by virtue of their storied nature, also offer the potential for longitudinal insights into what factors might stimulate changes in travel behaviour or transport preferences over time and how these changes affect participation across different dimensions (Roberts, 2002).

The interview design adopted for this research was informed by Wengraf's approach to lightly-structured depth interviews (2001, pp.111-151). In contrast to the classic definition of the interview as "a conversation with a purpose" Kahn and Canell (1957, p.149), this is an approach which aims to minimise interviewer intervention by using a design which "focuses on the elicitation and provocation of story-telling" (Wengraf, 2001, p.111). The technique demands active listening and passive/ minimalist responses from the researcher - what Wengraf describes as "non-directional facilitative support" in order that gestalt of the speaker is expressed without distortion (*ibid*, pp.125-7). The focus of the interview is therefore the Single Question Aimed at Inducing Narrative (SQUIN). In its purest form, the SQUIN is a request for a life history (Box 6.4).

"I want you to tell me your life story,
all the events and experiences which were important for you, up to now.
Start whenever you like.
Please take the time you need.
I'll listen first, I won't interrupt,
I'll just take some notes for after you've finished telling me about your experiences."

Box 6.4 Full SQUIN Request for a Biographical Narrative
Source: Wengraf, 2001, p121

The full SQUIN can be adapted to accommodate a particular conceptual focus (such as a specific stage and/or aspect of life). A partial SQUIN can also point towards a particular topic, for example an illness, migration, type of situation or relationship³⁸. After the initial statement of the full or partial SQUIN, the interviewer is restricted to relaunching the narrative by restating the initial question in different forms - Wengraf suggests formulations such as “Is there any more story you can tell me?...” - or reassuring that they are “doing OK” (p125). The narrator will generally spontaneously end their story, announcing words to the effect that “that’s all”; periods of silence should not be assumed to be the ending of the narrative and the interviewer can, after a period of time, check whether there is anything else that occurs to the interviewee (*ibid*).

During the narrative, the researcher can take notes for use in the second subsection of the interview. Wengraf recommends the use of a “SHEIOT” notepad as an aide memoire, for listing Situations, Events, Incidents, Occasion/Occurrences and Time. The details on this sheet can then be used as the foundation for the second sub-section of the interview. There are two important caveats with regard to making notes: themes should be noted in the order mentioned and in the terms used by the interviewee (e.g. if the narrator talks of “Dad” or “going to college”, these terms are exactly reflected back in the second sub-session) (*ibid*). The second subsection of the interview, following the SQUIN, proceeds by drawing on topics raised in the SQUIN. Narrative-inducing questions (see Box 6.5 for examples) are asked about topic raised in the SQUIN, following the same order in which they were originally raised. As before, the intention is to respect the gestalt of the interviewee by following the original sequence of ideas (*ibid*).

³⁸ Wengraf is emphatic that any focus should be formulated “pro-subjectively”, so that the interviewee rather than the interviewer determines the parameters of the event or timeframe for themselves (p123). Requests for clarification are referred back to the interviewee’s own judgement.

Can you give me any example of an occasion when...?

Can you give me any more examples of similar events, incidents at that time/ of that type?

Was there some particular crucial incident of situation or time that you can recall...?

Box 6.5 Narrative-inducing questions

Source Wengraf 2001 p141

Wengraf's structure employs a third subsession, following the analysis of the SQUIN and topic questions, during which the researcher can ask questions arising from the preliminary analysis or relating to the specific requirements of the research.

6.4 The Research Process

6.4.1 Ethical Approval

Qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict. (Stake, 2005, p.495)

The qualitative research project involved the participation of adults capable of giving informed consent who were not in any way particularly vulnerable. Furthermore, although car ownership and use are often emotive issues, they are not, in an ethical sense, sensitive topics. Nonetheless, a number of important concerns had to be considered before formally applying for ethical approval for the project.

Informed Consent and Interview Materials

Ethical approval of all aspects of the study was sought and obtained from the Department of Urban Studies Research Ethics Committee (Appendix 3). All interviewees were provided in advance with an Information Sheet (Appendix 4) including the scope and purpose of the research. In order to facilitate informed consent, all interviewees were provided in advance with an Information Sheet for them to keep and a Consent Form, which was

filled in and given to the researcher before any questioning began. The Information Sheet introduced the broad topic and purpose of the research and detailing what would be involved in participation. Contact details for the researcher, the Departmental Dissertation Co-ordinator and the Department of Urban Studies Director of Teaching and Learning were included on the sheet.

Once the participant had agreed to an interview, the researcher reviewed the Information Sheet with them, checking for questions or making any clarifications required before confirming consent to take part in the interview. The Consent form verified that the Information Sheet had been received and that the participant had the opportunity to ask questions. The consent form also indicated that:

- the participant confirmed that they understood the voluntary nature of contributing to the research and that they could withdraw from the interview at any time
- the interview would be recorded and anonymised quotations may be used in publications
- the participant agreed to take part in the study.

Potential interview participants were again encouraged to ask questions at this stage before signing the Consent form and returning it to the interviewer. Participants were also advised that should they wish to see the results of the research, that the information would be made available.

Anonymity and Confidentiality

The only people having access to the data collected once collected were the researcher and the research supervisors. All data was stored safely and

anonymised immediately upon collection with regard to obligations under the Data Protection Act 1998.

Ritchie observes that the potential which unstructured research designs have for raising unanticipated issues gives ethical considerations a “particular resonance” (2003, p66). Biographical methods in particular, require that extra consideration be given to the protection of research participants (Tierney 2000 cited in from Stake, 2005). Consideration for the anonymity identity unknown outside the research team and confidentiality avoid either direct or indirect attribution of comments to identified participants of research

After discussion with a member of the ethics committee, it was agreed that the neighbourhood as well as the individual would be anonymised. Contact details for participants were stored separately from recordings and both participants and locations were anonymised immediately during transcription. This was facilitated by the researcher carried out all the transcription personally. In the first instance, participants were coded by location, gender and interview number (e.g. CF1 = Central Female 1). During the process of writing up findings, this became cumbersome and participants were ‘named’ according to their neighbourhood location:

Forenames beginning A - Central Neighbourhood

Forenames beginning B - High-density Urban Neighbourhood

Forenames beginning C - Peripheral Neighbourhood

Forenames beginning D - Low-density Urban Neighbourhood

Identifying place names were also removed during transcription and replaced with more generic terms (e.g. “when I was working for *a multinational bank*”).

Data Collection and Storage

Recordings were carried out with a digital recorder. This has the benefit of high quality sound, which was particularly useful on the two occasions the participants wanted to meet in a café area. They are also relatively unobtrusive and so less distracting for the participant. At the earliest opportunity after completing the interview, field notes were taken on other potentially relevant issues e.g. any distraction in the physical environment, changes in attitude during the interview, particularly memorable gestures or change of topic. The recordings were transcribed as close as possible to the time of the interview (usually over the following days) and annotated with field notes where appropriate.

Researcher Safety

All interviews were conducted at a venue and time agreed in advance; the researcher advised a research supervisor and one personal contact of her schedule. Given the biographical nature of the interview, venues where the participants were relaxed and comfortable were favoured. This was most often the participants' own home, although two people elected to be interviewed in cafes.

The Ethical Approval Application

Prior to submitting the research proposal for ethical approval, interview materials including the topic guide for the researcher and an Information Sheet and Interviewee Consent Form for research participants were designed. The ethical approval application provides space for the researcher to add further comments relevant to the proposal. In this section, it was noted that the qualitative component of the research would be conducted under a working title rather than use the formal title of the thesis, *Social Inclusion and the Urban Renaissance - Without the Car*. The rationale behind that decision was two-fold. Firstly, there are issues of

communication: the title of the thesis contains terminology which is contested and which is not common currency outside of policy circles. Secondly, there are concerns with bias in terms of both sample selection and interviewee responses. It was judged that an overt agenda relating to transport might influence participants' willingness to participate in the research process or influence the responses which they give during interview. Wengraft discusses the importance of translating the 'theory questions' of the research into 'informant questions', couched in more natural language and argues that disclosing the central research question and theory questions is a contamination of the interview data (2001 pp. 156-157). Accordingly, following discussions with the research supervisors and the postgraduate convenor, the qualitative research was given a working title of "*Urban Living: how lifestyles and interests vary across different neighbourhoods*". This oblique approach would allow data to be gathered on perceptions of and attitudes towards car ownership and the value of different travel behaviours to participants without the underlying research agenda influencing responses.

Following these considerations, the process of gaining ethical approval was relatively straightforward. As can be seen from the checklist in Section B of Appendix 3, there were no further complicating circumstances and approval was granted by the Department of Urban Studies Ethics Committee rather than being referred to the Law Business and Social Science Faculty Committee.

6.4.2 Piloting

Piloting was conducted by pre-testing the interview structure with colleagues and friends, and consulting with research supervisors. The function of the pilot was both to test the narrative/ semi-structured method and to build an experience base for the interviewer, working with an unfamiliar technique. Taking on board Wengraf's position that "the

more information you give, the more they will inevitably ‘slant’ what they say in the light of their interpretation of ‘who’ they think you are and what they think the effect of your research will be (*ibid*, p189)”, the initial criteria for selecting pilot interviewees were that:

- They were not people who were close to the researcher (they were acquaintances of friends, whom she might have met in passing or heard my name but would have minimal pre-conceptions about the interview)
- They had no awareness or indication that the research was targeted towards transport

After the first four pilot interviews, having gained some experience of the approach, the remainder were with people were totally unknown to the researcher and also had a reputation for being taciturn or difficult, to ensure that early promising results were not simply reaping the good-will of particularly co-operative people.

Six pilot interviews were carried out. The objective of these was to testing the method in terms of whether or not it was effective in generating information about mobility and accessibility and how the interviewees felt they fitted into their lives. Preliminary results were promising with issues relating to mobility and accessibility spontaneously appearing in the narrative section of all interviews.

The major modification that was made as a result of the pilots was that the working title was changed from *Urban Living: how lifestyles and interests vary across different neighbourhoods* to *Neighbourhood and Lifestyle: the role of urban environment in social and economic participation*. Although contents of the Information Sheet for the participants remained the same the initial title, particularly ‘lifestyle’ seemed to confuse participants, and generated questions rather than encouraging them to reflect/ get lost in

their own experiences. Ironically, more rigorous-sounding concepts of 'urban environment' and 'social and economic participation' seemed just anodyne enough to be ignored.

6.4.3 The Case Study Sites

The quantitative analysis had established the geography of interest in terms of urban centrality and density. Glasgow is a major urban centre in the UK. The city provides an appropriate site for the qualitative research for both pragmatic and theoretical reasons. As well as being the home of the University of Glasgow, from where this research is being conducted, Greater Glasgow is the largest urban area under the responsibility of Strathclyde Partnership for Transport, the non-academic sponsor of the research. It has unusually low levels of car ownership, even within Scotland (Stradling, 2004b). This might be attributed to a range of factors from relative poverty, that the fact that the city is mostly well-served by public transport to the relative density of one of the main urban forms in the city.

The typical form in the city is the tenement building. An individual building will generally comprise eight flats over four floors, sharing a common entrance on the ground floor. The buildings are often joined together to form a large, hollowed out square or rectangular formation when viewed aerially. Between blocks there is often communal garden space to the rear of the buildings.

Target areas were identified by selecting neighbourhoods running from the city centre to the metropolitan periphery which were as far as possible comparable in terms other than density and centrality. Four areas of the city varying by centrality/ peripherality were selected. A section between two radial routes taken from the city centre to the metropolitan periphery was identified to allow some comparability of access into the urban core.

Table 6.2 Characteristics of Research Neighbourhoods

Neighbourhood	Description
Central Area (<i>HiCent</i>)	<ul style="list-style-type: none">▪ High density mixed use▪ Tenement accommodation over shops/ bars, modern apartments, warehouse conversions▪ Some with shared courtyard/ garden space▪ Occasional basement garage space
High-density Urban Area (<i>HiUrb</i>)	<ul style="list-style-type: none">▪ High density mixed use▪ Traditional tenement buildings▪ Shared back garden▪ Street parking
Low-density Urban Area (<i>LoUrb</i>)	<ul style="list-style-type: none">▪ High density residential▪ Villas (some upstairs/ downstairs conversions) and semi-detached housing▪ Large gardens▪ Large driveways and often single and double garage space
Low-density Peripheral Area (<i>LoPer</i>)	<ul style="list-style-type: none">▪ Low density mixed use▪ Bungalows, generally with extensions added; some villas/ semi-detached housing▪ Front gardens , sometimes paved to accommodate vehicles and large back gardens▪ Generally single or double garage space

The two urban ring areas selected are side by side in a large area of the city, comprising dense housing towards the east side and large free-standing villas to the west. The low-density peripheral neighbourhood is predominantly made up from bungalows and villas. The bungalows usually have extensions. Front and back gardens with single or double garages are the norm; some front gardens are paved over to accommodate vehicles more easily.

The dominant form of housing in this area is the villa. These are often set in the middle of large gardens as well as in a front-garden/ back-garden layout. Some of the villas have been sub-divided, with one household upstairs and another below, although one participant identified a current trend towards reunifying buildings into one property again. The area has shopping and dining facilities within walking distance but this area is exceptional in that these amenities are set off to the side of the neighbourhood rather than central.

The central, dense urban and peripheral areas are all well served by buses. The low-density urban area has very little bus service, although it is

bounded by three different train stations. It also, in opposition to the other three sites, lacks some of the ‘village’ focus, as most of the area stretches away from the core of the denser area to the east (i.e. contrasting on bus service and mixed-use urban focus despite being more ‘central’ to the wider conurbation). All areas are relatively affluent within the wider context of the city. The area-based aspect of the sampling strategy is founded on an ‘anchor’ datazone for each location. These are comparable in that they are all 2nd quintile areas according to the SIMD. However, this leaves two outstanding issues. A datazone is a relatively small geographic area, only a few streets in the case of more dense housing which raises some concerns about the anonymity of respondents. Secondly, as is well documented in the literature, one of the major disadvantages of any area-base initiatives lies in that not all deprived people live in deprived areas; the converse is also true. This is of concern in that it is core to the research that, from an economic perspective, the respondents have *choice* about how they travel. In response to these issues, respondents were also drawn from datazones adjacent to the anchor area, providing they met the economic and density criteria for the sample.

6.4.4 Applying the Sampling Protocol: Selection and Recruitment

Snowballing

An indicative plan to undertake roughly three interviews each from the two categories current and potential drivers across the four areas was conceived. However, as Lewis points out, “the relationships between study design, theory and data collection are iterative” (2003, p75). For theoretically driven sampling in particular, which is concept drive, it is important that as new features emerge the size of the sample can be increased to investigate further (Corbin and Strauss, 2007; Silverman, 1997). Corbin and Strauss advocate for theoretical sampling that the

sampling process should continue until saturation - the point where “no new data are emerging” (*ibid.*, p143).

The sample was extended in some areas and reduced in others the light of emergent theoretical concerns. Characteristics of the final 23 participants are shown in Table 6.3.

Location	Participant	Age band	Household Structure	No. of Cars	Driver Status
Low-density urban	David	55-64	Single & elderly parent	1	Current
	Diane	65+	Couple & 1 child	2	Current
	Daniel	25-34	Couple & 2 children	2	Current
The Central Area	Alistair	35-44	Single	0	Potential
	Andrew	25-34	Single	0	Potential
	Amy	45-54	Single	0	Potential
	Alison	45-54	Single	1	Current
	Abigail	55-64	Couple	1	Current
	Arthur	25-34	Couple	2	Current
Peripheral Area	Cindy	65+	Couple	1	Potential
	Claudia	65+	Couple	1	Potential
	Carole	65+	Couple	2	Current
	Callum	55-64	Couple	2	Current
	Charlotte	45-54	Couple +2 children	1	Potential
	Colin	35-44	Couple +2 children	2	Current
High-density urban	Barbara	45-54	Single	0	Potential
	Beth	25-34	Single	0	Potential
	Brenda	55-64	Single	1	Current
	Bella	25-34	Living apart together	1	Current
	Brandon	35-44	Couple	1	Potential
	Boris	45-54	Couple +1 child	1	Current
	Bonnie	35-44	Couple +2 children	1	Potential
	Blair	35-44	Couple +2 children	1	Current

Table 6.3 Characteristics of the Qualitative Sample

The snowball and sampling protocol were effective in recruiting participants in all but the low-density urban area (see Chapter 7). In two instances, participants were revealed during the course of the interview to be struggling financially. The session was continued as normal but the data

excluded from the analysis for that reason. Further information on the characteristics of the sample as revealed during interviews and demographic collected from participants (see Appendix 6) is discussed in Chapter 7.

6.5 The SQUIN and the Topic Guide

The format of the interview is in two parts. However, with concentration on the part of the researcher, those two parts should (and, I think, *did*) appear as a seamless whole to the participant. The interview opens with the researcher managing the participant's expectations, explaining that the idea of the interview was just to learn about peoples' lives in different neighbourhoods and that they should talk about whatever felt important to them.

Box 6.6 Introduction to Interview.

This isn't like a market-research interview or anything like that. The idea is just to learn a bit about different peoples lives, so you just get to talk about whatever you feel has been important for *you*.

- Please take the time you need.
- I'll listen first. I won't interrupt.
- I'll just take some notes for after you've finished telling me about the experiences that have been important for you.

(Take a couple of beats and make eye-contact to reassure and check they've absorbed this. If in doubt check, 'does that sound ok?')

After this scene-setting, the SQUIN was presented (Box 6.67).

Box 6.7 The SQUIN

I want you to tell me about what's been happening in your life ever since you first came to the neighbourhood you live in now - big changes and just day to day routine.

Maybe you could start around when you first decided to move to the area, and continue talking through how things have been developing for you up to now.

At this stage, the researcher should relax and hold a silence. Generally, participants were initially uncertain but would begin to talk, and then to relax as they became caught up in their narratives. For a small proportion of the interviews, there would be another question or comment from the participant. In two cases, the participants mentioned that they had lived in the area for most of their lives. In both cases, a positive response was given, as though this was an especially good and interesting thing and left them to open their narratives where they saw fit. The second kind of query was over the meaning of neighbourhood. This came from people who had lived in more than one property in the area. Again, interviewer intervention was kept minimal and the decision put back to the participant.

The Single Question Inducing Narrative (SQUIN) employs a principle of “deliberate vagueness” (Wengraft, p122). The objective is to minimise the influence of the interviewer and require the participant to impose their own system of relevance on the broad topic.

During the course of the interview, whenever a participant mentioned concerns relating to neighbourhood, travel, transport or links between these issues, a number and notes were entered by the relevant topic on the interview schedule (see Appendix 6 for details). The object of this was that later questioning would duplicate the order of topics and language initiated by the participants.

6.6 Analysis

Analysis was conducted following Creswell’s 6-step analytical process (2003, pp.193-195):

1. Organise and prepare data for analysis
2. Read through all the data

3. Begin detailed analysis with a coding process
4. Use the coding process to generate descriptions (detailed rendering) of information about people, places and events in a setting. This coding is used to generate themes which can themselves be interconnected using further codes.
5. Advance how themes and descriptions will be presented in the qualitative narrative
6. Make an interpretation of the meaning of the data

Specifically considering the initial data management process, Ritchie, Spencer and O'Connor are emphatic about the importance of recognising that, necessarily, “‘meaning’ is being *attributed* to the original material” (2003, p.237, emphasis added) at all stages of analysis. With this in mind, care was taken to take notes during and after interviews, transcribe the recorded interviews accurately and attend to both what was said and *how* it was said. Anonymised transcriptions were imported into NVivo and field notes added as document memos. These memos detailed information such as where the interviews took place, rapport or otherwise between the researcher and participant, points of particular engagement/disengagement for the participant, and other details which might either have a bearing on the interview or otherwise inform the analysis.

As soon as a transcription was entered into NVivo and field notes attached, the coding process was begun. This approach prioritised working with the data whilst the interview was still fresh in the mind of the researcher. Additionally, as Bryman notes, beginning the analytical process with each interview as it occurs can sharpen understanding of the data and inform theoretical sampling by directing the researcher's attention to areas that require further investigation (2004, p.408).

It is a commonplace of qualitative research that analysis is an iterative process and that the lines between coding, analysing and interpreting data are blurred (Bryman, 2004; Mason, 2000). In accordance with such a definition, therefore, the first steps of analysis occurred during the preparation of the data for analysis and repeatedly listening to and re-reading the transcriptions *before* any coding was undertaken. Although summarised above in steps 3 - 4, rather than being a single, discrete activity, coding involved revisiting earlier interviews each time a new interview occurred and adapting the coding framework as required when new data became available.

With this caveat in mind, step 3 activity involved coding in different 'layers'. The first of these was at micro-level, flagging words or phrases of interest: anything relating to the key concerns of transport, travel, housing, neighbourhood, or gradations between urban and rural environments. The second layer sought evidence of the participants' emotional and intellectual contexts around those ideas, whether implicit or explicit: references to thoughts, activities or emotions relating to the micro-level items; ideas, opinions, feelings and anecdotes around social, civic, environmental or work-related topics; evidence of relationships which might indicate perceived social inclusion/ exclusion in relation to the key concerns and wider interactions. The third layer involved approaching the data from a more holistic perspective, attending to the structure of the overall narrative, the flow of ideas within that structure and how the speaker made connections between different topics. This tertiary layer was undertaken in respect of the fact that narrative interviewing entails:

“... an approach to the elicitation and analysis of data that is sensitive to the sense of temporal sequence that people, as tellers of stories about their lives or events around them, detect in their lives and surrounding episodes and inject in their accounts. With narrative analysis, the focus of attention shifts from ‘what actually happened?’ to ‘how do people make sense of what happened?’” (Bryman, 2004, p.412)

‘Code-and-retrieve’ approaches have been heavily criticised, particularly in relation to the use of CAQDAS packages, as data is highly fragmented and then considered outside of its original context (Coffey and Atkinson, 1996). The third layer of coding was therefore particularly useful in unpacking the relationships between participants’ *opinions* about different urban forms or travel choices within the context of the stories they told about their actual behaviour. Indeed, the tensions and contradictions apparent between opinion and reported behaviour comprised some of the key findings of the research (see Section 7.7). NVivo was employed successfully as data management software for structural analysis of the narratives, and for coding shorter quotations or individual words.

As noted above, step 4 of the process, which involved collapsing initial coding into hierarchies or broader themes, was undertaken concurrently with step 3 in that previous interview texts were revisited every time new data were collected. The structures developed in this part of the process provided the foundation for step 5, which considered the presentation of the data. One of the ways in which the coded data was grouped and cross-referenced involved nesting references to travel behaviours and urban environments within participant accounts and participant neighbourhoods. Chapter 7, addressing the role of density in travel behaviour, took advantage of these structures by presenting data under the overarching heading of the case study neighbourhood, and then under the pseudonym of individual participants. Commonalities and contrasts between the attitudes and behaviours of the participants were then explored at the end of each section relating to the case study neighbourhoods.

Beyond this more conventional means of structuring the data, the narrative aspect of the accounts provided longitudinal perspectives, as participants reflected on different experiences of residence, sense of identity, transport use, relationships and community over their life histories. These emergent

themes were grouped together in Chapter 8 and analysed in terms of the core theme of place and its implications for social inclusion/ exclusion.

Step 6 - make an interpretation of the meaning of the data - was also, necessarily, an iterative process. In accord with the well-established comparative method of analysis (Strauss and Corbin, 1990, pp.84-93), care was taken to maintain close contact between the raw data and the emerging theoretical framework, testing the coherence of provisional themes across the developing dataset, seeking contradictions and 'negative cases' as well as confirmatory evidence (Ritchie *et al.*, 2003, p.81).

6.7 Reflexivity and Reflections

"Postmodernism: Seeks to deconstruct the concepts of the 'subject' and the 'field'." (Silverman, 2001, p.39)

Bryman defines reflexivity in the wake of postmodernism as "a greater awareness and acknowledgement of the role of the researcher as part and parcel of the construction of knowledge" (2004, p.500). A reflexive approach, including reflections on the values (biases) and personal interests of the researcher, can therefore be considered as contributing to the validity of the research by providing contextual information (Creswell, 2003). In support of this objective, this section goes on discuss how reflexivity has informed the research design and to provide a brief description of myself, along with reflections of my own role in the research process.

6.7.1 Reflexivity and Research Design

Throughout the doctoral process, I aimed to open my work in progress to peer review. As well as presenting workshops within my home Department, I presented six different papers at conferences in the UK and other Western European locations. Two of these were based on the quantitative analysis,

one developed my mixed methods framework, a further two specifically involved qualitative findings and the sixth related the case study work to transport governance.

I remain grateful to everyone who contributed at these events, both within the Department and further afield. However, the first two presentations, discussing the quantitative work, proved unexpectedly influential in shaping the qualitative research design. Very early on, I learned that raising the topic of car ownership and use frequently provoked, not only strong reactions, but assumptions about the agenda of the research. Whilst being introduced at conferences and in less formal discussions, people would either explain to me whether or not they had recently been ‘bad’ or ‘good’ in terms of their travel behaviour or, alternatively, would either berate me for, or sympathise with, my assumed position on the topic. To my bemusement, I found that no amount of prefacing what I said with assertions of neutrality on the joys or threats of car transport succeeded in deflecting this reaction. The quest for a qualitative mode of inquiry that nullified these impacts can therefore be cited as the most tangible evidence of my reflexive practices. Although it involved considerable extra work and no small anxiety about how much time I might lose if the hybrid narrative/ semi-structure approach developed for the qualitative phase failed to generate suitable data, I am more than pleased with the selection of an oblique method, designed to produce data as free as possible from assumptions about my role in the research.

6.7.2 Myself as a Researcher

Lewis notes that matching interview and participant characteristics in terms of socio-demographic criteria can prove helpful in terms of data collection (2003). In this regard, I made quite a comfortable fit with my research participants. Although I have never lived in any of the case study areas, I am very familiar with Glasgow. I was born and brought up in the

city, attended school in the suburbs and have studied at three of the city's universities. I am female and, at the time of the fieldwork, was in my mid-forties. I have been based in and around the city for much of my working life and as a result have access to a wide network of erstwhile colleagues as well as friends and family, which has developed over many years. This was particularly useful for initiating the snowball recruitment strategy.

Reflecting the majority demographic of the city, I am caucasian and of Scots/ Irish/ German descent, with a local accent. My accent also identifies me, like many of the research participants, as being of a middle-class background. Other than these things, which are beyond my control, I am very well travelled and have been accustomed to contact with people from a variety of social, national and cultural backgrounds. Perhaps as a result of this I am used to being described as a confident person and I am comfortable and relaxed about interviewing research participants. At various times, my working life has required me to put people at their ease or otherwise support them and interviewing is an activity that I enjoy.

Nevertheless, Lewis also warns against the risk of “cultural collusion” contaminating the data collection when interviewing people of ostensibly similar background (*ibid.*, p.66). Several factors helped to reduce the danger of unexamined assumptions resting between myself, as interviewer, and the research participant. Firstly, the method selected was designed to, as much as possible, write the interviewer out of the interview, tilting the balance of communication, interpretation and power heavily in favour of the ‘interviewee’, who had charge of the narrative (see Section 6.3.4). Even the semi-structured content followed the language and the order initiated by the research participant. Secondly, some of my earliest academic training was in literary linguistics and critical theory, both of which valorise careful attention to the language of any text (in this case, the speech of the research participants), striving to understand that text within its own framework rather than imposing values. Thirdly, I have

substantial experience interviewing people as potential employees. The primary skill here is also teasing as much information as possible from the interviewee; this is can be achieved most effectively by relaxing them and then avoiding the trap of leading them towards whatever it is that you, as an employer, are hoping to hear.

Despite the confident tone of the previous paragraph, I did find the discipline of trying to prompt stories rather than asking more directed questions very difficult in practice. However, the pilot interviews proved a very useful training ground and drawing on previous training in counselling techniques, where the objective is to help someone find their own voice and solutions, was helpful. Needless to say, I still slipped during interviews, using the more familiar modes of ‘why...?’ or ‘how..?’ instead of the less directed story-eliciting forms advocated by Wengraf (*op.cit.*). However, my skills improved during the course of the fieldwork and, given my own determination to be open about the direction the research might take, more often than not when I did make a directed enquiry or comment, it tended at least to reflect my assumptions about the participant rather than my own framework or experiences. I will close this section of the thesis by expanding a little on this comment.

I do not drive. I have had lessons. I’m pretty sure I can remember *how* to drive were it ever to prove necessary. However, I have not and will not sit a driving test. Basically, I’m bad at it. I don’t have binocular vision, having very little sight in my right eye (adding new resonance to the expression ‘check the blind spot’) and compound these failings with poor hand-eye co-ordination. This being the case, at a personal level, I am all for anything that makes the lot of the pedestrian or public transport user more happy.

However, it would be a considerable stretch of the truth to describe me as holding an anti-car position. I have been a regular user of taxis since around age 14, will cheerfully accept a lift if offered one, and found riding

in 1950s American cars when in Cuba completely thrilling. I think probably my biggest slip in interviewing was asking a participant how she managed to “cope” without a car when her husband was working away from Glasgow. This definitely counts as an intervention, in that it betrays a value framework (i.e. a car is necessary to cope with urban life) rather than just being a prompt to give more information. Although the failing lay in misreading cues about her perspective rather than imposing my own, it’s a reminder of how difficult it is to never slip when working with less-structured interview forms. Still - her response was fascinating (see Section 7.5.8).

6.8 Limitations of the Qualitative Phase

The limitations of the qualitative phase are considered here in terms of the limitations of the researcher and the limitations of the method. The limitations of the researcher have already been touched on in the reflections above. The level of concentration required in attending to the participants’ language and demeanour, combined with annotating the interview schedule, was intense. Despite the care taken in the research design and interview schedule, advance preparation and piloting, it is important to acknowledge that the practice of interviewing is necessarily vulnerable to both researcher error, and circumstances outwith the control of the researcher: the perceptions and attitudes of the interviewees with regard to the research process. The “empathic neutrality” advocated by Snape and Spencer (2003, p.4) can be aimed for as an achievable goal but there are elements of tension in the concept that render it more of an ideal. The extent to which I successfully ‘connected’ with participants in order to elicit information will have been variable and, on occasions, I am certain that I erred on the side of empathy rather than of neutrality in my attempts to stimulate story-telling.

This leads to the particular limitations of biographical interviewing. One of the major reasons for selecting this method is also the source of one of the major limitations of the study: the price of gaining as much insight as possible into the *participant's* frame of reference (see Section 6.3.5) is that power over what will be discussed and how it will be discussed rests with said participant. The method satisfactorily generated data which spoke to the qualitative research questions. However, as will be seen in the following chapters, this data made little connection with social inclusion/exclusion as conceptualised in the first phase of the research. Whilst inclusion in terms of social interaction formed a dominant theme in the analysis, this was not social interaction as conceptualised within the quantitative phase of the analysis. Furthermore, civic inclusion, in terms of political party, trade union, parents' association or residents' association membership or voting, was not a feature within the qualitative transcripts. Although this is itself a finding, broaching the conceptions of inclusion operationalised within the quantitative phase with the qualitative participants might have been illuminating and provided a greater sense of completion to the thesis as a whole. However, introducing additional ideas outwith the gestalt of the participants would have been counter to the rationale of the method and undermined the status of the data. The priority focus was gleaning uncontaminated information about urban form, transport and social inclusion/exclusion *as important to the participants*.

Finally, the research is limited in that it should not be considered generalisable. It has not aimed to represent a wider population but rather to build theory drawing on the perspectives and experiences of particular individuals situated within a particular urban framework (see Section 6.3.1).

6.9 Summary and Conclusions

This chapter has described the development of the methods used in the second phase of the research, following statistical analysis of the impact of urban form on car ownership levels relative to the operationalised concept of social inclusion. The following two chapters present findings in relation to the qualitative research questions. Chapter 7 employs a case study structure, using participants' accounts grouped by neighbourhood to explore the implications of different urban settings for transport and travel. Chapter 8 takes a thematic approach, inductively developing an understanding of what social inclusion or exclusion might mean to the research participants.

7 Driver Behaviour – Contrasts and Connections

7.1 Introduction

The quantitative phase of the research demonstrated that, even whilst controlling for income, settlement size and neighbourhood density play a role in determining levels of car ownership. Complementing this, the qualitative phase of the research centres upon the theme of car use in urban areas. The research instrument used in this phase was designed to support an inductive approach, therefore rather than beginning with detailed qualitative research questions, data generated using the SQUIN was analysed for text potentially illuminating issues relating to social inclusion and urban mobility from the perspective of the participants.

This chapter investigates the relationship between space and driver behaviour at neighbourhood level, inductively analysing data generated by participants from four areas of the city, varying by density and centrality. Findings on the interplay between the behaviour and attitudes of the different urban dwellers in relation to transport and travel, and the structural impacts of urban form are presented following a case-study structure. This structure is designed to respond to the first of the qualitative research questions: *Why might density, as evidenced in the statistical analysis, influence car ownership, use and alternative travel choices?* Data from the low-density urban neighbourhood, the central neighbourhood, the peripheral neighbourhood and the high-density urban neighbourhood interviews are therefore presented in individual sections. This allows for ready comparison of contrasting neighbourhoods. Furthermore, this structure also situates the analysis of participants' comments within their geographical context. Similarly, summary details about the research participants are tabulated at the start of each section,

recognising that gender, age and household context can also inform perspectives on urban form and mobility. Acknowledging the narrative context of the extracts, data are as far as possible presented in large segments rather than as single words or phrases. As well as respecting the individual voice of the participant, this approach allows a trajectory of thought to be traced and speaks to the validity of the research by demonstrating a holistic, grounded approach.

After introducing the participants, the section concludes with a discussion of contrasts and connections between the drivers and non-drivers in that neighbourhood. On the basis that the application of the sampling protocol produced distinctive results in the different geographic areas, the space devoted to each neighbourhood reflects the range of views from participants interviewed in that area.

7.2 The Low-Density Urban Area (*LoUrb*)

Table 5.1: Participant Data - Low-Density Urban Area

Location	Participant	Age band	Household Structure	No. of Cars	Driver Status
Low-density urban	David	55-64	Single & elderly parent	1	Current
	Diane	65+	Couple & 1 child	2	Current
	Daniel	25-34	Couple & 2 children	2	Current

The car is very much the dominant form of transport in this neighbourhood. From one perspective this is suggested by the fact that, in this area, the sampling protocol generated *only* contacts with current drivers, therefore this section necessarily deals only with the contrasts and connections between participants classified as current drivers. However, beyond this observation on the sample, the status of the car within this neighbourhood was evident in two other ways. Firstly, both interviewing and the area-

profiling process involved site visits at different times of day and evening, during both the week and at weekends. Although there are small parks and local shopping areas within easy walking distance, a lack of pedestrian traffic was notable throughout. However, although this neighbourhood provides a pleasant, leafy environment with wide streets and pavements with little traffic and generous off-street parking, pedestrian traffic consisted only of the occasional dog-walker or jogger.

Secondly, although on occasion preliminary contacts and research participants in other neighbourhoods could not identify a potential interviewee who was not a current driver, in no other area was the request considered extraordinary. Applying the sampling protocol for LoUrb, it became clear that the idea of *not* using a car as the primary form of transport was associated with disability and infirmity or otherwise considered an aberration:

Not unless you find some kind of eco-warrior or something...
(Daniel)

7.2.1 Daniel

Daniel, the youngest of the three low-density urban participants, is explicit about the relationship between the availability of parking space around the property and the ease of keeping cars. The family live in the downstairs section of a large villa conversion and he notes that in addition to their vehicles, their upstairs neighbour has three cars and that there is easily space around the house to accommodate more. They currently have two cars: as well as his “commuter car”, there is a 4 x 4 which his wife Harriet tends to use. Harriet works in London three days a week, taking a taxi to the airport or train station and commuting from there. Her larger car is in use for taking the two children to school and nursery, for her own needs at the weekend and for the two days when she works from home.

Daniel has a high annual mileage because of work demands: the couple's routine of commuting and work since they moved to the area three years ago are the opening topic of his narrative. Although he occasionally works in Glasgow Centre, his main workplace is in Edinburgh and he travels around 400 miles a week by car. However, he is indifferent to cars beyond appreciating them for their instrumental value. When he does work in Glasgow, he takes the train. He cites both the inconvenience and the expense of parking:

I'd always get the train because the transport's just so easy. It's much cheaper than to park, so I'd just get the train rather than park, it's much more convenient.

However, the children are a complicating factor in this equation. When going into the city centre means taking the two children, the car is strongly their preferred option. When he recalls taking the train to the shops the rhythm and repetition in Daniel's language reflect an accumulation of stresses:

...if you're going shopping with children you've got bags and you've got children to manage, it's just getting them in a train with your bags on time, and then they run around and cause chaos, and then you've got to walk the other end up a big hill, it's just not worth doing, it's more hassle than it's worth.

Although his own verdict is that it "sounds pretty sad", a by-product of the inconvenience of taking the car into the city centre is that the family spend much of their leisure time in out-of-town centres that are easily accessible by car. At the neighbourhood level, the children like to cycle and the family do walk recreationally - Daniel has also taken part in a charity walk within the last two years - however, they tend to drive to a large park nearby for this exercise so that if the children tire both they and their bikes can be transported home in the car. When socialising as a couple, they will use a taxi.

7.2.2 David

David is single and without children. Although he has lived in the South of England for most of his adult life, he was originally brought up in Glasgow and still has family in the area. He comments that the house is large for a single man and he occasionally has relatives to stay. At present, his elderly mother - as he puts it, “increasingly frail, but still able to look after herself” - is living with him.

David’s pride and joy is a classic, high-performance vehicle parked in the driveway:

...which you probably noticed, a car that is probably the last of its line.

He enjoys driving recreationally and has previously gone on motoring holidays across continental Europe. Like Daniel, he does a high annual mileage in the course of his work but travel is something he actively enjoys as part of the job:

I've always liked driving, I learned to drive when I was 17 and I've been driving every since. Yeah, I love driving. I still enjoy driving. So it's something I'd be very reluctant to give up, heh! And I've always liked big cars, so uh...

Much of both his working and social life takes place outside or at the edge of the city and he is predominantly a car-based traveller. However, for travel within Glasgow, his preference is for the train:

Well, Glasgow I think is greatly blessed in its urban rail network, I mean outside of London it's one of the best suburban rail networks in Britain, one of the better ones in Europe, I would imagine. These electric trains north and south of the river are very good, and it's the half-hourly service that's pretty reliable, it's not very expensive, and I use it a great deal because it's only 7 minutes into town. And many people use it, it's very busy, it's very popular, and it...doesn't make sense to take a car from here

into Glasgow if you don't have to. Because of parking and congestion, so I think it's just for perfectly practical reasons. I'm glad it's there, I use it a great deal.

David introduces the topic of urban train travel as one of the advantages of living in Glasgow within his narrative. Although a car enthusiast, he both explicitly and implicitly (see above) describes it as “less stressful” than travelling by car in the city. He also uses the train if he is travelling to Edinburgh because of the congestion getting in and out of the city centre around rush hour. Other than this, the only mode of transport he uses has been to walk home from Central Station on a couple of occasions when he has missed the last train. He has no concerns with walking in terms of safety:

I never gave it a second thought. Maybe I should have done, but I didn't.

Nevertheless, he is unenthusiastic about the experience as it involved walking down “what must be one of the most hideous streets in Glasgow.”

7.2.3 Diane

The third LoUrb participant, Diane, has lived in the neighbourhood all her life. Now in her mid-sixties, she lives with her husband and the youngest of her three children. She is very active professionally and involved with a number of different voluntary and community-orientated organisations across the city. As well as falling within the sampling framework, Diane was referred as a possible participant by two different people on the basis that “she knows absolutely everyone” and might be able to introduce someone from the area who was not a current driver. The family have two cars: a people-carrier mostly used for carrying shopping or any large items; and a small energy-efficient model, which Diane has for daily use.

Diane is the most car-dependent of all the interviewees in the study. This is particularly evident as she is very attached to the local area and, as might be expected from a long-time resident, she is familiar with different shops in the area. During the course of her narrative she discussed both her own local favourites and those that her family have used. She will also eat out locally with friends from the neighbourhood and further afield. Generally even short errands are done by car.

Although aware that she is entitled to a free bus travel because of her age, she has not yet applied for a pass, saying “that’s an example of how often I use buses...very rarely”. She is also aware that there is a good local train service, mentioning that this is her husband’s preferred mode of travel into the city centre. She declares applying for a bus pass to be one of her New Year’s Resolutions, a remark more redolent of good deeds than something offering practical advantages. More than once she indicates that she *feels* she ought to be travelling using other modes - although there is no clear explanation of why. Whilst on the topic of her youngest son, who enjoys cycling, she says as an aside “I should walk more, unquestionably.”

In similar vein, at one point Diane exclaims that the amount of driving she does for short local trips is “my shame!” Although this occurs in the semi-structured section of the interview, the question of how she travelled about the local area followed casually from her discussion of meeting friends in a nearby café for lunch and considerable care was taken to avoid any sense of agenda in the research, beyond that of understanding how people relate to their neighbourhoods. Diane goes on to sandwich justifications for not walking between that declaration and the acknowledgement that it would be possible to walk:

It's a wee tiny car! But it's usually because I'm in such a hurry and I'm dashing from meeting to meeting, and appointment to appointment.

And I suppose it is just planning really. I mean you walked today; I could do it³⁹.

7.2.4 LoUrb Contrasts and Connections

From the perspective of the sampling protocol, Daniel, David and Diane have common ground in that they live in the same neighbourhood and all drive as their dominant modes of transport. The two men both work and socialise outside of the city and in many regards exhibit similar travel behaviours. Although the car is their primary mode, when moving within the city they will choose the train as more attractive, citing the stress of parking and congestion. For David, the choice is a low-key, practical decision: it simply “makes sense”, whilst Daniel emphasises ease and convenience.

However, their attitudes diverge on two counts. Firstly, train travel is transformed into an unhappy and stressful experience for Daniel on those occasions when he has to take the children, to the extent that despite a slightly negative attitude towards out of town shopping, it seems attractive in comparison with negotiating children and bags and hills to and from the (nearby) city centre.

Secondly, despite very similar travel behaviours, the two men have very different attitudes towards cars and driving. For Daniel the car simply serves a functional purpose, the ease and convenience of which he will happily exchange for another mode should it fail to deliver. In contrast, David relates positively to both the car as a desirable physical object and to driving as a satisfying experience as well as an instrumental activity. The combination renders car use a precious thing, which he would be “reluctant to give up”, defended even in the absence of any threat.

³⁹ The interview was carried out in Diane’s home. When I arrived she asked if I had any difficulty finding the house and how I had travelled.

Diane can be distinguished from the other LoUrb participants by both travel behaviour and attitude. Firstly, she is the most car-dependent of the three; almost all of her travel is done by car. However, ironically for someone who frequently makes very short trips by car, the second feature that distinguishes Diane's narrative from the other LoUrb participants is that her narrative - and her choice of personal vehicle - indicate aspirations towards an environmentally-conscious lifestyle. In the same way that Daniel's recollection of taking the children on the train (where you have to go up a *big* hill) also serves the function of validating his choices, Diane's language mimics her understanding and rationalisation of her travel behaviour: the car is not merely small - it's wee *and* tiny; she is in *such* a hurry *and* dashing; both meetings *and* appointments are duplicated. This weight of emphasis is marshalled to balance the wider framework implicit in the narrative where Diane positions frequent short-trip car use negatively between an expression of shame at her current travel behaviour and speculation over how she potentially could act.

7.3 The Central Area (*Central*)

Table 5.2: Participant Data - Central Area

Location	Participant	Age band	HH Structure	No. of HH Cars	Driver Status
The Central Area	Alistair	35-44	Single	0	Potential
	Andrew	25-34	Single	0	Potential
	Amy	45-54	Single	0	Potential
	Alison	45-54	Single	1	Current
	Abigail	55-64	Couple	1	Current
	Arthur	25-34	Couple	2	Current

All six Central participants are of working age, from their 20s to their 60s and there is an even balance of gender. It would have been possible to extend the sample of either current or potential drivers without difficulty. The Central neighbourhood offers both a very high level of local amenities

and good accessibility outside as well as within the city; it could be considered the ideal environment for people who would prefer not to drive. However, for people who have chosen to live in the area where a car can be as much of an inconvenience as it is an asset, both current and potential drivers from the Central area all have positive attitudes towards driving, at the very least regarding it as a useful skill and, in some cases, actively enjoying it. This section first introduces the three current drivers and then goes on to outline the travel behaviour of the three potential drivers.

7.3.1 Alison

Alison is a relatively low-mileage car user despite working regularly in London. There, her preference is to use buses after travelling from Glasgow by train. She has been delighted with the effects of the London congestion charge, facilitating bus movement around the city. However, despite a dislike of city traffic, when a journey involves an interchange, she will use the car for work purposes within Glasgow, as crossing the city and changing buses makes travel times both long and unpredictable. She tends to shop locally, carrying groceries home; although with her car she can reach a range of different supermarkets it is difficult to park locally, so she has an arrangement with a friend, also in the LoUrb neighbourhood, to use his private parking spot. Nonetheless, of the current drivers in the Central area, Alison is the most enthusiastic about car use, describing driving as relaxing and her favourite mode of transport.

Through her work Alison has lived in a variety of places, including two large cities in the U.S., and has previously used a bicycle for day-to-day travel. However, she is not comfortable on the roads in Glasgow and although she will occasionally substitute a bus trip for a cycle ride, she generally cycles recreationally in the park now rather than using the bike as a mode of transport.

7.3.2 Arthur

One of the youngest participants in the study, Arthur, lives with his partner. Arthur comes from the highest mileage household of the Central neighbourhood participants. As with all participants whose personal mileage was ranked as high, this was because of work-related travel. The couple have two cars: Arthur's company car and another vehicle, which they share. However, in terms of his attitude to cars, he distinguishes between the work vehicle and the classic car that the couple use together:

It's quite old but its in really good condition so its ideal for taking away at weekends, camping or going on a trip or ...its ideal for just the two of us [...] We just really enjoy it and I, eh, saw it and well I didn't see that particular car but I just began looking at old cars and thought 'what's nicer than an old car?' Maybe it's precipitated by having a company car, which is just an ordinary family saloon, which I'd never have chosen for myself. I don't have a choice in a company car. I just get given one, so I'd never have chosen that kind of car for myself. Its not...there's nothing....its very ordinary and non-descript. There's nothing fancy about it, it's just a plain car and so this [*their classic car*] is a bit of a luxury really. This is a car I just love. (Arthur)

The couple use the classic car as a recreational vehicle and refer to taking it when they go away for the weekend, or camping. The company car is used for work journeys which involve multiple locations. This might be to Edinburgh, with further trips branching out from there, or to multiple locations in and around the city. When work trips have one destination point, regardless of whether that is within Glasgow or to another town or city, Arthur prefers the train for speed and the convenience of not considering parking, distinguishing between the pleasure of driving the car he is attached to and one which simply has utility value as a form of transport.

Arthur is also a recreational cyclist. However, his most recent job is based relatively near to Central and he plans to try cycling to work in the summer:

Now that I'm working back in Glasgow, I'm going to cycle to work and that'll be really good because it's not too far...it's a bit too close to be reasonably driving it. You could walk it, you could cycle it, but taking the car you feel quite guilty because it is quite...a short journey. So I'd like to start cycling. It'll be no bother - I'm sure it'll be...I'll be able to cycle up there in ten, fifteen minutes.

Considerations of time (cycling wins over walking) are balanced against the idea of what is “reasonable” to drive in terms of the length of the journey.

7.3.3 Abigail

Abigail and her husband have two adult children, both of whom have left home and live with their partners. They have only lived in Glasgow since they moved to Central, less than two years ago. Before then, they had stayed in a variety of locations in smaller towns with access to both Edinburgh and Glasgow, where they have business interests. Most recently, they lived for some year in a large villa in a town within easy commuting distance of Glasgow. Abigail's was the first interview where change of residence was paralleled by change in car ownership as well as changes in travel behaviour:

We had two big cars you know, and they've both gone because we went down one day and turned the ignition on the Merc and it went 'FFFFT'; and the guy from the RAC came out and said look, if you are not running this car on a regular basis, get rid of it 'cos you'll just need to keep buying batteries. The kind of cars they are, they need to be out and about all the time. So it went, and we've got a wee Honda. (Abigail)

Abigail told this story as a comical anecdote and later in the interview we returned to the topic of life with one small car. There were no difficulties

between the couple in sharing the car; they had also begun to use trains and, more rarely, buses for visiting friends and family across the city. The car was mostly useful for longer journeys, for visiting friends and for work in other cities, although Abigail's husband has taken to using the train to visit Edinburgh unless he will be travelling back late at night. The couple will share a taxi returning home at night from friends' houses or a night out.

The major change wrought by living in a less car-dependent location is a shift to walking as her primary mode. This includes walking to local shops (as opposed to taking the car to the supermarket every week and "loading up"):

I've found that because everything's so accessible ...you walk, and although like the [shopping centre] is quite far away⁴⁰, I wouldn't dream of driving, as, funnily enough [my husband] said to me one day, I'd been at [the shopping centre] that evening, 'Did you get a cab?' - 'No, I just walked.' You know, you don't think about it. So I am, I am still having a certain level of exercise as well. Whereas people would think you know you're in the town and things are accessible, you don't have any exercise and I mean I'm not one for going to a gym - that's a mindless waste of time as far as I'm concerned (Abigail)

Notably, although the couple both consider the shopping centre to be at some distance from them, it is now within a radius that Abigail "wouldn't dream of driving". She continues to reflect on the increased levels of exercise in her life since the move, later making a mock bicep to show me laughingly.

7.3.4 Andrew

It is not only the current drivers in Central who are enthusiastic about the car. The youngest participant from Central, Andrew, is classified as one of

⁴⁰ Approximately 20 minutes walk at a brisk pace.

the potential drivers since he does not currently own a car or regularly drive. He originally came from an industrial town in Scotland with “a lot of residential outlying areas and what-not and you really, you really would probably need a car...If your car was in the garage or something, you'd be climbing the walls.” However, for him the car was not just a necessity: Andrew talks of learning to drive and being given a car by his mother as a rite of passage which ‘opened everything up.’ Transport features heavily in Andrew’s narrative and the sections of the interview that deal with cars exhibit his most emotionally intense language. His early narrative includes an affectionate reminiscence about several of his early vehicles including:

I got an old Audi sport that still had West German plates on it and this car - I loved that car - you know it was basically...it was a real joy to drive! (Andrew)

Andrew tends to travel about the city by walking, underground or taxi; buses take too long moving across the city and he dislikes the fact that people (*anyone* - he is not speaking of himself here) have to stand in uncomfortable conditions. As with Abigail and her husband, the change of residence unexpectedly precipitated a change in car ownership:

I gave up my car when I moved to the city. Em, because when I first arrived here it sat up in a car park - I even forgot to give somebody a lift down to a train station one day because I just hadn't used it - I just forgot it was there and basically...I gave it away and I've never...well I have driven since then. I've not actually taken the bother of getting a car - I feel I save a lot of money, when I get up... by where I live I save a lot of money because everything I need is here. There's banks here, you know ... I can hire a car if I need one, hire a van if I need one⁴¹, there's train stations everywhere, there's a bus takes me out to the airport, so I feel that I don't need a car...I don't think I want one either, so it's just everything's quite handy, handy for me. (Andrew)

⁴¹ Following up later on Andrew’s comment that he has driven since then, he has hired a vehicle for moving furniture on a couple of occasions and would rent a car if convenient to take a trip.

The emotional engagement to cars remains: it is something which he “gave up” and the narrative is permeated with a sense of doubt (“I *feel* I save a lot of money”; “I *feel* that I don’t need a car” [emphasis added]) and surprise (“I even forgot..”). Nonetheless, the dominant construction of what makes sense is financial and now getting another car would be a bother, which (although again, doubtfully “I don’t think I want one either”) he doesn’t want to undertake.

7.3.5 Alistair

Alistair is single and mid-career; over his professional life he has worked in a range of managerial positions in and around the city centre. He has moved home several times, going between a low-density suburb of the city and Central. He is currently classified as a potential rather than a current car user as his history of car ownership has followed a regular pattern, tracking his house moves in and out of the city. Whenever he has moved to the suburbs he has bought a car, precisely for the purpose of commuting. There are both push and pull factors involved in this behaviour.

From the pull perspective, when he is living in the suburbs Alistair values the private space of a car at the end of the working day and the geographic separation between work and home. The push factor towards buying a car for suburban living is an intense dislike of public transport: “I hate public transport. I really *loathe* public transport”. Alistair’s antipathy towards lack of control extends to discomfort with travelling as a car passenger:

Interviewer: So how often are you in a car as a passenger?

Alistair: Very rarely to be honest with you. Oh - not a lot I'm afraid. Once a blue moon. And I hate being a passenger.

Interviewer: Yeah?

Alistair: Yeah. I hate it.

Interviewer: Why's that?

Alistair: I need to drive. I get sick. I get car sick...I also am a bad passenger as well. Like in terms of [*gesturing at imaginary driver*] 'What are you doing? You're doing *that* wrong! You're doing *that* wrong! You're doing *that* wrong!'

Alistair walks a lot - including around his neighbourhood for relaxation - or takes taxis within the city for speed. His shopping is generally done locally as well; when asked about it, he pulls out a canvas shopping bag he carries with him in case he sees something in the neighbourhood which he wants to buy.

7.3.6 Amy

Amy is the third of the potential drivers in the Central area. Although she has lived in several UK cities she has been settled in Glasgow for over a decade now. Like Alistair, she has a well-established career and is single. During her narrative she talks about her neighbourhood, where she spends much of her social time. She frequently eats out, meets friends and colleagues for drinks in the area or within walking distance, and has friends to stay. When visiting friends in other parts of the country, especially rural Scotland, she hires a car. On these occasions, and on behalf of visitors, she is annoyed by the difficulties of parking in the area. She is also incensed by the charge for a residents' permit, which authorises parking but does not reserve a space:

Permit parking, last I heard, it was about two hundred and fifty thousand, two hundred and fifty thousand... [*stops suddenly, realising what she has just said*]. Two hundred and fifty pounds [*laughing*] - so that's a lot. (Amy)

Her own travel to work is a combination of walking and using the train. Her shopping, like her socialising, is also done by way of walking locally.

7.3.7 Central Contrasts and Connections

As well as high levels of accessibility reducing the need for a car, the combination of density and centrality has a double impact on car ownership: parking space literally comes at a premium.

People have got parking *arrangements*. Folk are *buying* parking spaces and people are renting *out* parking spaces. It's such a valuable commodity. (Andrew - original emphasis)

Alison, Arthur and Abigail, the three participants who currently keep cars, cope with this by using a combination of parking permits bought from the local council, an agreement to use a parking space at a friend's home further out of the city, a parking space that came with house purchase, and a private parking space bought for fifteen thousand pounds.

However, the issue of parking is not only a concern to the current drivers. Considering attitudes towards cars and driving, although the other three Central participants do not currently keep a car, each of them can still be said to identify as a driver in some respects, in that they all at some point displayed awareness of, and often a degree of indignation about, traffic patterns in the neighbourhood and, in particular, where and when parking regulations apply.

Summarising the direct impact of parking constraints on the behaviour of the Central residents, Alison and Andrew found that the distant or inconvenient parking in Central reduced their car use (in Andrew's case, he ultimately gave his car away) and shopping behaviour whilst Amy specifically states that inadequate parking facilities are the reason that she has chosen not to keep a car. Additional to the inconvenience of organising parking, satisfactory local accessibility to shops and leisure facilities, alongside good connectivity with the wider transport network within and beyond the city, renders the car surprisingly redundant, bringing radical changes in car ownership and driving behaviour.

The travel behaviour of *all* the Central participants is remarkably similar. For recreational purposes or work and social trips involving interchanges outside of the city, using a car is the norm for all Central participants, not just the current car owners - the three potential drivers have all rented cars at some point. As Alistair points out, “obviously the car firms are in the city centre, so it’s easy access to get to”.

With regard to work journeys specifically within Glasgow, mostly, the Central participants walk or take public transport, with a preference for the underground, trains, taxis or car and, as a last resort, the bus. For the current drivers, the tipping point between public transport and driving is time and the inconvenience of interchange between modes.

In terms of more active travel, although Arthur has plans to try it, none of the Central participants cycled as a mode of transport at the time of interview. Despite a dislike of driving in the city, Alison will drive within Glasgow when her journey involves crossing the city and changing buses, as the interchange makes travel times both long and unpredictable. The density of traffic within the city also discouraged her from functional cycling and she contrasted Glasgow and the discontinuous, multi-purpose bus/taxi/cycle lanes with dedicated cycling lanes in other cities where she had lived.

However, overall the combination of good connectivity and living in a mixed-use area has changed the amount of walking which all of the Central participants do. Walking as a travel mode and an important aspect of urban life was regarded very positively by all Central participants and associated with taking more exercise and feeling good. Although this is something they relate to the quality of the urban environment and have come to value, for relaxation and for health reasons, it seems to have been a spin-

off benefit of changed travel behaviour rather than an objective⁴². Abigail is specific that a dedicated exercise period such as at the gym is “a mindless waste of time”, although she is proud of the benefits that have inadvertently come from her more active lifestyle.

Notably, an emotional, even passionate attachment to cars and driving had no bearing on driving behaviour. Although slightly bewildered by his own lack of need for a car, in Andrew’s case, he has decided that a private car is unnecessary. Even in the two-car household, Arthur’s love of their classic car is distinct from his feelings about the company vehicle, the utility of which he gauges on the same basis as the other Central drivers make travel choices.

7.4 The Peripheral Area (Peripheral)

Table 5.3: Participant Data – Peripheral Area

Location	Participant	Age band	Household Structure	No. of HH Cars	Driver Status
Peripheral Area	Cindy	65+	Couple	1	Potential
	Claudia	65+	Couple	1	Potential
	Carole	65+	Couple	2	Current
	Callum	55-64	Couple	2	Current
	Charlotte	45-54	Couple +2 children	1	Potential
	Colin	35-44	Couple +2 children	2	Current

As might be expected in a suburban location, all of the Peripheral participants were couples. Two had children living at home whilst the others had adult children who had established their own households. The sample has a noticeably older average age. Unlike the LoUrb area, there was no difficulty in finding potential drivers; however, they are all female,

⁴² A possible exception here is Arthur, since it is unclear whether feeling “quite guilty” about short car journeys is attributable to concerns about laziness, the environment or some combination of the two.

aged from their mid forties to their early seventies. Charlotte, who had only recently turned 45 years old, is distinctive in the sample in that she is the only person in the study not to hold a driving licence. However, she was included in the sample as a potential driver in that she would consider taking up driving again in the future and, as a functional cyclist, is of theoretical interest. As previously, this section will begin with the current drivers in the neighbourhood and move on to the potential drivers.

7.4.1 Callum

Callum and Georgia moved out of the city from the LoUrb neighbourhood, to buy a property when they started a family. Now that their children have grown, the couple do not connect much to the neighbourhood. The couple have a car each, which they both use for commuting to work. Callum's mileage is considerably higher as his work also takes him to England as well as across Scotland on a regular basis.

They follow the pattern of doing a large weekly supermarket shopping; Georgia usually combines a trip to one of the large supermarkets outside the local area with the drive from work, or to meet family. A high-mileage driver in his working life, Callum's leisure contact in the city usually takes place via public transport. Although he describes his relationship with the neighbours as 'cordial' he does not feel there is any sense of community in the area. Perhaps unsurprisingly, his social life is not based locally:

I have my hardcore friends and we tend to congregate elsewhere in the city centre. And that really is my circle away from here.

His leisure time social contacts take place in the city centre, which he reaches via public transport. However, although he is now being entitled to a free bus pass, he seldom uses it, since the train is his preferred option for both speed and comfort. However, even for this trip he might take the car if it is raining (the station is around ten minutes walk away). Despite the

presence of a very frequent service into the city, not having to sit in traffic is the priority attribute of urban transport, even for these leisure occasions. For return journeys later at night, Callum considers it “wiser” to spend money on a taxi, especially to avoid aggressive behaviour at weekends:

Callum:...But of a Friday night or a Saturday night if I were coming home generally my preferred option is a taxi, to be honest with you. Quite late on in the evening rather than face the zoo that is sometimes Central Station and / or the various bus stops in Central Station, again flashpoints and sometimes wiser to avoid entirely.

Interviewer: Have there been any specific incidents that have put you off that?

Callum: Och, I've been on trains where there are groups who are making their way home but have had drink taken, and young, aggressive, and just in general obnoxious to be in an open carriage with, so if I can avoid that I will. Even for a short 20-minute journey it's not a comfortable ride home. Not under those circumstances...So for the sake of a few extra quid if you have it to hand, then yeah. That is my preferred option.

7.4.2 Colin

Colin and his wife also moved to Peripheral from a higher-density urban neighbourhood similar to HiUrb. Having young children, their social lives are very family-centred and Colin describes moving to Peripheral, an area where they already had a wide family network, as being part of a ‘micro-community.’ Both of the adults own cars and use them for commuting. Colin’s attitude towards driving is indifferent: it’s for work, which is ‘just a money thing.’ Despite regular commuting into the city, Colin’s mileage is relatively low as some of the time he will take the train to work. Although Colin is a recreational cyclist he does not use the bike as a mode of transport, judging that the heavy traffic makes the experience both unpleasant and dangerous. Buses are dismissed as an option in comparison with the train because of the length of journey time and the difficulty of

gauging how long the journey will take: “with the train you know when you will arrive.” The choice to use the car rather than public transport is based on whether or not Colin has other commitments on the day and underpinned by free parking at his workplace:

If I didn't have free parking [at work] I would probably use public transport almost exclusively. Unless I desperately needed the car. (Colin)

As this final qualification indicates, the distinction between needing and wanting a car is very blurred.

7.4.3 Carole

Carole has recently retired and the build up of traffic in the area - particularly school run traffic - was a major and recurring theme in her narrative. She is animated recounting a story of being delayed by volume of traffic:

I was amazed at the number of cars that went past...massive cars, people carriers, big jeeps carrying schoolchildren...and I'm talking about schoolchildren that were almost young adults. And I thought 'this is ridiculous, absolutely ridiculous'...Why are you bussing these teenagers in, in cars and clogging up the roads with the result that I was late? (Carole)

However, Carole is very much consciously car dependent, in that she is aware of other options available but generally chooses to drive:

Interviewer: How would it affect your life if you couldn't drive?

Carole: Och, a free bus pass, no problem! No. In fact we both went into town on the bus the other day and it was actually good fun.

However, this trip is something of a novelty, since despite the fact that she does not enjoy driving and is not confident behind the wheel, it remains

her preferred mode of transport: for Carole, “convenience” trumps all other considerations.

I don't see many changes around here at all. Apart from...cars...Well we've got two cars. When we had the children I needed two cars, I didn't have two cars! Cos I used to run everywhere and I was slim in those days. You know, I used to run one family car.... Now you go down this road...count how many cars are in the drive and there's about two or three cars to each household! So people are jumping in and out of cars so you don't see them the same, you know. There's not the same traffic, people are not walking around as much as they used to so I think that's probably one of the things I'd say...

Later in her narrative she places car use in opposition to fitness, both for herself and for others. Nonetheless, she gives no indication that she might now change her travel behaviour in the light of this.

When talking about keeping her own car - which she considers the ‘second’ vehicle to her husband’s first - the concept of ‘need’ is reworked:

You see I used to use the car for work, that's the only reason I have a car, a second car, because I needed one for work... and I would get rid of it because we only need one car but I wouldn't get anything for it but it's actually quite handy, it gives us a bit of independence if George's got to go somewhere and I want to go and meet somebody, and this friend I've got's got Parkinson's, so Gloria really can't walk, or we would go [on] buses, so I take her in her wheelchair in the car, so it's quite good, I would say. But it's an extravagance we could do without, a costly one. But at the moment it's ok, it's a small car so we can nip it into wee corners and ... [tails off]

Within the close weave of poor resale value, the car being useful, not relying on her husband, supporting a sick friend, the expense of running a car and the mitigating factors of its modest size and practicality, is buried the idea that she ‘ought’ to be using public transport. Notably, the second car gives them independence from one another -“if George’s got to go somewhere and I want to go and meet somebody”. Sharing one car does not appear as a possibility within this framework.

7.4.4 Cindy

Cindy is the oldest of the participants in the study. She lives with her husband, who had a major operation last year and is still recovering. This has affected life for both of the couple and the ability to drive has taken on a new significance:

I just don't go out now very much because I'm afraid that he might fall, he still can drive; can't walk very well but he can drive, so he goes out a couple of times a week. He manages the supermarket and the doctor's surgery and that's it.

She travelled by bus once to visit him in hospital but, although she is happy travelling in and out of the city on her own, found the more complex journey with less frequent connections time-consuming and stressful. Subsequently, she travelled by taxi, although did not visit as often as she might have because she felt the cost was unreasonable.

Cindy learned to drive in the 1960s. Her motivation for taking the test was a dare, rather than the fact that "you felt as if you were really inadequate if you couldn't drive." She passed on first sitting but despite this success she did not enjoy the experience and since then she has not driven a car. This is something she now regrets, especially as her husband is in poor health. However, although frustrated that she cannot support her husband more, she has not reconsidered taking up driving again - the utility of a licence still has a social basis for her:

No, the traffic's too busy. And age comes into that too, when you're younger you don't have fear. I can see things that are never going to happen now. You know, you...anticipate what's not going to happen when you're older and the traffic's too fa...I wouldn't drive now. Although I have a driving license - it's a very good form of identification. So I just keep renewing it for that reason.

Cindy will take either the train or the bus into the city when she goes out to shop or meet friends - her decision depends on whether her destination is closer to the train station or one of the bus routes. When going out as a couple, either socially or for shopping, they travel by car:

Cindy: ...Greg hasn't a clue what to do on the bus.

Interviewer: Was he never one for bus travel?

Cindy: Oh he did when he was younger, but eh, he's...if we were going into town for some reason he would take the train rather than get the bus.

Interviewer: Why's that?

Cindy: I don't know. He just...he says that...Well, he went on the bus one day with me to get his eyes tested. We were going to [the far side of the city centre]. He got on, I said 'if we get a Sprinter bus that gets us right up to [the shop] and you've only got a wee bit to walk'...Well, of course they're small buses and there's no leg room and he's got quite long legs, and he says 'oh, I wouldn't'... I think we got ourselves down to Central Station and got a train back home. [laughs]... So that's...

7.4.5 Claudia

Claudia is the second of the potential drivers from Peripheral. She previously lived in one of the city's tenemented areas, initially with her first husband and then, after a divorce, on her own. When she remarried, she moved into her new husband's home on the periphery of the city. Like Cindy, Claudia seems to feel that she *ought* to drive. She regularly used a car in the past but was without a vehicle after her first marriage ended, and has decided that she does not want to start driving again. Whether resulting from social norms, pressure from her new husband or some other combination of influences, her monologue is one of assertive resistance to unheard voices:

I wasn't a person that loved driving, no I just, I did it and that was all. No, it was never a sort of thing, I know some people say, 'oh, I love to get around in my car', but no, it... not at all. And I won't. Every so often it gets mentioned and I think no, I'm not doing that. There are times it would be convenient, I mean Gerry had a sore shoulder in December and wasn't able to drive so it would have been very handy then if I had driven us both, but having said that, it wasn't really a problem, I just did bits of shopping every time I was out, I brought some stuff home and for heavy stuff I...I went to the friend round the corner and got bottles of fabric conditioner and any heavy things you know, so it wasn't a problem. But it would be handy. But no, it's not going to happen

However, despite the "village" centre to the area, the predominance of car transport can make neighbourhood life relatively isolated for the other potential drivers:

If you are out, people walking up and down the road, people will say 'good morning' to you, you say 'good morning', if they're out walking a dog, you'll maybe clap the dog or whatever - but very often it's 'toot toot' and you think 'who's that?' I'll wave anyway cos I don't know who it was, I can't really see'...which you often can't unless you recognise the car, it's quite difficult to recognise who it is, and I think that probably does make a difference to... seeing people when you're out.

Claudia is one of two peripheral dwellers who made a transition to the peripheral neighbourhood from a high-density area. In both cases, family connections provided the impetus for the move. However, in Claudia's case, despite the fact that she went from living alone to joining her husband, the move was a relatively isolating experience. The largest part of Claudia's narrative concerned the topic of adapting to her new home and the friendships she developed on her commute to the city. "The Train Girls", as the group call themselves, formed the foundation of her social network in the neighbourhood.

7.4.6 Charlotte

The last of the potential drivers, Charlotte, lives with her husband and two teenage daughters. Charlotte is the only participant in the study who does not have a driving licence as she has not passed a driving test. However, she does not rule out taking up driving again in the future and has been classed as a potential driver. Her husband is a recreational cyclist and encouraged her to join in with his hobby. After a time, she tried cycling the short journey to work. She gradually built up to using the bike as her main mode of transport. Last year she cycled the length of the UK, from Land's End to John O' Groats, and being a cyclist is something of an identity as well as her preferred mode of transport. Although conscious of the dangers of urban cycling and indignant at poor road provision for cyclists, she values her fitness, the freedom and also the sense of being different. Charlotte considers her mobility as good as or better than that of her driving friends.

7.4.7 Peripheral Contrasts and Connections

All three of the current drivers live in two-car households, where the cars seem to be personal vehicles - a "his and hers" system of ownership operates. Again, high mileage driving is associated with work but the two working drivers are heavily reliant on their vehicles for social and shopping trips, generally trip chaining en route to and from work. Carole still assesses driving as her primary mode but, since her retirement, will sometimes walk to the local shops rather than always driving to the supermarket. She explicitly opposes walking and driving on several occasions, referring to her younger and slimmer days when she walked frequently but despite making this connection in that abstract it has made no impact on her travel behaviour. Although she doesn't walk often enough to experience any perceptible health benefits, she is enjoying reconnecting with neighbours she had long forgotten about. Colin acknowledges that he

does not need to drive most days but attributes his first choice mode of commuter car use to the attraction of free parking at his work site.

Nevertheless, all the drivers occasionally use public transport for urban access. The train is the preferred choice as it cuts through congestion and, although Carole and her husband have been on the bus since getting free bus passes, this was a one-off novelty excursion rather than the start of a new habit and a shift of mode from train to bus. Callum is the only regular public transport user of the drivers, using it to see friends socially in the city centre as it allows him to have a drink while he is there. However, all of the drivers have similar travel behaviours in that rationalising their preference for car use is easily accomplished and poor weather will discourage them from the short walk to the train station. Callum's interview also includes a concern with safety and a concomitant sense of unease on public transport. Similarly, Cindy says in speaking of her husband, that "Greg hasn't a clue what to do on a bus". When asked about this, she gives physical discomfort as the explicit reason for his dislike of the bus. However, her first response was to say that it was something he did when he was younger and she is hesitant about why he would not now travel on buses; during the interview, the story about Greg's long legs came across as something of a diversion, skirting around her husband's insecurity.

Unlike the central neighbourhood, where multi-modal behaviour is the norm, the participants here show a clear division between current driver/potential driver behaviour. Cindy and Claudia travel as passengers for shopping excursions or on nights out with their husbands but otherwise have travel patterns not unlike those Central and HiUrb residents, using buses and trains as well as taxis; the distinction is that, although there are shopping and leisure facilities within easy reach, walking is not a normal part of their lives. Claudia has a stronger social network locally as a result of her "train girls" commuting days. Both women also experience some

sense of isolation in the neighbourhood relative to their more mobile neighbours.

In contrast, Charlotte very much enjoys her mobility, her fitness and also the sense of “being a bit different” that cycling gives her. Unlike Carole, she has no sense of needing a car to have independence from her spouse. She is not however in any way anti-driving and says if they move back to the rural south of England once their children have left home she will take her driving test, since cycling would not be suitable there. However, the very fact of Charlotte’s pleasure in her difference also illustrates the status of driving as a social norm in this low-density environment.

7.5 The High-Density Urban Area (*HiUrb*)

Table 5.4: Participant Data - High-Density Urban Area

Location	Participant	Age band	HH Structure	No. of HH Cars	Driver Status
High-density urban	Barbara	45-54	Single	0	Potential
	Beth	25-34	Single	0	Potential
	Brenda	55-64	Single	1	Current
	Bella	25-34	Living apart together	1	Current
	Brandon	35-44	Couple	1	Potential
	Boris	45-54	Couple +1 child	1	Current
	Bonnie	35-44	Couple +2 children	1	Potential
	Blair	35-44	Couple +2 children	1	Current

This is the largest section in the chapter, reflecting the more complex driver behaviours across a greater range of household types. In this mixed-use area with traditional tenement housing, households with and without cars alike display more complex driver behaviours. As with the Central neighbourhood, the age range of the participants covers five decades and the sample of both current and potential drivers could have been extended easily. The sample divides into four participants from couple households,

three of which have children living at home, three participants from single households and one participant, 'living apart together' with her partner. In the case of the latter participant, the couple are in a stable, committed partnership and spend much of their time together but have their own properties. Following the pattern of previous sections, the current drivers are introduced first with details of the potential drivers given thereafter.

7.5.1 Bella

Bella is from the north of Ireland and was attracted to Glasgow by a postgraduate qualification on offer. She and her partner represent the growing demographic trend of 'living apart together'; they each have their own homes in different cities and live together in them as much as work constraints permit. Although technically a single owner-occupier, she considers herself as part of a household with access to two vehicles. Frequent travel between two cities in combination with commuting by car to her work, also outside of Glasgow, makes her the highest mileage car-user from this group. Despite finding the heavy traffic irritating, she also tends to drive when visiting a nearby high-density shopping centre and displays an encyclopaedic knowledge of what parking charges apply at what times around different local shopping areas. She speaks admiringly of the local shops which have:

...everything that I could need in walking distance, you know? Butchers, post office, pharmacy, doctor's surgery, you know, baker's, fruit and vegetable shops, local type [small supermarket]-type thing, you know? All the kind of things that you needed on your doorstep if you had to get to them. A waxing shop! [laughs] A beautician, you know?

However, with the exception of vacations times, most of her shopping is done at different supermarkets:

Even though I do like the concept of the, "let's support local"... but then sometimes it's just easier, unfortunately to go to the

supermarket, and just get everything at one go...You know, I try to use the local shops and I use the farmers market because the farmers market goes to Queens Park once and fortnight, so I do try to support that, so it just depends, it varies. In the summertime when I'm [on holiday] I might use the local shops more, because I think "Right, I need this, this and this, I'll just run around and get it"; whereas [when I'm at work] is, "Right, what am I going to have to get done tonight? Right, I'm going past the supermarket, I'll go and get stuff on my way home" and get it, you know? It's kind of a convenience thing, so...

Unless they are meeting friends nearby, for leisure and social travel within the city, Bella and her partner will generally drive - or take a taxi if they will be drinking; they will also take a taxi for more local plans if it is raining or Bella is wearing her "teetery shoes". Bella tends to take the train into town if travelling on her own because the familiar reasons of congestion and difficulty finding a parking space and the cost of parking charges. Convenience is the key driver of her travel choices, and buses do not figure in the calculation:

Bella: ...I hate buses, I like the train...Cos I always had to use the bus at home and I ended up feeling sick and it was always busy and...you know? So...I think that's why...but I do like the train.

Interviewer: You don't really use the bus here at all?

Bella: I wouldn't...I've used it about three times. And it was just like 'how much is it?' AND they're like- they're so grumpy if you don't know what you're doing, you know they're not very kind of 'well, yes, well, I'll help you out dear', you know? It's like 'you should know'. They basically expect you to get on the bus and know how much it is, even though you've never done it before, and you have to have the right change and all this kind of...em.. So no, I don't use buses...I mean if I had to, you know, of course I would. But I haven't ever had to. And "have to" is a great master, if you have to do something you do it, if you don't have to do it, then you don't. I like the train, I go on the train, you know? It's handy, it takes me where I want to go as far as I'm concerned. If I want to go into town it doesn't take me anywhere particularly different from getting the bus, so I take that...I know how the train works, I know the train timetable, so ...I've no interest in getting the bus.

7.5.2 Boris

The other high-mileage driver is Boris, who also commutes by car to work outside of the city. Boris lives with his wife, who is visually impaired, and the youngest of their children, who is still at home. Unlike Bella, he does not enjoy driving, finding it stressful. Largely for this reason, he generally travels in the city by public transport. His preference is for using trains in and out of the city centre since “if you're working to a timetable then the trains are quicker and less crowded, in summary, than buses”, although he says that the timetables being posted at the bus stops has influenced how often he travels by bus. The family have contacts in other areas of the city and he is happy to use buses when not on a radial route to the city centre, although he does qualify this:

I would use the bus again during normal working...there's hours you ...you get sick of using it if you're trying to use it at eleven o'clock at night. It's, em...using public transport at eleven o'clock at night is not as pleasant as using ...you meet ... more unpleasant people at eleven o'clock at night than you do at six o'clock at night.

Like Bella, he is familiar with the range of local shops and eating places but does not really use them, again favouring a system of supermarket shopping en route from work. Although he says that he does not enjoy driving, the main consideration in this seems to be frustration with traffic. Boris enjoys both skiing and go-carting regularly: “I mean both of those...carting really gives you a heck of a buzz. As long as you're willing to stick your foot on the floor [he is grinning broadly]”. He is also a recreational cyclist and still goes on cycling holidays with both of his children. However, despite his adventurous streak - and one attempt at cycling the fifteen miles to work - he would not consider cycling as a mode of transport in the city:

Interviewer: Do you cycle in the city at all?

Boris: [abruptly] No.

Interviewer: You rapped that out with confidence!

Boris: Absolutely! I'm not courageous enough to cycle in the city.

7.5.3 Brenda

Alongside Bella and Boris, Brenda is the third HiUrb participant who falls into the “current driver” category. Brenda is widowed and currently lives on her own, although her daughter occasionally comes to stay. She brought her family up in the neighbourhood so is very familiar with the area. Like Bella and Boris, she uses the car for her commute to work. However, walking can also be counted as one of her modes of travel in that she makes regular use of local shops and amenities.

Nonetheless, Brenda enjoys driving generally, although makes the point that because her work is in an adjoining local authority area, she is travelling in the opposite direction from the bulk of traffic and is less troubled by congestion than those heading towards the city centre in the mornings. She has family connections in a small town in the north of Scotland and visits them regularly, travelling on a coach which takes her directly there. Brenda acquired the habit of taking public transport to visit her family when they lived in Edinburgh; originally she would drive when visiting but recalls:

I actually, when I was going through to Edinburgh before my family moved up North, I got so fed up and bored with the M8, that I started taking, first I started taking the train, then I got the bus through, cos it's just as convenient and it's a whole lot cheaper. And now when I go up North I get the bus. I'm not ...I enjoy, don't get me wrong, I enjoy driving but I cannot be bothered with all these tailbacks and....and I get bored on the M8. I just...and on the motorway I don't like having the radio on, so I get even more bored.

Around Glasgow, Brenda mixes car and public transport depending upon her destination. The journey to work is made by car and occasionally combined with a supermarket trip for bulk shopping. For local social meetings she will walk; a little further afield (from her descriptions, more than one and a half miles), she takes the car. In a pattern reminiscent of the Peripheral neighbourhood, she now seldom takes the car to the city centre, regardless of whether the trip purpose is social or for shopping:

I just don't think it's worth my while taking the car in...on a Saturday. Plus the fact ...car parking charges and...goodness knows where you can get parked now really when you think about it! [laughs]. No. I, in fact...I would now, really not take my car into the city centre. I used to, a few years ago...but now I don't bother about it...

Although at the moment a journey to work on public transport is nothing more than an occasional change in her habits, Brenda does not seem troubled by the possibility of life without her car:

When my car's off the road I actually take the bus to school and in some ways I quite enjoy it [laughs]. It's like a novelty, in the morning...sit back, relax, get the newspaper, bus drops me at the door. In fact...if I could...rely on myself getting up early enough, I'd be quite happy on the bus.

Although a car commuter, Brenda's attitude to car transport has more in common with the Central drivers than those in either of the lower-density groups in that there is neither an overt theme nor a subtext of "need". When it occurs to her that she would miss her bulk-shopping stop-off from work if she did not have the car, her response is humour, striking a caricatured pose as a "little old lady" when she speaks:

Well, that's the only thing...I would have to get a shopping trolley! [rolls eyes, mock appalled]

7.5.4 Blair

Blair and his wife Fern first moved to the neighbourhood just before starting a family. Like Bonnie and Fred they have two young children. They moved from another high-density area nearby and have one car. They each work at (different) locations outside of the city. Fern is the main driver as she uses the car to get to work and to drop off and collect the children from nursery.

If we're going into town with the kids, I would say on most occasions especially if it's for shopping trips, particularly a shopping trip we'll take the car, park it in a multi-storey. But if it's just a kind of hang about, leisure type of thing we'll probably all jump on the bus.

The family often travel by public transport within the city and much of their grocery shopping is done locally. Blair seldom drives unless he needs to take the children with him on a supermarket trip. The combination of children and supermarkets is not attractive without a car:

Em...getting to the supermarket, I mean again that's a bit non-negotiable as well - we take the car. It's hard to do it otherwise - it is hard. And it's usually something just one of us does. You don't want to take your kids to a supermarket if it can be avoided.

Until recently, Blair worked in the city centre and would take the bus, walk or cycle depending upon the weather. He is now working in a peripheral town rather than the city centre and takes one train into the city and a second one to his workplace. However, he has become accustomed to commuting by public transport and the couple see no need for a second vehicle:

Blair: Certainly working where I do it's not ideal to go the route that I do because it's quite time-consuming, although I do actually enjoy the journey in itself.

Interviewer: What do you enjoy about the journey?

Blair: Eh. Time. Space. Listen to the radio, etc. Relax. It's quietish and certainly mornings, late afternoons, going to and from work people don't want any fuss they just want to sit down, relax and switch off, you know? And that's...that can be quite nice, you don't get stressed, you don't get wound up, [smiling] unless of course your train's late, missing connections...

7.5.5 *Brandon*

Brandon originally came from a city in the north of Scotland but has lived in Glasgow with his partner Fiona for several years now. When he was nominated by a contact as a potential research participant, it was as a potential rather than a current driver. Having met him, it is easy to understand why: his preference is for using a motorbike and he is dismissive of cars both as a “boring” form of transport “they’re just dull...they’re totally dull [laughs] ... useful for carrying things maybe...” and for the pressure they put on other travellers. He is also specific, referring consistently to “Fiona’s car”. However, Brandon does also drive. He regularly borrows his partner’s car during the winter for travelling to his workplace, which is outside of the city. Brandon is the most multi-modal participant in the project: he cycles, takes the train in and out of the city and quite often walks to the city centre and to various sports venues around the city. He has used the bus service when living at a previous address in Glasgow but strongly favours the train access that the couple’s current location affords. This is based on an enjoyment of train travel, which he finds generally “quite a sociable thing”, although especially on inter-city journeys:

There's something nice about trains. I'd get the train a lot [between Scottish cities]...there's something really nice about sitting on the train...you can read, do crosswords, listen to music, sit and blether...you can take a drink if you want, take your pieces with you...eh...its much more...comfortable...a lot

more spacious. You can go and have a walk if you want. It's a lot more social thing as well...⁴³

And a dislike of both the physical and the social environment on buses:

Brandon:...you tend not to get leg room - which is a big thing for me... and you always, always get some kind of dodgy ned⁴⁴ at the back of the bus that will sit beside me and smoke...that does my head in as well. It seems to be a feature of Glasgow buses that...you could be guaranteed you'd have somebody would start noising⁴⁵ you up for reasons best known only to themselves. Aye...

Interviewer: Can you think of any particular incident?

Brandon: Oh, aye...just smoking's always a favourite [...] or you know, I'd have a hat on and trying to pull my hat off...I'm six foot two, you know?...I'm just like [here he gestures open-handed, indicating bewilderment/ exasperation]...What is it? You get verbals⁴⁶ as well ...but eh, I tend to avoid buses...

The fact that Brandon feels he is regularly harassed on buses is surprising to us both: as well as being tall and a generally confident person, because of his professional background he is accustomed to defusing challenging situations. He practices martial arts and is quite obviously fit and powerfully built.

However, although stresses on parking and levels of traffic in the neighbourhood do not exist to the extent that they do in the Central area, when asked if the couple have considered getting a second car, the challenge of parking is the main part of Brandon's response:

There's always a way round when we both need to go somewhere...I've dropped Fiona off...we've picked each other

⁴³ sit and blether [chat]...you can take a drink if you want, take your pieces [sandwiches]

⁴⁴ A derogatory term for "a young working-class male who dresses in casual sports clothes" [Collins English Dictionary].

⁴⁵ 'Taking the mickey'

⁴⁶ Verbal abuse

up, or you get a lift home from somebody. Two cars!...I mean it's hard to park one car round here...to park two would be [laughs]⁴⁷.

7.5.6 Beth

Beth is a young professional woman who has recently bought her first home after renting for a few years. She considers herself a confident driver and talks about her extensive knowledge of different 'shortcut' routes about the city, which she has learned due to having no patience with heavy traffic. She is interested in IT and uses the internet for much of her shopping with the exception of groceries. Other than online hobbies, she describes cycling as at the top of her recreational activities and values her fitness levels greatly. She also likes to run and is a functional cyclist, using this mode for commuting to work in another area of the city. The bike is also what she uses going out to visit friends and to pick up most of her shopping locally. However, she will borrow a vehicle from work when she wants to buy in bulk from one of the large supermarkets around the city.

7.5.7 Barbara

Barbara is single, having separated and then divorced within the last few years. She does not have any children. She has lived in various locations in and around the city both with her erstwhile husband and on her own. Shortly after moving to her current home, Barbara's last car was written off in an accident and she has not replaced it. Although she originally anticipated hiring a car for leisure purposes at weekends she has become an enthusiastic convert to public transport:

I mean I go over to Fife and I still hop on the bus! I still do it because I read, and it's brilliant and I don't get sick at all. So it's

⁴⁷ He does later go back to this and revise his position: the couple have talked about buying a dog and, were they to go ahead with that, they might also buy a hatchback car to travel with the dog more easily.

absolutely brilliant - I mean it's long, it takes a long time, but it's great, 'cos I just read.

Subsequently, she has found herself increasingly irritated by the number of cars in her neighbourhood and is passionate on the topic of what she sees as unnecessary car use:

In properties so close - I feel very strongly about this, in a certain distance from the city when the transport's so good why are we all buying, why buy cars? It is unnecessary. If you can't borrow a car from somebody, or double up with your insurance, em... or say 'Hey, when you're going shopping can I come with you?' You know? It's about - I, I, it's unnecessary for me to have a car. It's absolutely unnecessary and that's honestly the truth.

7.5.8 Bonnie

Bonnie and her partner Fred have two small children. Bonnie is the primary carer for the children and is self-employed and can work part-time, mostly from home. Fred works in the same industry but often travels for work and can be away from home during the week for extended periods. The household car is largely Fred's provenance in that he uses it for working away. In and around the city they walk or use buses and trains. Unusually, the family preference is for the bus. This is motivated by the difficulty of managing baby buggies up and down the long flight of stairs at the nearest train station; by comparison, getting onto the bus is relatively simple. When the adults travel into town they choose the train over the bus. Bonnie and her partner find coping with a car, rather than coping without one, a nuisance in the urban environment:

Why does everyone need to have cars the whole time? It's like a comfort thing and it's not...it's not good for money, it's not good for the environment...people have such attachments to their cars, it's like a pet, like part of their family sometimes.

Although they seldom use the car around the city, they do take it for visiting relatives in rural areas. In these cases, Bonnie is the main driver,

saying it compensates Fred for having to drive long distances to work in other parts of the country. The rationale for car use on holiday visits is a combination of interchange issues accessing rural locations and the “paraphernalia” that comes with having children.

7.5.9 HiUrb Contrasts and Connections

For public transport trips into town, the parents in this section favoured the bus over the train. Bonnie was explicit about the difficulties of the stairs at the local train station whereas Blair referred blithely to how they would all “hop” on a bus as an easy travel option. The other potential drivers differ on the subject of trains, with Brandon finding bus travel a literally challenging experience whilst Barbara actively enjoyed it. However, for the most part, the train is favoured for intra-urban travel because of its speed cutting through congestion and circumventing the problem of parking.

As with the other neighbourhoods, high-mileage driving is a work-related phenomenon. However, constrained parking seems to have an influence on decisions about car ownership and car use. Even the most car-dependent of the HiUrb residents do some local shopping and many of them socialise in the area with both local and visiting friends. These activities generate walking rather than driving trips; as in Central, both current and potential drivers cite the difficulties of finding a parking space, having taken out the car.

Driver behaviours in this neighbourhood are distinguished from those in both of the low-density areas in that there is a pattern of householders borrowing, hiring and sharing cars. Both current and potential drivers tell stories about parking difficulties: timing when to move the car, or parking illegally, and the difficulties of parking are a consideration in car ownership as well as car use. With regard to car ownership, the HiUrb neighbourhood

also demonstrates the phenomenon of households with two working adults choosing to share one car. Even in the households with two working adults and dependent children, participants share one car. Much of this can be attributed to constraints of physical space.

In the case of Brandon, the car explicitly belongs to his partner; however, for Bonnie and Blair, the jointly owned vehicle is considered the provenance of their respective partners. Despite these differences, both adults will drive at different times: Brandon, when travelling by motorbike is difficult because of the weather; Bonnie, to free her partner from driving when they visit relatives in rural locations; and Blair when he is on a supermarket trip with his children. Similarly, Beth and Barbara, the two participants without household access to a car, both borrow and hire vehicles as they consider it necessary.

The HiUrb sample did not include any examples of participants particularly attached to cars or driving (other than Boris with reference to go-carting!). Brandon's disregard for it as a mode of transport was based on its inadequacy in dealing with congestion compared to his motorbike. Frustration with what is perceived as excess car use is another distinguishing phenomenon of the area. In the midst of a story about going to football matches with different friends who live outside of the city, Brandon breaks off mid-narrative:

I've got a friend comes through from Edinburgh every week, Keith, he drives through, to my continued amazement...he gets here and just starts whining about the M8. And I'm, 'well, take the train!' You know? It's so much easier! It's forty five minutes as opposed to....two and three quarters is the longest it's taken him to come from Edinburgh...two and three quarter hours [sighing, exasperated]...

This frustration with what is seen as unnecessary car use can lead to a complete reversal of the commonplace understanding that it is necessary to have a car to cope - especially with young children.

A perception that public transport can be less stressful than driving is not exclusive to public transport commuters. Boris finds driving a relatively stressful experience and Brenda enjoys public transport commuting, albeit occasionally:

When my car's off the road I actually take the bus to work and in some ways I quite enjoy it [laughs]. It's like a novelty, in the morning...sit back, relax, get the Metro⁴⁸, bus drops me, at the door. In fact...if I could...rely on myself getting up early enough, I'd be quite happy on the bus.

However, this also makes the point that even in a well-served high-density area, for those who have *personal* car transport, driving is the default option.

7.6 Discussion

Cross-referencing the findings from the four case study areas provides a perspective on the relative importance of the roles played by density and centrality as factors influencing travel behaviours. The dominant axis along which findings were differentiated was that of density and non-density, therefore an analytical overview of findings about the relationship between travel behaviour and space will be given from the perspective of each neighbourhood.

7.6.1 LoUrb

The LoUrb neighbourhood stands out in that applying the research protocol succeeded in generating contacts only with current drivers. All participants were high- and medium mileage drivers and although much of their mileage was work-related, there was little use of other modes was evident, despite the proximity to the city centre and a range of local amenities within

⁴⁸ A free newspaper distributed on public transport

walking distance. However, driver behaviour in LoUrb can be compared with other neighbourhoods in one respect: even high-mileage drivers may modify their travel choices in the face of parking charges and congestion. The high-mileage drivers - one of whom is a very keen driver, valuing his car for its aesthetic as well as its functional qualities - choose train travel for work-related travel within Glasgow at peak hours, emphasising the point that a love of cars and driving is very different from the experience of commuting and congestion. Nonetheless, there must be *acceptable* alternatives to using the car. The preference for train travel - in effect, cutting through congestion - was striking throughout interviews across neighbourhoods, as was the failure of recreational cycling to translate into a functional alternative due to concerns centre around the issue of safety. Walking also is a recreational activity, associated with free time and use of local parks. Curiously, the LoUrb participant who seemed most highly motivated towards making more sustainable choices remained the least likely of this sample to substitute short or city-centre journeys with another mode. One potential explanatory factor in this behaviour might be complex travel requirements, necessitating interchanges on public transport journeys. Another either auxiliary or competing explanation might be the status of car-use as a social norm, a phenomenon also present in the second low-density research neighbourhood.

7.6.2 Central

The contributions of the Central participants in particular demonstrate that a strong sense of identity as a driver and even a passion for cars can be compatible with living a largely car-free lifestyle. Notably, the three current drivers in this area were highly multi-modal, using the car when other modes incurred relatively high costs in time or inconvenience due to an interchange of mode or vehicles being necessary. However, it is a function of the *density* as much as of the centrality of the neighbourhood that parking is highly constrained and both current and potential drivers

remark on this as an inconvenience. Three of the participants offered striking examples of changing travel behaviour regarding their car ownership and use associated with making the move to Central: consistently buying and selling vehicles depending upon location within the city; shifting from two large high-performance cars to one small vehicle; and in one case actually forgetting about a car because it was used so infrequently. Walking as a mode of travel emerged as a theme within the narratives as well as from the semi-structured interviews and was in some cases explicitly positioned against reduced levels of car use. This was a feature of both current and potential driver interviews. The willingness of participants to hire a vehicle for recreational trips outside of the city similarly indicates a lack of distinction in travel behaviours between the two groups.

7.6.3 Peripheral

The travel behaviour of the peripheral participants could be distinguished from those in the low-density urban area in three respects. Despite greater distance from the urban core, the research protocol generated contact with three potential drivers in the Peripheral neighbourhood, albeit a relatively homogenous group in that they were all female, over forty-five and living as part of a couple. Consequently, both as a group and considering only current drivers, the Peripheral participants showed a greater range of multi-modal behaviour than the LoUrb dwellers, including the use of train and bus travel on leisure trips. Thirdly, that the Peripheral participants make greater use of local amenities was a major differentiating factor between the two low-density environments, to some degree normalising walking as a functional activity in the Peripheral neighbourhood. Nonetheless, with the exception of the cyclist, participants classified as potential drivers experienced comparative isolation and, in one case, regret because of their travel choices. In contrast with the Central group, current and potential drivers here were strongly polarised.

In the face of both domestic and wider social pressure, the potential drivers in this area remained categorically *non-drivers*. Nonetheless, although the current drivers in this low-density area were less conservative in their travel choices, even with frequent and inexpensive alternatives, the examples of how modal choice is rationalised demonstrate that it takes very little to tip the balance back to driving.

7.6.4 HiUrb

This rationalisation process is also seen to some extent in the regular car commuters in the high-density urban area. Where there is personal car ownership for each adult in the household, driving remains a default option; however, where there is shared ownership or the household includes another adult who is not a regular driver, modal choice is more open. Where LoUrb can be understood as having a culture of car dependence, in the HiUrb sample there is a predominance of driver-behaviour involving borrowing, sharing and hiring cars. In common with the Central neighbourhood, the HiUrb participants associate these lower levels of car dependence are associated with higher levels of functional walking. As a modal choice, this is connected with using local amenities, accessing other transport options given the good connectivity beyond the neighbourhood and simply enjoying a walkable environment. Within both high-density areas, the phenomenon of reappraising need in the light of positive non-driving experiences was apparent. Like the Central neighbourhood, the predominance of multi-modal behaviour in HiUrb coincides with constrained parking space, a neighbourhood feature which is again commented on negatively by residents. However, both high-density environments also shared in the phenomenon of participants reappraising their need for car-travel in the light of positive non-driving experiences. Although train travel is still preferred for speed and reliability, there are also some positive responses to bus travel where it goes directly to the destination desired.

7.7 Conclusions

Chapter 7 has examined the research evidence from the perspective of the potential spatial impacts of density and centrality on travel behaviour, with a particular focus on car use. Using accounts from participants in four case study neighbourhoods that are, as far as is possible, comparable other than in terms of density and centrality, the interplay between the behaviour and attitudes of the different urban dwellers to transport and travel and the structural impacts of urban form has been considered following a case-study structure.

The evidence suggests that spatial factors dominate over the attitudinal. A number of participants displayed strong (positive and negative) emotional engagement in speaking of cars and driving that was, to a striking extent, not congruent with their behaviour. With more pronounced effects in the Central area, the accessibility that accompanies urban density was shown to increase walking as a mode of transport for trips with both social and economic purposes carried out locally. In the case of the Central area, economically-orientated trips tended to be for work purposes when using other modes would be in some way inconvenient (e.g. interchanges because one service did not cover the whole journey or a need to trip-chain multiple destinations). Conversely, in the low -density neighbourhoods, the car was the default mode with public transport being used for work journeys when it offered competitive speed because of congestion. Participants from different locations also expressed great sensitivity to charges associated with car ownership and use. These patterns of behaviour occurred without regard to the attitudes of the participants to cars and driving.

Reinforcing this point, several life histories reflected a pattern of modal choice and car ownership changing with urban location (see Alistair, Barbara and Brandon). Furthermore, high-density residents were shown to

be more multi-modal, with both current and potential drivers from these areas showing a pattern of sharing, borrowing or hiring vehicles as needed. Parking constraints discouraged both ownership and use: travel and modal decisions were made around the difficulty of securing a parking place.

Overall, Chapter 7 has demonstrated that research participants in the two high-density neighbourhoods exhibited more flexible travel behaviours in that, for them, the car appeared as one of a number of modal options rather than as the default choice. Furthermore, the findings from the previous chapter supported the concept of an opposition between walking and driving where the habitual selection of one mode is at the expense of the other. Taken in tandem, these two factors suggested that a combination of density and mixed-use do support lower levels of car ownership and use. However, the value of these findings is limited without developing some understanding of what the participants do or do not find attractive about the neighbourhoods they have chosen. As has been shown, a number of the research participants made reference to their past travel behaviours, exploring examples of different travel behaviour in each area raises the topic of locational choice. The interrelationships between mobility and place are more fully developed in Chapter 8, which uses the narrative component of the interviews to take a more longitudinal perspective. Broader questions, theorising the qualitative and quantitative findings in relation to conceptions of social inclusion, are dealt with in Chapter 9.

8 Travel Choices and Place

8.1 Introduction

The narrative format of the interviews affords a longitudinal perspective on the residential choices of participants, allowing insights into the significance of car transport and accessibility in different environments. Considering the relative affluence of the participants and that they have *chosen* to live where they do, this chapter explores themes that emerged from the accounts, making inferences about residential choice, mobility and experiences of inclusion/ exclusion. The core theme is that of place, and the chapter addresses the importance of place to explore *why* the participants have made the locational choices that they have, considering the implications that those choices have for transport use.

The opening section of the chapter introduces the theme of Choosing Density, which draws on data where participants have discussed what attracted them to their current neighbourhood. This theme is developed further into a section on Urban Living, which explores the qualitative implications of mobility in more dense neighbourhoods. The third section of the chapter, An Urban Future?, questions the sustainability of dense urban communities across the life cycle, asking whether moving on always means moving out before offering conclusions on the four themes listed above. For ease of cross-referencing, where there quotations, the participant's age band and neighbourhood will be noted alongside their pseudonym.

8.2 Choosing Density

Two clear themes emerged from the narratives with regard to locational choice. The first of these, concerning residence and identity, applied across

the participants; the second theme, which centred on residence and relationships, manifested differently in the high- and low-density areas.

8.2.1 Residence and Identity

Life in the current neighbourhood was understood in terms of comparison and contrast with previous residences, with participants defining themselves in terms of belonging and where they were from:

I wouldn't like to stay...if I ever moved again, I wouldn't like to stay in the suburb, or further out, 'cos I don't belong to Glasgow, so I like the proximity to the city centre and all the facilities round about. I actually belong to Roxburgh and West Lothian.
(Brenda, HiUrb, 55-64)

Change of residence was referred to at multiple levels: choosing the city; choosing the neighbourhood and choosing the property. As well as “explaining” choice of residence, identity also emerged as an important element in decisions about moving home, making the presence of some affective component in locational choice ubiquitous. Only one participant asserted a *single* reason for her choice of home. However, whilst emphatically stating that her only reason for living in Glasgow was work-related, she also related considerable supporting history about other cities she had moved to, how those moves had furthered her career and, in doing this, constructed an identity as someone high-achieving and very career-focused (Amy, Central, 45-55).

The multi-layered experience of choosing density was typified by a couple who moved to a modern apartment in the city centre just over a year ago from a detached property in a town within commuting distance from Glasgow. The narrative introduced their new home in contexts concerned with proximity to their city-centre business and mentioned in passing that there had been some discussion of moving into the city later in life; at another point the inconvenience of having a social life geographically

centred far from home was outlined. However, the explicit framing of their reason for moving is given in terms of an impulse purchase:

... And this was done, believe me, on the spur of the moment! We talked about it and somebody said to Ewan [her husband] 'there's fabulous flats going up over there'. We were in getting a delivery [at work] on a Wednesday afternoon and I said, 'Oh, we'll go down and have a look at these!' And we do things like that, by the way.... and Ewan said 'you know I think we should just buy...' and that and I thought 'oh!' [laughs] ...and that was it, it was done. It was done and dusted very quickly, and I think if we'd stopped and thought about it, it might not have been done and dusted very quickly! (Abigail, Central, 55-64)

Although the choice of Central urban living had the benefits of proximity to work and convenience of access for social purposes, a sense of excitement about the property dominated pragmatic considerations. Even where the main theme in neighbourhood selection was as apparently straightforward as access to amenities or investment value, some affective component was also present. The emergent theme of residence and identity demonstrated the key role of affective factors in locational choice.

8.2.2 Residence and Relationships

Identity was constructed in terms of relationships with people as well as through relationship to place. With the caveat that, in the case of the Peripheral area, the quality of local schools was regularly discussed as a powerful attraction of place, the theme of residence and relationships distinguished the high-density narratives from those of the low-density participants in the act of choosing density. For both city-level and neighbourhood-level moves to low-density areas, family history or an existing family network were integral to the appeal of the neighbourhood. In some cases, these connections were functional - giving support to an elderly relative or childminding for those with younger families. However these networks also fulfilled a social value, as a leisure-time focus.

Incomers and participants familiar with the city alike considered distance from the urban centre without supporting family relationships to be undesirable. One previous Peripheral dweller connected suburban location with a feeling of isolation, suggesting concern with lack of contact rather than lack of access to amenities:

Interviewer: How would you feel about moving out to the edge of the city again?

Barbara: I wouldn't dream of it! [shakes her head] I wouldn't dream of it because it's too far away from the city, I'd just feel so... I personally would feel isolated. I wouldn't like it, no, it wouldn't suit me. Because I've no family...and I don't need a garden...So I like to be n- close to the city. (Barbara, HiUrb, 45-54)

In one case, a couple, originally from the Western Isles, did move to the Peripheral area without a pre-existing family network. The narrative recounted neighbourhood selection as positioned positively by recommendation and negatively against preconceptions about urban life:

Well, I'm not a Glaswegian, I come from the Islands. I come from [Island A]. And my husband's from [Island B], so when we got married we were looking for somewhere that was kind of...not city because we are sort of country people as it were and we had friends who had actually moved to Peripheral because I didn't know about Peripheral, didn't really know much about the city really and coming from the Islands to the city was a bit of a culture shock. But ...and I knew I certainly wouldn't want to live in a high-rise or in the middle of Glasgow.. so friends of ours had actually got married and moved out to Peripheral and we liked Peripheral. (Carole, Peripheral, 55-64)

Nonetheless, although family relationships were the dominant deciding factor in the choice of low-density neighbourhood, even participants who had lived in Glasgow for many years exhibited surprising and sometimes dramatic shifts of register when recounting their experience of moving to an unknown area:

...crossing the river was a very traumatic experience for me...moved here and thought 'My God, What have I done?' (Claudia, Peripheral, 55-64)

The primary reasons [for choosing the neighbourhood] surrounded the cost and the make-up of the property itself, but also on top of that the knowledge that it wasn't hell on earth. I felt comfortable that I had enough background knowledge to know that it wasn't a bad area that I was moving to. Because I knew that I probably didn't know nearly as much about it then as I do know but I felt comfortable that it was a good area. (Blair, HiUrb, 35-44)

The dominance of family history and family networks in the low-density narratives was at one level a function of demographic composition at neighbourhood level. However, the narratives also showed the significance of affective as well as functional factors in neighbourhood selection. Contrasting the high- and low-density narratives suggests that the practical value of greater accessibility in high-density areas is paralleled by emotional value; even for participants familiar with the city, a house move to an area without some kind of personal network in place can be a highly charged experience and the accessibility of the more Central high-density neighbourhoods can function as a proxy where there is no pre-existing social network.

8.3 Urban Living

As with initial choice of residence, the recurrent concept from the theoretical literature on the city of ambivalence towards close contact was also present in the discourse of participants when their narratives related to the experience of urban living. However, despite common ground at the attitudinal level, high- and low-density participants had differing experiences and understandings of contact and community.

8.3.1 *Density and Contact*

Policy objectives notwithstanding, contact should not be assumed to be a good thing. One reminder of the more pessimistic strands of urbanist literature, which makes an appearance in the narratives of all participant groups, is the character of the interfering neighbour. However, outside of participants' discourse, this figure remained a mythical presence:

Charlotte: I mean I don't like neighbours that are wanting to know your every move or you know, wanting to talk to you all the time, I've a low...It sounds terrible but hello and goodbye is ideal for me.

Interviewer: It sounds like you've maybe had the opposite experience somewhere?

Charlotte: No we've never had, *touch wood* somewhere...em...neighbours that really em... like the old-fashioned sort of tenement-type neighbour that knew all of your business. (Charlotte, *Peripheral*, 45-54)

The desire for a private home space was not the preserve of either high- or low-density participants and there were participants in both high-density areas who did not identify with the image of a gregarious urban type. However, communal entrances made contact with neighbours a notable theme of the high-density narratives. For the most part, the participants were positive about these regular contacts. Whether or not high-density participants adopted an outgoing 'urban' lifestyle seemed to be a function of personal choice - or perhaps of personality:

In terms of em developing new friends it comes of a consequence of em, just wanting to get to know people in your day-to-day business, I mean if you were to sort of analyse it you would see the further we get from our front door the fewer people we know, em but it's certainly been my experience in the current flat that we stay in and in the previous place that we stayed in, you get to know everybody in your block. and em very probably adjacent block and thereabouts as well so you actually end up knowing quite a few people. (Blair, *HiUrb*, 35-44)

Eric and Edward know everyone and they know who lives in the building and they seem to see people. I never seem to see anyone. I always go 'how do you know them?' 'Because they live in the building' and I go 'well I've never seen them before!' So I don't know whether I sort of do that [mimes wearing blinkers] and they go "Ah...ah!" [mimes looking around and waving] (Alison, Central, 45-54)

However, although for practical purposes there was no tension between high-density living, in even the city centre, and having a domestically orientated lifestyle, cultural expectations of what the urban lifestyle should be like are pervasive:

I've got the option to do lots of things if you want to...and at the same time if you've got your own flat you can close the door if you don't want to...you can close the curtains, put the TV on if that's what you like. You don't have to go out all the time. But I'm quite a home bod. Which, a lot of people think is ...a bit 'why do you live in this area if you're such a home bod?'... But I keep saying this - I like it for its location as well as for what it's got to offer. I like the fact that if you do fancy...if you are meeting friends or you'd like to go out you don't have to think about it. They're more than happy to meet you in this area here. My social life - it's not...I'm quite contented but it's not as extensive as a lot of people.(Arthur, Central, 25-34)

Although the reality that being a 'home bod' is quite compatible with enjoying city centre life, this stands in contradiction to a cultural norm represented above by 'a lot of people' and the participant's need to 'keep' asserting that he enjoys the location of his neighbourhood. The language is hesitant and almost an apology for insufficiently social behaviour, betraying implicit normative assumptions about how much contact people ought to have with their neighbours.

Contact with neighbours was generated by the density of the wider urban area as well as by the structure of the properties. Cars and motorbikes can be seen as modes which minimise neighbourhood contact: they are point-to-point transport, often involving no contact with fellow travellers; the speed of the vehicles makes it unlikely that the driver will stop driving to have a conversation; and the helmet or the body of the car provide encasing

structures, sealing off the driver from those outside. However, in high-density areas, the lack of private parking changed the social impact of the vehicles, as they were parked on the street. Comparing his current home to a previous low-density residence, one participant reflected:

...you talk to your neighbours when you're parking your car, more when you've just got out of your car. You're much closer to your neighbours...(Boris, HiUrb, 45-54)

This kind of light social contact can run cross-gender, cross-ethnicity and cross-generationally:

.. a lot of the kiddies are drawn to the bike as well. There was a lady, another Asian lady, she came over...and she wears the burka and stuff so you can never recognise them. One burka wearer's the same as another, apart from maybe extreme body shapes ...and she came up and said to me 'You know my son recognises the sound of your engine, and he says 'Honda! Honda!' So he came over and we were talking and his mother asked him 'do you want to sit on the bike?' Ooooh....he started to cry...he was too scared to sit on it [laughs]. It was quite nice...I said, 'when you're older, you can sit on it' (Brandon, HiUrb, 35-44)

Conversely, in low-density areas the car appeared as a major factor in limiting neighbourhood social contact:

Interviewer: Do people mix, the older residents and the younger families?

Claudia: I don't know, is the honest answer...I mean everybody drives, so even if they've got young kids, unless you're right near the house where the kids are playing when they go out they go out in the car usually, so you don't actually probably meet in the street an awful lot. I mean we've got young families either side of us. We do see them obviously because the gardens are joining, but, the other ones further down the road - don't often see them (Claudia, Peripheral, 55-64)

Although the difficulties of parking and the lack of a garage is bemoaned by several of the high-density car owners, nowhere do the narratives link this discontent to thoughts of changing property:

I'd rather have a place with a garage but, yeah...I like the area, I like the people. (Boris, HiUrb, 45-54)

Choosing density can be seen as choosing accessibility. However, in terms of identity and belonging, it is also an act of affiliation with or rejection of culturally informed assumptions about the urban and the suburban: in particular, associations between place and safety, maturity or community. Nonetheless, the narratives of contact in urban living indicate that there is a tension between perceptions of high-density living as involving enforced contact and the reality of light acquaintances which are valued by the high-density dwellers. The high-density participants seem to experience their environments as giving the option to make diverse contacts; even for the participants with relatively car-orientated lifestyles, constrained parking is contextualised by enjoyment of the neighbourhood.

8.3.2 *Density and Community*

Local amenities, especially shopping, have important roles in both high- and low-density areas. Most participants used local shops or eating/ drinking facilities to some extent. However, frequency of use and the meaning of those amenities varied by both density and car-user status. Although the low-density Peripheral area also has a “village” centre and the low-density urban area is adjacent to the high-density urban neighbourhood, it was in the high-density interviews that local amenities were associated with recognition and a sense of community:

You go up there [nods towards local shops], you get 'how's it going today, big man?' you know...you were lucky to get a [football team] win at the weekend' [laughs]. You know, you get that personal attention, just relationship, you know? (Brandon, HiUrb, 35-44)

A feeling of community was remarked on as something which was most satisfactory about living in the high-density areas and there was

considerable emphasis on and delight taken in even quite casual acquaintance and recognition:

But, you know, I walk about the street and see, you recognise a lot of the same faces... I was getting a train home from Stirling the other night and there's a guy that stays round the corner, he's got a dog and I thought, 'oh, that's the guy with the dog' [laughs]... and if you were asked you would probably recognise people and all that kind of thing so...you kind of know that if you go to certain things, you've got a rough idea who you probably expect to see. (Andrew, Central, 25-34)

Participants from low-density areas tended to drive to shops, sometimes for very local errands and, in the case of those who had a preference for not driving, talked about restricting their hours of travel when walking or taking public transport. Where high-density participants used a car for commuting, their shopping patterns were more visits alongside their regular travel to or from work, sometimes varying choice of supermarket according to either changing preferences or special offers; although they still used local shops occasionally, the latter were not an important resource and were seen as a stop-gap.

For the high-density participants, shopping locally and using local eating/drinking places was widespread and a normal, as opposed to an occasional, part of life. Furthermore, for the high-density dwellers, shops are not just shops - they are strongly associated with the concept of community:

They do very well, these shops. They're very varied in nature. Yes, they do to an extent serve...it's the kind of moneyed HiUrbians who like to go there for their morning cappuccinos and cakes, or evening meals - three restaurants open in the evening now there - em, but you get a sense of community there and it's a lively, vibrant community as well... There are no redundant shop spaces at all there, it's... it's thriving and it just feels nice to be there and typically on your route out you will meet somebody you know or just simply can give a nod to...I mean it's nice to go into a shop and be recognised, and be known. I might not know half of their names but em.. they know me, and I know them. And that's a nice thing to have, it really is. It's something that when you dwell upon moving elsewhere, perhaps somewhere more suburban you think well that's one of the things that I would lose,

and that's something that you.. perhaps would ponder (Blair, HiUrb, 34-45)

One Central dweller connects both density and amenities as attributes which underpin the sociable nature of his neighbourhood as he understands it:

But it is quite a sociable place. Probably because there's so many places to be sociable. So...I reckon it's a combination of who you know is: your neighbours, people who might move here because you know people who already live here, and you get introduced to people that way. Or you just see people out and about. (Arthur, Central, 25-34)

When it came to translating perceptions of community into practical action, participants from high- and low-density areas reported contrasting experiences of organising to meet an objective. Central participants recounted stories of co-operating with their neighbours and with local traders to improve their environment or negotiate over problems. High-density urban dwellers also talked about success in joining forces with their neighbours over a number of issues, although on some occasions this was a product of sharing common property. Speaking of a previous home in a low-density area, one high-density participant said:

Up there, people tended to keep themselves to themselves and...in HiUrb you can't [smiles for the first time in the interview]. We all know a plasterer, a joiner, a roofer... (Boris, HiUrb, 45-54)

The narrative format of the interviews also gave an insight into the challenges of mobilising people towards a shared goal, even in what might be considered a relatively community-minded area. A by-product of high-density living is that larger amounts of refuse are generated over a smaller area. In recounting environmental problems and a local solution, this narrative would seem to betoken an internal disconnect between enjoyment of and indignation about the need for community action:

I don't think we should have to clean it up, I think it should be cleaned up by the Council because we are paying an awful lot of money to Glasgow to do that kind of thing, but anyway...but when they do a cleanup day they get stalls set up at the park , and the bin lorries - the Council does get involved - and the bin lorries go around picking stuff up, and they give you black bags and gloves and litter tongs and stuff, and people just get out and muck in , get around and clean up the area, all sorts of people, all ages do that. And that's a really good thing to do, it's nice to see people actually come out and help. As it so happens the last two years they've been doing it I haven't done it, just because I've had something else...something else on on that day and haven't done it, but I have done it a couple of times and you know, it's quite good fun and then afterwards they have over at the local allotments they have a little after-cleanup...thing where you can go and have some food and drinks and one year they gave people who helped from the people in the allotment, and I don't know who else put into it, they gave hanging baskets to everyone who helped and then they came round and put them up outside the houses! (Bella, HiUrb, 25-34)

However, the examples of co-operation given by high-density participants stand in contrast to the experience of one Peripheral dweller who tried to organise a local environmental clean up; he describes printing leaflets proposing a date to clear rubbish from a local stream and hand-delivering them to every house in the area:

Do you know then number of responses I got? A big fat zero! That would be about 15-20 years ago, but...not...one. Which reflected to me the relative interest that people have in their immediate environment which I found kind of depressing. (Callum, Peripheral, 55-64)

As with the issue of neighbour contact, there is not a uniform enthusiasm for community activities in high density areas. One Central dweller was bemused by an area petition to close down a local chip shop and far more irritated by what she saw as community interference than any public nuisance concerns. Nonetheless, that was at an extreme end of the spectrum of reactions to community activity. It is possible to be both dismissive of local organisation and still be community-minded in practice:

There's a residents association and they run events two or three times a year. They do a, they sort of go round the streets at New Year, making a noise...

[...]

I'm quite happy. I'm quite happy for it to happen. It... good community spirit is generally good for the place, cos it cleans the place up a bit. That's one of the things that happens - they clean the place up, for it, but you tend to try and...well, our place it gets, it easily gets messy because of the putting the litter out in the back lanes for people to collect. Then you get a lot of fly tipping and such like, so you get a lot of rubbish blowing around. But on the other hand you also get a lot of weeds growing in the back lane but not too many where, in our back lane cos I go round and kill 'em. So that, that's more than just mine...I don't just do my bit. I do the whole kind of stretch...which means that litter tends to blow straight through! (Boris, HiUrb, 45-54)

Although, like contact, there are ambivalent attitudes towards community, as well as to the occasional necessity of taking community action, the sense of community tends to be highly valued and even quite trivial local contact tends to be associated with positive emotional reactions. Analysing the narratives in terms of choosing density and urban living reveals that what participants value about their neighbourhoods once they live there, as well as its anticipated benefits. In relation to the high-density neighbourhoods, the two emergent themes were of contact and community. Both themes raise questions about the concept of there being an urban type of some sort. The myth of the overbearing neighbour was as much a source of concern amongst high- and low-density dwellers. Similarly, both high-density areas housed participants who were contented long-term residents who considered themselves neither community-minded nor particularly sociable. The necessary contact occasioned by proximity both within properties and on the street was generally valued as, in practice, contact seemed to be an option offered by density which could be taken up or ignored depending upon personality and inclination. Although the constraints of density, such as the lack of private parking space, might be irritants, placed within the context of the whole neighbourhood experience they were relatively unimportant.

8.4 An Urban Future?

Thus far, emergent themes have focused on the attractions of relatively high-density environments and the benefits that urban living can bring. However, even for those who have chosen density, certain aspects of their neighbourhood experience raise questions about their future as urban dwellers.

8.4.1 *Density and Environment*

As might be anticipated, the dominant theme when it comes to the negative aspects of urban living was the role of the car. In both high-density areas, car owners and non-car owners alike devote time to discussing the challenges and charges involved in parking; some display an impressively detailed knowledge of restriction times and charges and strategies in and round their neighbourhoods. In the heavily built-up environment of the high-density urban neighbourhood, any argument that road capacity limits traffic was seen, albeit humorously, as a *lose-lose* scenario:

That...is kinda twofold, and it's bizarrely contradictory as well. You get a lot of complaints about double parking near the shops but equally you get a lot of complaints about speeding drivers round about the shops; well, other, other areas as well, it's the downside to having these wide open thoroughfares, there are some guys who'll drive about in their car and really put their foot down and go extremely fast. How much of a risk they are posing it's really hard to know but I mean it's the kind of thing that really does get people's backs up. But the bizarre thing that I'm saying about double parking and speeding is that usually one prevents the other. [smiling] People tend not to speed when they can see that there are several 4x4s queued up outside [the bakery]. (Blair, HiUrb, 35-44)

However, there were a range of concerns beyond the practicalities of securing space. Traffic is also raised as an issue for pedestrians. One central resident wearily described planning his routes when walking around the area, whilst a participant from the high-density urban area complains on the grounds of aesthetics and, almost as an afterthought, pollution:

Here traffic's quite bad. Ash Street is just lit up with cars end to end certain times of the day, you know. You come down the hill on Apple Street or down Alder Street off the motorway, its just non-stop, and obviously you know it'll take you a while to get across there. You know the heavy spots...It makes you think about what way you're walking as well. Cos you start thinking, ah, well... if you're going up such-and-such a way you're going to have to wait ages at this traffic lights... (Andrew, Central, 25-34)

well, it's visually not very nice, seeing all these cars. I mean round the park for instance that's another thing when I arrived - as I say, 2005 - all round that little square [a small local park] about one and a half sides of four sides was usually free late at night, at midnight and they would still be free in the morning. They're all gone now. They- they're all taken up with parking spaces. And that was nice not to have the cars all round the square. Em.. Beech Road is the same. And again there's only flats down one side, the other are houses, well now there's cars parked the whole length. So visually it's not nice and of course it's more pollution. (Barbara, HiUrb, 45-54)

Although the visual appeal of a neighbourhood might sound relatively trivial when compared to the danger of road accidents or pollution, the aesthetic aspects of the neighbourhood are a powerful and recurring theme for the high-density participants. The architecture of both old and new properties is described, sometimes passionately, as both an initial attraction of and an important aspect of living in the neighbourhood. Some participants were knowledgeable about the architects involved in building design for their property and in the neighbourhood. Many stated a preference in terms of old or new buildings; one central resident describes her new-build home affectionately as her 'ivory tower' (Abigail, Central, 55-64).

Greenspace functioned in a similar way to architecture as both an initial attraction to and a valued part of the urban experience. It was also an influence on how people moved around the city. One central resident compared the amount of greenspace unfavourably to her previous homes in another dense area of the city and a previous property in central Edinburgh, saying that she now walks less than she used to:

I probably walked a lot more in Edinburgh than I do here...you know, I walked from my house in Edinburgh to town more often, just because it was quite a pleasant walk. I mean, when I worked in Glasgow, [in another dense area] of Glasgow, I used to walk home from there as well...it probably wouldn't be quite such a pleasant walk, cos you're just walking down busy roads, whereas in Edinburgh you had the Meadows and so on. you could walk across them, it was probably a more pleasant walk, emmm... In Glasgow...we don't have that many...(Amy, Central, 45-54)

Even small patches of local greenspace were highly valued - if for complex reasons. Describing local objections to a proposed development, one participant used the language of battle as he spoke of repelling an anonymous “they”, who were responsible for the dual threat of losing greenspace and suffering increased parking challenges:

Brandon: I don't know if you noticed the 'save our parks' signs?

Interviewer: Yeah...?

Brandon: We've got one in the window there...there's quite a few others. I think the community rallied a wee bit...the planning application's to build on the corner, greenspace diagonally opposite - they're going to build a big block of flats there and further up on the corner of Birch Street, two of the green spaces that we have. Parking's really difficult round here , eh, it would have just got a lot worse if it had gone through...which wasn't such a big concern for me, the issue was more hacking down trees and just making it so...urban! [laughs]. It was nice having that space over there so...I think they've been defeated, so there was a concerted campaign to oppose it. (Brandon, HiUrb, 35-44)

8.4.2 Density and Life Stage

Although city centre living has attracted people of all ages, it has not attracted people with children. A dynamic of people moving out of the high-density areas, particularly the centre, is a common theme in the accounts. One central resident suggested that this might be a self-perpetuating situation:

And I think it's always going to be a slightly transient population 'cos it's not exactly good child-rearing community. But that

would depend on how many people actually have children.
(Alison, Central, 45-54)

The three environmental factors identified in the previous section - architecture, greenspace and traffic - were all at one point cited in relation to the value of the neighbourhood for children. For example, although one aspect of a preference for older buildings might be personal taste, traditional tenement properties also tend to have high ceilings and spacious rooms in comparison with modern developments, making them more suitable for family life:

Boris: There are flats where you can go out and you've got some kind of garden or green space but generally speaking, not closer to the city. We are, I don't see...I mean you can go and get a flat in the city but it's a city flat.

Interviewer: That doesn't appeal?

Boris: Umm, no. Good flats for yuppies. (Boris, HiUrb, 45-54)

I do question new builds that are going up especially in this area. They're not family-orientated anyway, so it doesn't suit us anyway. The level of this flat actually is very good for a family, it's all on one level, the bedrooms are through there and the kitchen...They're not, you know they're not *laid out*...the rooms are very small. I suppose there are good factors in that they're probably quite well-insulated and they probably have quite effective double glazing and central heating and things but eh... I've never - it's never appealed to me though, having a new place, a brand shiny new place, I've always preferred things that are older, that goes for everything actually, pretty much. (Bonnie, HiUrb, 35-44)

Similarly, although parks and urban greenspace were identified as something which gave a neighbourhood appeal in the first instance, for the balance that they added to the urban environment, they were also appreciated as spaces for children to play:

Again, it's something that didn't occur to me at the time, but subsequent to having children, it's fantastic that there are such great park facilities - whether it be small play-parks or larger parks, I can certainly point to at least three larger parks in the area which are certainly, well, maybe one's not within walking distance but two very large parks within walking distance that are just first class and just a great place to go, kids or no kids, in fact. And again, they are places that are, where you feel safe, that are attractive...just nice to walk in, see the trees, plants, flowers, etc. (Blair, HiUrb, 35-44)

One of the older participants had lived in the high-density urban area for all of the time that their daughter was growing up. However, in reminiscing about the area as a good place to bring up a child, she associated this idea with the comparative lack of traffic in the past. Her narrative connects both greenspace and low levels of traffic to freedom as a positive feature for children. Even then, she went on to mention the necessity of emphasising the danger of road vehicles to the local children:

It was a good place to bring up a child, it was a ground floor flat, we had a back green for freedom...we also had a little bit of frontage and the street then was very quiet, very few cars about then [laughing] I know, it's very different now! So, I think from that point of view there was a lot of freedom for the youngsters in the area, and we lived across the road from HiUrb Primary, the infant department was over there. In saying that, though, we had to be careful...there was a road which was cut off in the end but we kind of made the children aware of the dangers of the traffic, though it wasn't much then. (Brenda, HiUrb, 55-64)

Moving to the present day, another participant was confident that he spoke on behalf of fellow-residents when he stressed concerns about traffic and child safety in the area:

If you go round and canvass local opinion, in HiUrb as to what their main concerns are, they will probably yeah they might talk about especially [to the east of the neighbourhood], they might talk about anti-social behaviour but em, they will almost certainly mention road safety. (Blair, HiUrb, 35-44)

However, there is evidence that, as well as more tangible forces, cultural factors also drive locational choice. From one perspective, a move to the suburbs can be seen as a right of passage:

I'm trying to think if there was other factors for Beatrice [in moving to the suburbs]...I think time, to a certain extent, to have a proper house. I loved the flat. I was quite happy to stay there, but my wife was the driving force behind that. (Colin, Peripheral, 35-44)

From another perspective, even without children, there are cultural norms about what constitutes appropriate behaviour in a mature adult. Although for the most part very enthusiastic about his urban location and lifestyle, this central participant with previous experience of suburban living reflected:

But then I think the thing, 'Right, ok...well I've tried that, and I didn't like it'. But I was younger when I tried it, so now I'm a wee but older and, and maybe I would appreciate it more, but I still go out and I still socialise and...maybe too much at times...(Alistair, Central, 35-44)

Where there is a family to consider, the pressure to do what is perceived to be good for the children is also played out in terms of the equation of private space with safety. Below, the narrative demonstrates a tension between conventional narratives about children, gardens and safety and a rational perspective on actual danger. It also suggests the speaker's own position on the value of a conventional suburban home is equivocal. His first-person statements all favour staying in their current environment; that moving to a home with a private garden would be good for the children is something to which he would have to 'admit'. However, the 'serious' argument about private gardens and child safety is mocked, by invoking the caricature of the 'bogey man', downgrading the question of a garden for the children to a matter of convenience. Once this has been done, the narrative muses on what people do - on the scope for staying - as the first person voice returns, blending mockery and rationality to again undermine the case for moving house:

I mean I for one would have to admit that sooner or later having a stand-alone house with a garden would be great for the kids - personally I'm not hugely fussed myself but when you see how much kids enjoy things like that. You have to sort of take that on board and certainly for families em, who have kids in the area, the sort of shared back court has its advantages but there are some days where you wish you had something that's in closer proximity to your own property, etc. It's not really a sort of fear factor where you don't know what your kids are getting up to and you feel more secure, it's just a .. it's a convenience thing more than anything else, rather than em, living in terror of what's going on - 'is the bogey man out there'? Not at all!...it's more you would like to step out that back door and be in your garden, have it at your convenience. But em...people still stay [in HiUrb], they are... they still make use of it [the communal garden area] when the weather is good. And that's another calculation that you make, I mean how often would you get to make use of this fabled, wonderful back garden, given the weather conditions on the West Coast of Scotland? (Blair, HiUrb, 35-44)

8.4.3 *Moving On; Moving Out*

One objective of incorporating a biographical narrative component in the research design was to place an emphasis on revealed rather than stated preferences as the more robust basis for analytical generalisation. A striking finding was the degree to which participants genuinely had chosen density rather than seeing it as part of an interim life stage. Instances of dense-to-dense moves were common in participants' life histories; even where participants had children, high-density living could be something that was surrendered reluctantly. Revisiting an earlier quotation:

I'm trying to think if there was other factors for Beatrice [in moving to the suburbs]...I think time, to a certain extent, to have a proper house. I loved the flat. I was quite happy to stay there, but my wife was the driving force behind that. (Colin, Peripheral, 35-44)

Within the context of the whole narrative, the personal statements above mark an abrupt shift in register from an otherwise spare and factual account of why the family moved to their current home.

Although financial constraints were sometimes identified as compromising the selection of neighbourhood or property, this was almost exclusively within the context of making dense-to-dense moves. Trade-offs involved accepting more or less space in different high-density neighbourhoods rather involving frustrated ambitions of lower-density living:

I mean what is notable is the sort of transit route from [HiUrb 2] to HiUrb is quite tangible, I mean if my experience is not a solitary one and we, we have had an ever-growing number of friends who've done exactly the same thing. In fact I know someone who is moving this very weekend after staying in [HiUrb 2] twenty-plus years. He has bought property in the area so there's been a bit of a migration of friends. (Blair, HiUrb, 35-44)

Sometimes their level of attachment to high-density neighbourhoods seemed almost to surprise the participants themselves:

You know the boys? This hairdressers' just around the corner? They'd buy it [our flat] tomorrow. And Elaine [my daughter] said 'Would you sell it?' and...I don't think I would, funnily enough. No, I'm enjoying it too much. There you go! (Abigail, Central, 55-64)

So if I move I'll probably move, probably move outside Glasgow...but, I don't know where. I've got no connections to other areas really...when I was looking, the second time I was looking I looked all over [laughs], really, and then, I never found an area...I think I always found excuses not to move out of my area. And primarily it was because I know I'd miss the facilities I have on my doorstep. You know, people say you can go to [another high density area], you can get all these facilities, yes but...I don't know...there's just something that kept me where I am. I don't know why but...[laughs] well, that is why. [Decidedly]. Because of the facilities and the transport (Amy, Central, 45-54)

Given the relative affluence of the research participants, it is not altogether surprising that, for all its imperfections, they are living in the neighbourhood form of their choice; many expressed contentment with their homes and an intention to stay in the same neighbourhood. Where a move to the suburbs was mooted, it was either rejected as an unacceptable trade-off or contemplated as a not-particularly-desirable outcome of life stage constraints:

Boris: [...] I still would like a garden somewhere

Interviewer: Are you attached to the garden?

Boris: A bit. In some ways I would consider moving out [towards the suburbs] - I think I have to move out - we might decide to look for a bungalow or something, which would move us out

Interviewer: Would that be for more garden space?

Boris: No...that's to get rid of stairs, essentially. You want, part of the thinking, it will help my wife if we're living on a single level. And it helps as you get older to live on a single level (Boris, HiUrb, 45-54)

As the above examples demonstrate, participants themselves often made statements about future living preferences so, during the piloting process a question about the direction of anticipated future moves was added to the semi-structured interview schedule where the issue had not already been raised in the narratives. When high-density participants were asked to speculate about future moves, those who thought they might not continue high-density living had a preference for a rural environment:

I sort of dream of having two homes - one in the middle and one near a body of water...and I sort of vaguely have a bottom drawer, which is filled with things, to go in the second house. (Alison, Central, 45-54)

...we've been humming and hawing about staying or going cos we both fancy living in the country as well...its something we've always said we'll do ...we were pretty determined to do it and then ... [my partner] has, probably more so than me, although we both enjoy it, the kook-so-wan, the martial art, she's very good at it ...very flexible and she's, she's... just good at it. So that's [laughs], affected the decision to move to the country...you could still, but though the country , you've got all your problems moving in and out of the city, it would be much more difficult to go to the classes from there. So

that's been shelved for ... the foreseeable future and it's then a case of whether we would stay here, or go. (Brandon, HiUrb, 35-44)

Notably, this is not simply a romanticised notion of country life; both of these participants have previously lived in rural environments. Mythologising tends to take place during the course of imagining the suburban:

I think because I'm not in a full-time job I am here the whole time so I wouldn't for instance I'd hate to be stuck in the middle of a huge housing estate, a soulless housing estate with thinking "Oh my God what am I going to do today?" (Bonnie, HiUrb, 35-44)

When asked directly if they had considered moving towards a more suburban location, the high-density participants are quick to invoke narratives of local amenities and community in rejecting the idea:

I'd just hate to be dependent on a car. I've got a friend living down south in [large town], at the edge of where it's developed and they're dependent upon the car to do anything. You have to drive to, to get shopping. If I want anything I just...well, I'd hate to be like that. It would have to be the kind of set up like where there's some social life about it [...] where there's restaurants, shops and so on. That kind of environment. Not just a shopping centre, not housing that you have to drive - you always need some kind of public transport from the place. (Amy, Central, 45-54)

I did think at some point I would maybe move back to [other high-density area]. It's just cos I like it there. I do like it cos they're separate areas both with their unique sort of advantages and I think they are both areas where there is a sort of community type thing, you know? (Andrew, Central, 25-34)

Arthur's driving patterns have changed in that for his current work, unlike some of his previous jobs, extensive driving is occasional rather than the regular commuting to other locations in Scotland. Although sanguine about the necessity to travel for work in the past - "It's not the most difficult thing in the world - loads of people do it" - the experience of living near work has changed his priorities in choosing a home:

Walking to work increases your quality of life more than having to get in the car and join the commute or rush and get the train. So these are... it is a quality of life thing and it would influence me. When I get another job I would like to live near my work even if that wasn't in Glasgow - if it was in a different city or a different part of the country, I would still like to live near my work. (Arthur, Central, 25-34)

8.5 Discussion

The 'prompt' question for the narrative was temporally bounded and asked specifically for a life history *since the interviewee had moved to their current neighbourhood* (see section 6.5). Despite being directed to a contemporary time-frame, participants consistently drew from past histories and sometimes projected into the future as an integral aspect of communicating their current experience. Participants understood where they live as an important part of how they felt about their lives and, in choosing a complex bundle of neighbourhood or property attributes, also located who they are in terms of both where they are, and where they have been. Locational choice was complex and multi-layered and, as such, it was extremely unusual for a participant to identify only one reason for their choice of home. However, this link between residential choices and sense of identity was common to participants across different locations.

Life-stage factors, such as selecting a school, came across as important to choosing a neighbourhood (particularly within the low-density areas). However, the importance of relationships with people as well as place also recurred as a theme in relations to locational choice. This theme manifested differently across high- and low-density neighbourhoods: family relationships were the dominant deciding factor in the choice of low-density neighbourhood; for those new to the city, an attraction to the accessibility and social contact offered by the higher-density neighbourhoods seemed to proxy this social embeddedness in the absence a pre-existing network.

High- and low-density dwellers seemed to share some common (negative) attitudes towards urban living. Cultural hostility to the idea of density and

urban living (see Section 3.4.2) was manifested through implicit normative assumptions about how much contact people *ought* to have with their neighbours, and the appearance of the ‘interfering neighbour’ in some accounts. However, several accounts indicated a disjunction between these concerns and the actuality of high-density living. The high-density participants generally experienced their environments as giving an *option* to make diverse contacts. Furthermore, within the high-density narratives, casual contact within the local neighbourhood was associated with recognition and a sense of community. The relative success of high-density dwellers in mobilising over shared concerns might be considered as a positive position on a dimension of civic inclusion⁴⁹.

There were high-density participants who spoke of being fundamentally private or even anti-social people who nevertheless enjoyed local recognition, contact and relationships. Indeed, an important aspect of these benefits, which were sometimes construed in terms of community, seemed to be that residents could take them or leave them. As such, the recognition, contact and sense of community arising from the high-density urban interactions described by participants have a status more reminiscent of Sen’s conception of capabilities (see 2.4.4). On the basis of the findings here, the positive aspects of urban living might be considered in terms of ‘inclusionary effects’ rather than in the sense of a dimension. The following from Chapter 7 and 8 have been identified as inclusionary effects associated with neighbourhood by high-density dwellers:

- Increased active travel for both instrumental and leisure purposes
- Increased exercise due to buying more shopping locally when on foot
- Wellbeing associated with increased exercise and sense of achievement

⁴⁹ Note that *from their perspectives* having to deal with these issues – or the fact of being expected to act collectively - is not necessarily a source of satisfaction.

- Pleasure in familiarity with the neighbourhood and other inhabitants
- Pleasure in receiving recognition and social exchanges with other inhabitants (including shopkeepers)
- Positive sense of community
- Attachment to place

Again, considering the accounts in terms of possible inclusion/ exclusions, the environmental impacts of traffic were a concern, especially with regard to children. However, within the ‘bundle’ (Storper and Manville, 2006) of high-density choice the evidence here suggested that positive attraction to aspects of their urban environments outweighed these negatives. This aligns with Senior *et al.*’s findings that, despite expressed preferences for an ideal of detached/ semi-detached properties with a garden, city centre and dockland areas were considered an acceptable alternative (2006). Most specifically participants in this research valued the quality of property with regard to size of rooms, access to pleasant greenspace and perceptions of architectural merit recurred. As with the Bretherton and Pleace (2008) study, density *per se* need not be a problem. Equally, although car access in terms of both ownership and use was constrained, the benefits of living in the area were perceived as outweighing the disadvantages.

Complementing the longitudinal dimension of the narratives, the question of whether the participant would consider living in a different urban or rural environment was woven into the interviews if the topic was not brought up spontaneously. Both temporal perspectives provided examples of participants making dense-to-dense and suburban-to-dense moves. Surprisingly, some high-density dwellers seemed move between rural and high-density environments, eschewing the suburban completely. Overall, these findings suggest that an attractive high-density environment (in the cases studied complemented by local shops/ leisure amenities and good

access to greenspace) can confound cultural expectations of which high-density living entails.

Reflecting on the inductive qualitative analysis in relation to the quantitative phase of the research, two further findings are merit comment at this point. Firstly, only four of the research participants mentioned activities which were coded under the heading of '*civic engagement - formal*' during the analytical process. These activities were: attending meetings of the local community council; contacting an MP about street lighting; and having membership of the Glasgow Chamber of Commerce. Although coded, this information was of peripheral status within the individual narratives and themes relating to either neighbourhood or mobility within the context of formal civic inclusion could not be adequately grounded. Furthermore, the latter two activities would have fallen outside the Burchardt *et al.* formulation (*ibid*) of civic inclusion; the status of *attending* community council meetings in this regard is also questionable. This finding tends to validate the idea that the quantitative definition of *civic inclusion* was too tightly bounded. Beyond this observation, any conclusions drawn about urban mobility and civic inclusion on such thin evidence would merely be speculative, other than to comment that the concept was not a strong feature of the narratives.

In contrast, social interaction proved a powerful strand within the accounts (see Section 8.5). The Burchardt *et al.* conception of *social interaction inclusion* as having access to emotional support from close friends or relatives might be considered as being implicit in some of the findings (see Section 8.2.2, Residence and Relationships); however, in accord with the quantitative findings, this formulation of *social interaction* did not make an explicit appearance in the narratives.

In contrast to the quantitative formulation, the dominant emergent themes relating to inclusion and social interaction in the second phase of the research were connected with the enjoyment/ usefulness of light social ties and a sense of community formed through neighbourhood contact. Indeed a

provisional coding formulation of '*civic engagement - informal*' was later subsumed into the category of community, in that the participants' narrative focus was a sense of solidarity (or otherwise) with others in the neighbourhood, rather than the object of the informal civic interaction. Indeed, the fact of *requiring* to take some kind of collective action can be resented at the same time as the sense of community resulting from a collective endeavour is enjoyed (as demonstrated by the trajectory of Bella's account in Section 8.3.2). Social interaction inclusion in these forms was associated with higher densities and walking or the use of public transport rather than driving. This, again, would suggest that different quantitative formulations of social interaction inclusion might produce correlations with car ownership where the operationalisation of social inclusion used in Phase One did not.

8.6 Conclusion

Chapter 8 has served to contextualise the preceding chapter by developing emergent themes which offer an insight into the complex inter-relation of transport, mobility and accessibility within locational choice. Recalling the definition of sustainable communities as "places where people want to live and will continue to want to live" (ODPM, 2003, p.5), evidence has been suggested for both the features and the processes which make high-density attractive. Affective factors, relating to personal identity and relationships were shown to play a powerful role in locational choice. Accessibility, especially as a product of urban centrality, was also theorised as being particularly attractive in the absence of family and social networks. Accessibility, along with a pleasant urban environment and spacious, desirable properties, was a key initial attraction of the higher-density neighbourhoods. Mobility was implicated in the accounts in terms of *how* place was experienced; walking, shopping locally and even exchanges over on-street parking were associated with recognition, contact and ultimately a sense of community and attachment to place. For some high-density dwellers, contact and community (though not explicitly anticipated at the

'choosing' stage) became part of what they valued about their neighbourhoods, finding that social contact was to a great extent an option rather than a necessity of dense urban life.

9 Conclusions

9.1 Introduction

This thesis has examined social inclusion as it relates to car ownership and use, within an urban context. The sequential mixed-methods research design allowed social inclusion to be conceptualised from divergent perspectives, which could loosely be termed objective and subjective. The first phase of the analysis applied a concept of social inclusion, quantified on four dimensions, in order to gain understanding of the relationships between car ownership, demographic variables, spatial scale and social inclusion. The second phase adopted inductive methods to identify how changes in urban environment might influence mobility and either or negatively impact upon participation in society.

This chapter begins with a review of the aims and subsidiary objectives that the thesis set out to achieve. The following section summarises the main findings of both the quantitative and qualitative analyses and evaluates the extent to which the objectives of the research were fulfilled. Thereafter, the key findings from the research are related to the overall aims of the thesis. Finally, some policy implications from the research are considered and overall conclusions are offered on the scope for social inclusion and the urban renaissance without the car.

9.2 Review of Research Aims, Objectives and Activities

The overarching aim of the research was to evaluate the extent to which an urban renaissance might reduce levels of car ownership without inhibiting social inclusion. Further to the overarching aim, the research also aims to assess the potential for de-coupling rising family incomes from increasing levels of car ownership and use, and ultimately, to identify robust strategies

for reducing levels of car ownership and use without inhibiting social inclusion. The specific objectives set in order to fulfil that aim were:

Objective 1: To analyse how levels of car ownership relate to key dimensions of social inclusion and any intervening role of spatial scale in relation to car ownership and those different dimensions of social inclusion.

Objective 2: To theorise the mechanisms through which built form impacts upon car ownership and use by exploring the experiences of, and attitudes towards urban travel held by both driving and non-driving urban dwellers.

Objective 3: To investigate how these travel choices might relate to urban dwellers' perceptions of social inclusion or exclusion.

A sequential mixed methods research design was devised. Working within a post-humanist methodological framework, a mixed methods research design was considered fit for purpose and conducted in two phases for the following reasons:

1. Mixing quantitative and qualitative approaches offers scope for understanding social inclusion and the car from both objective and subjective perspectives.
2. Quantitative data allows car ownership to be analysed in relation to established indicators of inclusion/ exclusion; qualitative analysis can then extend these findings by examining car *use*, as well as ownership, and the full range of potential travel choices *in situ*.
3. Quantitative methods provided a robust sampling frame for the qualitative study, focusing on dimensions of inclusion and research populations that were demonstrably relevant to the issue of social inclusion and car ownership/use.

4. Qualitative methods also played a role in explaining the statistical findings of the research.

After reviewing the theoretical and empirical context of the objectives, more detailed research questions were developed.

Phase One: Quantitative analysis

Quantitative research questions designed in furtherance of Objective One were:

1. What are the relative impacts of social inclusion indicators, demographic risk factors and spatial factors in modelling car ownership?
2. How do spatial scale variables and demographic risk factors advance our understanding of the relationships between household car ownership and social inclusion?

Specifically, the analysis tested the hypotheses that:

- a) All dimensions of social inclusion tested will be (positively) correlated with levels of household car ownership.
- b) All dimensions of social inclusion tested will act as (positive) predictors of car ownership.
- c) In multivariate analysis, larger urban settlements and greater urban density will have a (negative) statistically significant relationship on level of household car ownership whilst controlling for social inclusion indicators.

Based on a review of empirical literature, indicators of social inclusion/exclusion relevant to car ownership and use were identified. An appropriate dataset for testing the relationships between social inclusion, car ownership

and other socio-demographic variables was compiled. The dataset was built by merging data from household, individual and economic datasets from wave *m* of the BHPS with additional spatial data⁵⁰. After cleaning the dataset, appropriate dummy variables were generated. These included an operationalisation of social inclusion indicators following the Burchardt *et al.* (2002) analysis of social exclusion and an urban/rural indicator derived from Experian's Mosaic data. Bivariate and multivariate analyses of the relationships of social inclusion indicators, social exclusion risk factors and spatial variables to the level of household car ownership in the UK were conducted, including diagnostic testing as appropriate.

Findings relating to the direction, strength and significance of bivariate and multivariate relationships of the independent variables to levels of household car ownership successfully addressed Objective 1 and were used to inform the qualitative phase of the inquiry.

Phase Two: Qualitative analysis

Following the sequential strategy of the research design a sampling frame for the qualitative research was developed on the basis of the quantitative analysis. Due to the significance of urban form, as demonstrated by spatial variables proxying density and centrality, a case study approach, comparing accounts from people in neighbourhoods of contrasting density and centrality within a large urban network was decided upon. Statistical analysis also demonstrated that, of the indicators tested, only income inclusion could be used to predict level of car ownership with confidence. In order to progress the research aims, it was decided that a relatively affluent population should provide a focus for the quantitative inquiry. Affluent households in case study neighbourhoods of contrasting built form were therefore determined to provide the most effective means of evaluating the extent to which an urban renaissance might reduce levels of car ownership without inhibiting social inclusion and therefore of assessing the potential

⁵⁰ Grateful thanks are due to Prof. Buck of ISER, along with Prof. Pryce, Experian and Hometrack for permissions and access to data.

for de-coupling rising family incomes from increasing levels of car ownership and use.

The selection of research methods suitable to interrogate the qualitative research questions was informed by the quantitative results, the review of theoretical and empirical literatures and the experience of the researcher (see Section 6.7). Both theoretical and empirical literatures provided evidence that car ownership and use could be highly emotive subjects. This was confirmed by the researcher's experience of presenting interim work both at conferences and in less formal settings. Therefore, assessment of the range of potential research instruments focused on methods geared towards more inductive techniques, in order to minimise participant assumptions about the focus of the research. Theoretical contention over the selection and interpretation of different dimensions of inclusion, combined with the lack of statistically significant relationship between level of car ownership and other inclusion indicators, once income inclusion had been controlled for, prompted a concern with confirmation bias brought about by imposing yet another inclusion framework on the qualitative research.

A hybrid interview form drawing from Wengraf (2001) was designed to combine narrative and semi-structured approaches. The narrative component of the interview was based on a SQUIN, asking for biographical detail of the research participant's life within their current neighbourhood, whilst the semi-structured follow-on allowed the interviewer to prompt discussion or further probe the role of travel and transport in the life of the participant. This oblique approach also had the virtue of embedding uncontaminated data about travel choices within the life of the participant and the geography of the city (as opposed to soliciting opinion about what ought to be the case). Simultaneously, the role of transport and travel in facilitating social inclusion (as participation) could be theorised inductively without imposing a framework. By definition, the nature of narrative interview also allowed some longitudinal insights into the role of the car over the life course of the participant.

Having identified an appropriate research design, the interview schedule and supporting materials were devised. Ethical approval was sought and received and a total of 6 pilot interviews were undertaken. Small modifications were made to the interview schedule and the working title of the project on the basis of the piloting process. Using SIMD and census data, target research neighbourhoods were identified and contacts developed in each area by drawing on networks of friends, family, colleagues and acquaintances. Using a snowballing technique, a total of 25 narrative/ semi-structured interviews were conducted, two of which were excluded from the analysis as they fell outwith the sampling frame. The interviews were transcribed and anonymised documents were analysed using NVivo qualitative data analysis software. Data were coded and themes of theoretical interest were developed inductively.

The qualitative phase successfully addressed Objectives 2 and 3. A case study approach, contextualising accounts from the research participants by neighbourhood and driver behaviour, used a comparison technique to examine areas of contrast and connection between current and potential drivers in each area. This process gave insight into the mechanisms through which built form impacts upon car ownership and use. Secondly, a thematic approach was used to analyse travel and transport alongside perceptions of social inclusion/ exclusion through the lens of residential choice in order to better assess the social sustainability of the urban renaissance in relation to transport and mobility.

Key quantitative and qualitative findings are reviewed here in turn, noting how each met the objectives set at the beginning of the research process.

9.3 Key Findings – Quantitative Analysis

Phase One of the empirical research was designed to fulfill Objective 1: to analyse how levels of car ownership relate to key dimensions of social inclusion and assess any intervening role of spatial scale in relation to car

ownership and those dimensions. Findings relating to car ownership and each of the inclusion indicators, followed by demographic and spatial influences, are summarised below.

9.3.1 *Income Inclusion and Car Ownership*

The predominance of income inclusion as a predictor of level of car ownership is double-edged. Considered in isolation, this relationship could be understood as substantiating the theoretical and empirical perspectives that endorse the idea that the car is a fundamentally desirable commodity and that, wherever possible, people will strive to own a private vehicle. This being the case, there is little scope for de-coupling rising family incomes from increasing car ownership and use: increasing levels of income will inexorably lead to increasing levels of car ownership. However, the preliminary bivariate analyses in combination with the multivariate analyses suggest alternative interpretations, outlined in the sections on civic and social interaction inclusion and spatial factors below.

9.3.2 *Production Inclusion and Car Ownership*

The production inclusion indicator, based on the work of Burchardt *et al.* (2002) was not coherent when tested as a predictor of level of household car ownership; bivariate analysis confirmed that, in disaggregated form, the variables of which the indicator was composed demonstrated both positive and negative correlations with the dependent variable. Other than providing an object lesson regarding the importance of verifying that the indicator truly represents that which it is intended to represent - in this case, the relationship between socially productive activities and level of car ownership - this finding confirms statistically significant transport disadvantage in terms of access to household car transport for the long-term sick and disabled. However, it also indicates a greater requirement for private car transport for the self-employed.

9.3.3 Civic Inclusion, Social Interaction Inclusion and the Car

Another interpretation of the *absence* of a statistically significant relationship between level of car ownership and the social interaction and civic engagement inclusion indicators (when controlling for income), is that it is possible to live an ‘included’ life along these dimensions without access to a household car. The evidence of only very weak bivariate links from the dependent variable, level of car ownership, to social interaction and civic engagement inclusion as operationalised here (Table 5.8) tends to support the idea that inclusion along these dimensions does not hold a statistically significant relationship to level of car ownership. Over and above the limitations of the quantitative research (Section 5.5.3) two caveats apply here. Firstly, although this evidence suggests that social interaction and civic engagement inclusion are not significantly related to level of car ownership, this does not imply that this is a satisfactory state of affairs for the households concerned. Furthermore, following criticism of models which have no mechanism for prioritising the different dimensions of inclusion which they operationalise (Leviats *et al.*, 2007), it does not imply that the social interaction and civic engagement as operationalised here are themselves considered important. These concerns are revisited under the key qualitative findings in Section 9.3.2 when transport and travel decisions are reviewed within the context of residential choice.

Finally, the fact that the final preferred model, which controlled for spatial scale in three tiers, did not demonstrate a significant relationship between the dependent variable and these two dimensions of inclusion could also be interpreted as a tentatively positive result in terms of evaluating the compact city hypothesis, insofar as there was no statistically significant association between either included or excluded status on either dimension.

9.3.4 The Demographic Risk Factors

Throughout the modelling sequences, the demographic risk factors performed in alignment with the existing evidence base in relation to the dependent variable (Section 1.2.2). However, within the context of the model series overview (Table 5.9), the models that attempted to understand level of household car ownership in terms of demographic risk factors performed nearly as well as the social inclusion models. The above findings in combination suggest that social *inclusion* (as operationalised with regard to this sample) is not a particularly useful framework for understanding car ownership, supporting theoretical critiques of the concept that demonstrate concern that the inclusion/ exclusion paradigm can act as a diversion from income poverty (Section 2.4.4.).

9.3.5 Spatial Factors and Car ownership

Despite the dominance of the income variables, a comparison of preferred models within the series confirms spatial factors as necessary to understanding levels of car ownership. Relatively dense housing (terraced or flats) has been confirmed as reducing the probable level of household car ownership even when controlling for income. The top tier spatial variables generated using Experian's Mosaic data and urbanisation index were calculated on an understanding of urbanisation that encompasses settlement size, centrality and peripherality; all were highly significant. However, of perhaps greater relevance to the compact city debate as it relates to travel choices, it was the lowest, rather than the middle tier of spatial variables that were finally retained in the preferred model, indicating that individual property type rather than the type dominant in the neighbourhood acts as the more effective predictor of level of household car ownership when controlling for income. It is possible that both tiers of variables can be considered as capturing distance to amenities and transport nodes but only the accommodation variable captures parking at the level of the household. This finding suggests for estimating level of

car ownership, private on-site parking matters more than the availability of space to park in the wider neighbourhood. This issue is revisited in the qualitative findings. Overall, the analysis of the role of spatial variables indicates that measures of both centrality and density are required to best predict levels of household car ownership.

9.3.6 Conclusions from the Quantitative Analysis

Evidence from the operationalisation of social inclusion as a predictor of level of household car ownership performed using this sample confirms income inclusion (as represented by net equivalised annual household income) was the key factor in understanding car ownership. Considering the car as the gold standard of mobility, the final preferred model indicates that households excluded on the income dimension, along with the households of the long term sick and disabled, are in effect suffering from transport disadvantage with regard to level of household car access. Furthermore, the households of the self-employed may be under additional strain because of the advantage conferred by access to car transport.

Nevertheless, the positive income-car ownership correlation is ameliorated by urban centrality, and by urban density at the very intimate level of accommodation type. This suggests that urban intensification through construction of terraced or flatted properties, particularly in larger urban settlements, would provide an effective means of reducing levels of household car ownership and potentially de-coupling rising family incomes from increasing levels of car ownership and use.

However, this argument cannot be made on the basis of this quantitative analysis alone. There is evidence that affective factors are important to understanding car ownership (Section 3.3). As these were not available within the dataset used for this analysis, it is possible that dense and central urban environments simply attract people who do not like to drive and that, rather than the urban form *per se*, explains the spatial findings. This proposition is further reinforced by Schwanen and Mokhtarian's

contention that there is an important element of self-selection in residential choice, where different personality types are attracted to different urban forms (2005). If this is indeed the case, improving income levels to the extent that affording car transport was no longer problematic would mean that the sizeable group ‘excluded’ on the consumption dimension, which has lower levels of car ownership and use because of poor income, would increase car purchase and travel levels in line with the currently ‘included’ population. Similarly problematic, although the quantitative phase successfully measured the impacts of density and centrality on household car ownership levels, they provided no information on how satisfactory these environments might be to the residents; it is possible that, rather than *choosing* an area with high accessibility where car ownership/use is less common, the locational selection is due to constraints. In this case, social sustainability has not been achieved: when people are able they will desert the city (Schoon, 2001) whilst lack of accommodation options in the private sector can force house price inflation. It was therefore important for further research on the ‘included’ mainstream to understand how and why spatial factors intervene in the income-car ownership relationship and any implications this may have for car use.

9.4 Key Findings - Qualitative Analysis

The qualitative phase was designed to build on the quantitative findings, in furtherance of Objectives 2 and 3 (see Section 9.2). Chapter 7 findings primarily focussed on the concern of: *Why might density, as evidenced in the statistical analysis, influence car ownership, use and alternative travel choices?* Chapter 8 addressed issues relating to: *How do car ownership and use relate to wider issues of social inclusion as evidenced in the statistical analysis?*

In accord with the quantitative findings, the second phase sampled from research participants who were ‘included’ on the consumption dimension

and did not otherwise take a prescriptive approach towards what might constitute an important dimension of participation. The remainder of this section develops findings presented in Chapters 7 and 8 to specifically address the two remaining research objectives.

9.4.1 Objective 2: *The Impact of Built Form On Car Ownership/Use*

Five themes emerged relating to the mechanisms through which built form impacted upon car ownership and use.

Theme 1: The effortless rationalisation of ‘need’

The lower-density areas showed a current driver/ potential driver distinction and a predominance of car travel. For participants in both of the non-dense environments, potential drivers - those who *could* drive and chose not to - were a rarity. Both of the case study areas had local shops and social venues; both offered a choice of frequent bus and train services into the city centre.

Although there were participants from the low-density areas who identified strongly as drivers, others expressed indifference to the car or declared ambitions to use options that they perceived as being healthier or more environmentally friendly. However, for the drivers, the car remained the default choice. Strangely, within this context, even the more enthusiastic drivers from the two low-density areas seemed to feel a need to rationalise their car ownership/use. For those who aspired to making smarter choices, very modest obstacles or wants (such as visiting a new location or the fact that it might rain) were used to explain the ‘need’ to drive on particular trips. There were a number of examples where the driver considered alternative options as in some ways more desirable. However, in practice, pressure of time, the opportunity to make multiple stops, and even the weather meant that the impetus to make smarter choices was easily rationalised away. To some extent this could be understood as a necessary

feature of lower densities, which generate greater demand for car travel by dispersing different urban functions. However, as described in Chapter 6, the area profiling process was designed to control for differences beyond density and centrality as far as possible; it should also be noted that every neighbourhood contained participants who worked away from the city as well as away from the local neighbourhood. Despite the availability of local amenities and other mobility options, within the low-density areas driving remained the default option, regardless of the centrality of the area. Where what might be termed *good intentions* only sporadically achieved modal shift, costs provided a more effective lever. Parking charges and congestion stimulated modal shift in dedicated and unenthusiastic drivers alike. This change was, it should be noted, also accompanied by considerable resentment.

Theme 2: Centrality and Radical Change

The question of how specifically density and centrality matter to transport choice also underpinned the contrasts and commonalities between case study areas discussed in the Chapter 7 findings. Centrality in particular, with the corollary benefits of high connectivity and good access to amenities, was shown to be a very powerful force influencing travel choices, in some cases precipitating radical changes in both ownership and use. The findings relating to changes in car ownership/ use support the idea of the car as a competitive mode, the use of which militates against other forms. Although one Central resident moved to the area for accessibility reasons, this was not associated with a dislike of driving - the issue was the time which congestion took out of his day.

Theme 3: Density and the Driver Default - Tipping Perceptions of 'Need' and Want

In both of the dense areas there were participants who actively enjoyed driving and who appreciated cars from an aesthetic perspective. Whilst accessibility was mentioned as featuring in locational choice, driving *per se*

was not a consideration in advance of moving to these areas. Households with two working adults sharing one car were a distinctive feature of the dense neighbourhoods, as was the idea that more than one car might be an inconvenience rather than an asset. The car-use of participants in high-density areas was generally centred around journeys which could not otherwise be carried out without considerable difficulty - in particular, journeys involving interchanges. Although neither increasing physical activity nor decreasing driving appeared to have been a motivation for selecting a relatively dense living environment, in contrast with the participants from low-density areas, the feature of rationalising a 'need' for their car use was absent from these interviews.

Theme 4: Residential Parking and Car Use

Participants from all areas discussed destination-point parking difficulties as a factor that made car use less attractive. However, residential parking appeared as a recurrent theme in accounts from participants from both of the high-density neighbourhoods. Participants associated constrained parking space with lowered levels of car ownership as well as lower car use. Although three of the central residents had access to private parking, there seemed to be an element of *out of sight, out of mind* in terms of their modal choices. In contrast, accounts from participants in both of the low-density areas illustrated examples of rationalising away intentions to select smarter choices. Convenience again appears to be extraordinarily important in that ease of vehicle access is the differentiating factor between the high-density and low-density private parking. In the case of the low-density neighbourhoods, the parking is not only on private ground - it is immediately accessible en route between leaving the home and the road. This distinction can be theorised as supporting a neighbourhood culture of driving, based on the development of a local social norm. The findings in this regard suggest two things in particular. Firstly, that private residential parking is an important factor in both the owning and the use of *personal* rather than household vehicles (a contrast apparent between the high- and low-density areas). Secondly, it can be theorised that it is the predominance

of the personal (rather than the shared) cars that is the crucial tipping factor in a creating a neighbourhood culture of driving rather than a more multi-modal environment (Figure 9.1).

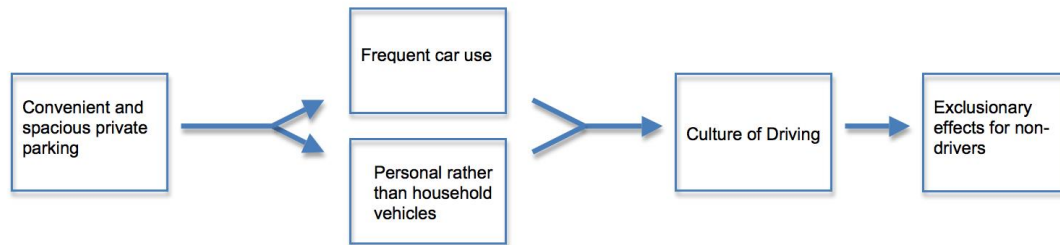


Figure 9.1 Residential Parking and Cultures of Driving

The theory of convenience in residential parking as a driver of reduced car ownership and use is directly supported by accounts from the high-density urban drivers about avoiding car use in order to retain a parking spot or anticipated difficulty gaining another space later. Indirectly, a further point can be considered: although parking in the two low-density areas is far easier than in the high-density areas, it is also possible to differentiate between the low-density urban and peripheral areas in terms of convenience of parking. The low-density urban houses sit in larger grounds so that there is no need for street parking, whilst the peripheral properties were more likely to have a small front garden and a large back garden with no car access to the rear, reducing the ease of parking on private ground. This might go some way towards explaining the greater difficulty contacting potential drivers in the low-density urban area using the sampling protocol

The car can be considered a competitive form in relation to other modes, reducing both economic and spatial resources available for other modes and diminishing the attractiveness of the environment, especially for walking and cycling (Adams, 1999; Pucher and LeFevre, 1996). However, taken across the four neighbourhoods, the issue of parking illustrates the idea of the car as a competitive form more in terms of local cultural norms than in terms of crowding out. Convenient (and spacious) private residential parking

in a more dispersed urban form can create a cultural norm of car-dominance at local level, although there is no physical crowding-out of non-motorised travellers. The freedom to park easily afforded by the property at the beginning as well as at the destination seems an important factor influencing travel behaviour.

Theme 5: Density and Multimodality: Cultures of Walking; Cultures of Driving

The distinction between potential and current drivers was blurred in the high-density areas. Both current and potential drivers used cars as one of many modal options: the current drivers commonly spoke of using alternative modes, whilst the potential drivers hired and borrowed cars when they wanted them. This applied to both leisure and work-related trips. In comparison with the low-density urban participants, as well as mentioning non-car transport in relation to wider variety of trips, the high-density residents used a greater variety of modes, including more active travel options.

9.4.2 Objective 3: Travel Choices and Perceptions of Inclusion/ Exclusion

Without imposing a pre-determined framework of dimensions of inclusion/ exclusion, the in-depth interviews generated data relating to car ownership/use and other forms of mobility, which could be understood in terms of either inhibiting or facilitating social participation. The primary focus of this research is social *inclusion* specifically. However, exploring the positive aspects of the findings without acknowledging the negative components would present a partial and misleading picture.

Urban form, mobility and exclusionary effects

Note: the information provided here is to contextualise the findings on social *inclusion* rather than offer an analysis of exclusion.

Considerable trouble was taken to identify research participants who were in a position to make choices about whether, when and how to travel relatively free from constraint. In particular, in the light of the quantitative findings, it was important that participants were financially comfortable. Given the application of the sampling protocol, it might be anticipated that the financial cost of transport did not feature as an exclusionary effect. However, this was not the case: as was evident from the findings relating to parking charges, participants might be able to *afford* a cost quite easily and still consider it unreasonable value. Similarly what might seem a modest cost in time or convenience, such as changing from one bus to another in the city centre or standing for ten minutes on the underground might also be deemed unreasonable. Despite the fact that all the potential drivers shared a home with a current driver they all report exclusionary effects in terms of either turning down leisure opportunities or meetings with friends and family and/or experiencing social pressure to drive against their own inclinations. These exclusionary effects were not a major theme within any of the accounts. Nevertheless, it is worth noting firstly that even relatively affluent people without *personal*, as opposed to *household* car access experienced unwelcome social pressures and on occasion curtailed their social interactions; secondly, that they were predominantly experienced by women living in peripheral neighbourhood.

Current drivers, again predominantly from the peripheral neighbourhood, also experienced exclusionary effects in terms of concerns about safety when using public transport. Interestingly, these were all men; the women (including bus travellers, a mode with a poorer reputation for security) tended to be somewhat dismissive of safety concerns.

In consideration of social *exclusion* specifically, it must be reiterated here that this sample was based on affluent participants: those male participants with safety concerns about public transport travelled in taxis when they were not driving. Likewise, the hierarchy of modal preference for motorised transport throughout the qualitative investigation has overall been first the car, secondly the train and thirdly the bus (again, there are gender

inconsistencies here with women being more positive about bus travel). Train travel is generally more expensive than travelling on buses; this sample is of people who can afford to choose the train, living along well-served transit routes.

Finally, inhabitants of both the high-density urban areas spoke of traffic as a concern, mostly with regard to the freedom of their children to walk in the area but also in terms of not enjoying walking on particular routes of modifying walking routes to avoid traffic.

Urban form, mobility and inclusionary effects

Within the peripheral neighbourhood, inclusionary effects in relation to urban form and mobility came in two forms, both of which involved an enjoyment of social contact. The first of these came as a by-product of the presence of local shopping and social amenities. The potential drivers regarded these as vital - not in relation to the necessity of shopping, which was generally managed using car transport, but for a sense of connection to the neighbourhood and for light social contacts. These benefits acted as both a product of and a reason for walking in the neighbourhood. Within the low-density urban area, the presence of local facilities seemed to function far less successfully as a neighbourhood hub. This might in part have been because of the failure of the sampling protocol to generate any potential driver contacts.

The second form in which urban form and mobility produced inclusionary effects for the peripheral neighbourhood also related to the potential rather than the current drivers. Two of these women spoke of public transport (both the train and the bus) as an enjoyable means of making social contacts. In one instance, sharing a regular route into the city was the basis of a lasting extended network of friendships, which went beyond the companionship of commuting.

Within the high-density areas, despite a dislike of cramped on-street parking and traffic, greater levels of multi-modality across both current and potential driver groups meant that discussion of walking within the neighbourhood, whether to and from public transport or using local amenities, was prevalent in the accounts. In contrast to the low-density neighbourhoods, participants from the high-density areas volunteered positive comments about community and told stories about friends and acquaintances in the area. The light contacts in the high-density areas also seemed a source of developing neighbourhood cohesion, as contacts were made across generational and cultural groups. Successful bonding over shared concerns (including difficult parking conditions) was also more of a feature in these narratives.

Recognition and a sense of being recognised within the area was, in some cases, a source of delight. Although dense neighbourhoods can house more transient populations, particularly in city centres, an attachment to place borne of this familiarity and recognition was exhibited by some of the participants in both of the high-density areas. The anticipated life-stage pattern of young people living in more central/ urban housing and then moving out to the suburbs as they have children or near retirement although apparent in several of the peripheral accounts, was far from universally followed by the high-density participants: one older couple had moved *in* to the city centre, attracted by the design of apartments available; an older lady in the high-density urban neighbourhood was dismissive of the idea of moving to a suburban location since she would lose her local urban community; two couples with young families had grown attached to their urban neighbourhood, again citing local community; and participants from both central and high-density urban locations expressed an attraction to a rural environment if they were to move rather than a suburban dwelling. For all that some commentators have been dismissive of the 'urban village' idea as romanticised (Harvey, 2000; Smith, 1996), this latter finding suggests that the concept is not without foundation in that, for at least

some participants, dense urban living can offer comparable benefits to those they have experience in actual village life.

Central and high-density urban residents commented on increased levels of physical activity since moving to these neighbourhoods. This was as a result of greater levels of active travel, use of public transport and, most specifically, larger amounts of walking associated with local shopping. These changes were referred to positively as a benefit of living in the area making the participant feel healthier and take pleasure in the environment.

Strikingly, the changes in physical activity were unplanned and unanticipated. Comparing the reasons high-density dwellers gave for their locational choices to narrative sections relating to what they liked about their neighbourhoods also clearly indicated that the contact and recognition that they valued about their current homes was also not something they had anticipated prior to moving into the area.

9.4.3 Conclusions from the Qualitative Analysis

The qualitative analysis has employed five theoretical building blocks:-

- **Space:** understood initially in terms of density and centrality/peripherality and later developed to recognise the private parking space.
- **Affective factors:** attitude towards different modes, strong identification as a driver or with the interests of drivers was being particularly notable; aspirations to healthier or more environmentally sustainable living.
- **Travel behaviours:** actual modal choices as revealed in participant accounts; in particular contrasting car ownership/use and smarter choices.

- **Inclusionary effects:** emergent categories positively associated with social participation.
- **Exclusionary effects:** emergent categories negatively associated with social participation.

Taken in concert, the five emergent themes developed in Section 9.4.1 demonstrate a pattern of inter-relationships between space, affective factors and modal choice. Using an inductive analytical approach, factors with had inclusionary or exclusionary effects on the participants were also identified.

The relationship of urban density to car ownership and use can be theorised by drawing on the contrasts between the low-density and high-density urban neighbourhoods. Convenience appears to be a driver of modal choice to an extraordinary degree. Within the non-dense environments, having a car on the premises (garaged or in the driveway) readily outweighed aspirations to healthier or more environmentally sustainable living. Even participants who do not overtly aspire to either of these things seem to display some sense that they perhaps *ought* to do so, and embed rationalisations of their travel choices into their narratives⁵¹. All other things being equal, where participants had a personal vehicle, they would use it. Circumstances in which things were not considered equal included parking charges and congestion. Although difficulty parking at the destination was also cited as objectionable, it seemed to be borne and resented rather than stimulate modal shift.

Although local amenities and shopping provided a focal point for the potential drivers in the peripheral area, both of the low-density areas exhibited a culture of driving; walking was viewed as aberrant and those who did not drive experienced some exclusionary effects, despite living relatively affluent lives.

⁵¹ Ironically, some of the low-density potential drivers seemed to experience a sense that *they* ought to be driving.

The use of public transport to some extent proved a mitigating factor, providing a source of contact and, in one case, a network of friends. However, there were gendered elements to this benefit and participants accustomed to car travel found public transport use particularly challenging.

In accordance with the theory that both centrality and density reduce car dependence, the central area provided evidence of major changes in levels of car ownership, as well as reduced use. A culture of walking was associated with density rather than centrality; in both dense areas, there were higher levels of multimodality and less distinction between the travel behaviours of the current and potential drivers. Within the high-density urban area there were also reductions in ownership, although these seemed less striking in that participant couples chose to have one vehicle rather than two. Although there was an example of a residential selection based on frustration with commuting (rather than driving specifically), there was no evidence that the high-density participants were attracted to these areas because of a desire not to drive: the sample included participants who strongly identify as drivers including at least one car enthusiast and several who actively enjoyed driving.

Drawing from the participant accounts this walking, whether recreationally, to use local amenities or public transport can be theorised as the pivotal activity associated with the inclusion effects valued by the high-density dwellers: physical exercise and a corollary sense of wellbeing, recognition, familiarity, sense of community and neighbourhood attachment.

In terms of travel behaviours exhibited within the participant accounts, density accompanied by centrality over-rode a sense of driver identity. Although remaining vehement on the topics of parking charges, congestion and, in some cases expressing and enjoyment and appreciation of cars and driving, both ownership and use seem radically reduced by the combination of density and centrality. Participants discussed increased use smarter choices since moving to these neighbourhoods - most specifically walking,

although there were also examples of cycling as well as greater use of public transport. These changes had corollary inclusionary effects and were mirrored to a lesser extent in the low-density urban area.

In contrast, in both of the low-density areas convenient residential car access has been theorised as increasing both car use and personal car ownership, over-riding any inclinations to make smarter choices. There are concomitant exclusionary effects for low-density residents who do not drive, although these are ameliorated to some extent by local amenities and access to public transport. These ideas are summarised in Figure 9.2.

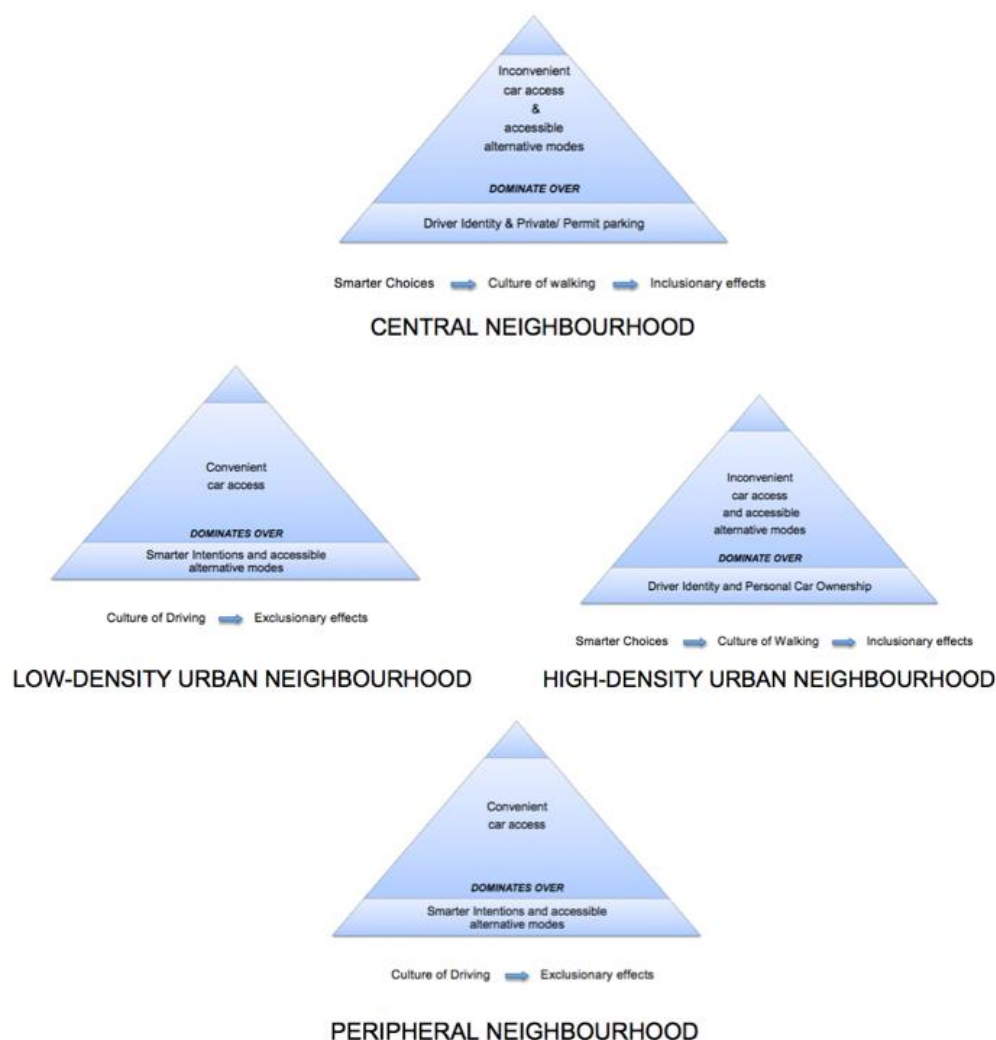


Figure 9.2 Space Dominates Attitudes: Theorising the Qualitative Findings

9.5 The Contribution of Mixed Methods

Whilst individually both phases of the research have contributed towards the aims of the research, it would not be possible to fulfil those aims without a mixed methods research design. Drawing from the quantitative results, consumption inclusion was found to be the only dimension of inclusion statistically correlated with level of car ownership. This correlation, alongside the predictive success of the spatial variables and the failure to demonstrate any significant correlation between car ownership and civic or social interaction, informed the direction of the research with regard to fulfilling the aims of the research.

The quantitative phase was particularly important in respect of aims 1 and 2. With regard to the first aim, in order to evaluate the extent to which an urban renaissance could reduce levels of car ownership without inhibiting levels of social inclusion it was necessary to identify key dimensions of inclusion and search for statistically significant relationships with car ownership. The presence of such relationships - particularly if a dimension of inclusion is a positive predictor of level of household car ownership - would suggest that policy measures designed to reduce car ownership might also adversely impact upon social inclusion along that dimension. Both bivariate and multivariate analyses were important to fully understand the relationship between car ownership and each dimension as well as the relative importance of the different dimensions. The finding that, of the dimensions tested, *only* consumption inclusion was a successful predictor of level of car ownership had three main implications:

- a) The absence of correlation with the civic and social interaction indicators opened the possibility that it might be possible to constrain car ownership and use without negatively impacting upon inclusion along these dimensions. In short, this analysis suggests that *given an 'included' income threshold*, it is otherwise possible to be socially included and civically without a car. However, qualitative exploration

could be used to compensate for limitations in this analysis by opening the analysis to include other dimensions of inclusion, important from the perspectives of the participants.

- b) As variables proxying both centrality and density demonstrated an intervening effect between the income-car ownership relationship quantified by the consumption inclusion variables, it became necessary to understand the mechanisms through which these factors had an effect on car ownership. Qualitative exploration could be used to investigate this issue and provide data on car ownership as well as other modal choices.
- c) All of the consumption inclusion variables exhibited highly significant positive correlations, including some of very considerable magnitude. This finding generated an imperative to confirm that there were indeed circumstances where relatively affluent people would choose residential locations which in some way inhibited car ownership. Furthermore, were these choices providing inclusionary benefits, as proposed by the compact city hypothesis, or were they a source of exclusionary effects with which the urban dwellers were discontent.

In view of the second aim, building a dataset which included both household income variables and spatial variables was important in order to assess the potential for de-coupling rising family incomes from increasing levels of car ownership. Designing such variables and including them in the analysis was necessary to address possible conflation between wealth and locational effects as predictors of car ownership. Including demographic variables, especially those identified as being associated with risk of social exclusion, was also imperative in order to control for confounding factors. The quantitative analysis established that, holding income and spatial factors stable, several demographic were still important to understanding car ownership:

- a) Certain life stage factors had a negative impact on level of car ownership, most importantly in terms of magnitude of effect, being over 75 years old. Being aged 17-24 years and, to a lesser extent, being between 65-74 years also demonstrated negative correlations.
- b) Gender is still an important concern, with female gender reducing the odds of level of car ownership being in a higher category to 43% of what they would otherwise be with a male head of household⁵².
- c) Two social class variables based on occupation, drawn from the original production inclusion indicator also retained a significant effect when controlling for income and spatial factors. With a long-term sick or disabled head of household, the odds of level of car ownership being in a higher category are reduced to 57% of what they would otherwise be, whilst having a self-employed head of household increases the probability of higher car ownership by 218%.

In combination, these findings supported the third aim of the research: to identify robust strategies for reducing levels of car ownership and use without inhibiting social inclusion. They achieved this by contextualising the qualitative phase with robust data, which has confirmed the magnitude and direction of the effects of urban density and centrality whilst controlling for income and confounding demographic variables. They also provided a framework for the qualitative analysis, underpinning the importance of understanding the travel behaviour of people with choices, whilst employing research instruments that are not prescriptive with regard to the nature of social inclusion.

In a complementary fashion, the qualitative research has extended the quantitative findings and, to some extent, explained them. The design and

⁵² Whilst interaction effects with age were not tested in order to keep the model relatively parsimonious, it should be noted that although the proportion of women gaining a driving licence is drawing nearer to that of men, the qualitative work suggests a pattern of women *with* driving licences ceasing to drive as they age. As Lucas points out, given the women's longer life-span, gender is likely to remain a concern for women and social exclusion (2004).

adoption of a narrative/semi-structured interview format allowed for an understanding of social inclusion, *as it seemed important to the research participants*. Life history reflections, integrated with data about travel behaviour and affective factors relevant to residential choice and mobility, successfully generated an understanding of the relationships between urban form, modal choice and social inclusion grounded in the perspectives of the participants.

However, the qualitative analysis has also reflected back upon the quantitative operationalisations of *civic* and *social interaction inclusion*. In both cases, the qualitative work suggested that the indicators employed in Phase One used too restricted a definition. Civic inclusion, in respect of the very limited ways in which it appears in the narratives, was not evidenced in the terms codified in the original Burchardt *et al* (2002) conception. Similarly, social interaction inclusion, as apparent in the narratives, related more to light social ties and a sense of community at neighbourhood level than in terms of emotional support. These findings tend to reinforce the quantitative analysis at the level of there being no correlation between car ownership and those two forms of inclusion as operationalised in Phase One of the research. They also suggest that indicators which accommodate less formal civic activities and a more outward-looking conception of social interaction would function more effectively in terms of increasing our understanding of how social inclusion and car ownership inter-relate within urban contexts.

The qualitative work indicates that relatively affluent households in dense and, most especially, central environments exhibit greater multi-modality and consequently, greater levels of active travel. Additional to this finding, the changes in travel behaviour which followed after moving into higher-density areas were accompanied by gains in some forms of social inclusion. These came in the form of an enjoyment of recognition in casual local acquaintances, pleasure in familiarity with the neighbourhood and improved wellbeing through greater physical exercise. In some cases, participants also expressed an appreciation of community and a sense of attachment to

neighbourhood which they attributed to these inclusionary effects. Relatively affluent households found that *decreased* levels of car ownership and use were in some circumstances accompanied by a greater sense of social inclusion along some axes.

These findings are, however, qualified as follows. The nature of the properties and the urban environment were repeatedly cited as reasons for selecting the high-density neighbourhoods in the first instance. As noted in Chapter 6, Glasgow has extensive greenspace, including a country park and a considerable amount of mature Victorian parkland within its boundaries. Likewise, some of the high-density properties were stone-built and of Victorian or Edwardian origin. The size of the rooms and the height of the ceilings were important to many participants and, crucially, gave them status as potential family homes. Participants from all areas opposed the Glaswegian tenements to smaller modern apartments. Furthermore, the low-density urban neighbourhood can be considered an atypical land use within the European context in that relatively large and expensive properties situated in sizeable gardens are not normally found close to a city centre. Similarly, whilst the findings from Central neighbourhood participants suggest that spatial factors outweigh affective attachment to car ownership and use, these can also be considered special circumstances to some extent; by definition, not everyone can live near a city centre. However, the Central findings and the strong connections between travel behaviours in the high-density neighbourhoods do reinforce the possibility high-density urban could serve to loosen the correlation between wealth and car ownership and use.

Two further caveats remain. Firstly, there was a necessarily selection bias in the sample for each neighbourhood in that the participants all had the economic means to live in a different kind of area and outside of the Central area, the direction of causality between choosing to drive less and choosing to live in a higher-density area was less clear. Secondly, the socio-demographic composition of the qualitative sample along with the quantitative analysis indicates the importance of life-stage as a feature in

both residential and travel choices. If urban location is indeed the primary driver of car ownership and use for urban households, will a pattern of households moving to the suburbs as they have children inevitably undermine the sustainability of high-density urban communities? As a final note on evaluating the potential of an urban renaissance, it is interesting that the sampling protocol readily found exceptions to this pattern and, unlike the Central neighbourhood, the high-density urban area supported a far greater range of household types, including families with young children.

Having evaluated the extent to which an urban renaissance could reduce levels of car ownership without inhibiting social inclusion and assessed the potential for de-coupling rising family incomes from increasing levels of car ownership and use, the remainder of the thesis addresses the third aim of the research by offering policy implications based on the findings and then summarises the contribution of the research before concluding briefly.

9.6 Policy Implications

This research carries implications for three main strands of policy, detailed below.

Transport and modal shift

The dominance of spatial factors over affective concerns is perhaps the most striking finding from this research: people who strongly identify as drivers and regard the car as an important part of life can, *within the right circumstances* - see below, exhibit greater levels of multimodal behaviour and even forego owning a car. This would suggest that smarter choices initiatives are targeted geographically at areas where there is most scope for success: relatively dense, mixed use neighbourhoods with high service levels of public transport. In lower density suburban areas, economic levers such as parking charges at destination points - the stick rather than the carrot - seems a more fruitful approach. This, however, is likely to impact

negatively on social inclusion, as end-point charging does not generally discriminate on ability to pay.

Considering TDM and the lower-density areas where convenient private parking was theorised as out-weighting inclinations towards making smarter choices: within metropolitan areas covering more than one local authority districts, it should be important to agree co-ordinated parking charges across administrative boundaries in order to avoid diverting traffic from one area to another.

Urban Planning and Regeneration

Both qualitative and quantitative findings indicate that increasing the availability of relatively dense housing could reduce levels of car ownership and use. The contribution of the qualitative research to the statistical backdrop of the Phase One analysis is in offering an insight into what *kind* of dense housing might both attract and retain potential urban dwellers. The findings are clear that elements of high-density living, in particular traffic and parking difficulties remain unattractive even to the committed urban dwellers. However, the combination of attractive greenspace, properties with sizeable rooms and, occasionally, some feature of architectural interest served to attract inhabitants to higher-density areas in the first instance. It seems likely that many of the high-density participants might not have classified themselves as natural ‘urbanists’ (see Schwanen and Mokhtarian, 2005): some have also lived in rural areas and would consider moving back to a rural environment if they were to change location; some regarded their move to a high-density neighbourhood as temporary, until they became more familiar with the city; some were explicit in describing themselves as solitary or even anti-social. However, offering a high quality urban environment with large apartments and good access to greenspace can overcome cultural prejudices about high-density living. Within the bundle of locational choice, a neighbourhood culture of walking can support increased social inclusion and place attachment.

The key lessons here for urban regeneration and planning are that increasing urban density through a strategy of infilling greenspace is a strategy that should be viewed with caution. Secondly, evidence from the life-histories of some tenement dwellers in Glasgow indicate that designing modern properties with rooms of greater number and size could encourage a more European attitude towards high-density dwelling: flats as well as houses can make good family homes. Tentatively, inter-mixing properties like this amongst conventionally suburban areas might also go some way to diluting the local culture of driving in the neighbourhood by increasing foot traffic and multi-modal behaviour in the area.

Finally, emphasising the above points within a different context: a short note relating to modal shift and active travel. Two aspects of the findings relating to increased level of active travel within the high-density environments. Firstly, this increase is an *unintended* consequence of locational choice; secondly, although dense, these are relatively attractive and green neighbourhoods with local amenities on hand.

Social inclusion/ exclusion

That some individuals or groups of people are, to paraphrase Burchardt *et al.* (*ibid.*), *unable to participate in key social activities* is rightly an important policy concern, touching on both natural justice and social cohesion. Within that context, this investigation prompts a caveat. Although quantifying problems is a necessary aspect of the policy process for justifying expenditure, targeting resources and measuring success, complementary qualitative research can offer insight into the priorities of the people under study and, through understanding those priorities, insight into levers for change. In this case, the high-density dwellers unquestionably dislike the level of traffic in their areas and that they are sometimes reluctant to use their cars because of lack of parking space. However, the narrative/ semi-structured technique contextualises these disadvantages within their wider lived experience - and reveals that the unanticipated inclusionary advantages which spring from these constraints,

such as social interaction and exercise, bring an attachment to place that ultimately outweigh the disadvantages.

9.7 Summary of Contributions to Knowledge

This thesis offers conceptual, theoretical and empirical contributions to knowledge about relationship of social inclusion to car ownership and use within an urban context.

9.7.1 Main Conceptual Contributions

For understandable reasons, research within the field of transport geography has focused on *exclusion* (3.3.1), carrying the tacit assumption that without social exclusion, all is well. The first conceptual development this thesis offered was therefore an explicit focus on how urban mobility might relate positively to social participation and positioning the role of the car within that framework. This was achieved firstly by operationalising a concept of social inclusion as the inverse of established exclusion indicators (Burchardt *et al.*, 2002) and secondly using inductive analysis of interview data to identify inclusionary effects.

The work's second conceptual development was originality in using ordered logistic regression as a means of understanding the relative importance of different dimensions of inclusion/exclusion in relation to household car ownership in order to address criticism that quantitative analyses of social exclusion have failed to prioritise different dimensions (Levitas *et al.*, 2007). Furthermore, where previous work using the BHPS employed regional dummies (Hanley and Dargay, 2000), for this analysis new variables were devised which successfully demonstrated the significance of urbanisation in relation to level of household car ownership at different tiers.

Thirdly, recognising the sensitivity of car ownership and use as a research topic, drawing on the work of Wengraf (2001), a hybrid narrative/ semi-structured interview form was designed in order to generate high quality

data. The qualitative data relating to modal choice was situated within accounts of lived experience within different case study neighbourhoods and strenuous efforts were made to ensure the data remained uncontaminated by any agenda.

Finally, the research design adopted the innovative tactic of approaching moderately affluent people in order to understand the experiences, perceptions and attitudes of those in a position to make relatively unconstrained modal and residential choices. A sampling protocol was devised which successfully served this end.

9.7.2 Main Empirical Contributions

Within the context of previous operationalisations of conceptualising social exclusion in Britain (Barnes, 2005; Burchart *et al.*, 2002), the quantitative analysis was unusual in that it dealt with a sample of the whole population. As well as avoiding a trend to focus on labour market exclusion (Levitas, 2006), this approach provided a more comprehensive picture of the role of social inclusion, spatial scale and demographic factors in level of car ownership. Only one of the four inclusion indicators exhibited a significant relationship with level of household car ownership when controlling for other factors. The lack of a significant relationship between level of car ownership and civic or social interaction inclusion could be tentatively accepted as an indication that inclusion along those axes was independent of level of car ownership⁵³. Increased urban centrality and density were both found to correlate with lowered levels of car ownership, in accord with the compact city hypothesis (see Section 2.3). Surprisingly, the lowest-tier density variables, proxying density by accommodation type, proved more significant than the neighbourhood density variables, which operated at postcode level. It was posited that these variables functioned more successfully because they captured private parking as well as proxying the

⁵³ Potential reasons for finding this were not further illuminated in the qualitative research.

ease of access to local amenities captured by the neighbourhood variables. This tentative conclusion was corroborated by the qualitative analysis.

The empirical qualitative research generated data relating to life histories along with experiences of and attitudes towards neighbourhood and modal choice. This was analysed in terms of contrasts and connections between research participants from four case study areas. As a theoretical sampling strategy was employed, the products of this analysis are considered below in terms of theoretical rather than statistical generalisability.

9.7.3 Main Theoretical Contributions

This thesis offers insights into social inclusion as it relates to urban car ownership/ use from two perspectives. Building on the quantitative analysis, the population sampled are themselves ‘included’ in terms of economic consumption, in that they are able to make relatively unconstrained modal and residential choices. Within this context, studying the accounts of people who *could* drive but have chosen *not to* has offered a means of gaining insight into circumstances where the correlation between family income and car ownership/ use might break down.

Whilst research has demonstrated that affective issues contribute to modal choice (Steg, 2005), the primary finding from this aspect of the research is the dominance of spatial over affective factors: residential centrality and density rather than attitudes seem to be the primary drivers of modal choice. The high-density interviews provide evidence of participants who have made (unplanned) reductions in car ownership/use following their relocation to the area, as well as voluntarily limiting their car ownership and using other modes because of constrained residential parking. Crucially, this finding applies to people who identify strongly as drivers and might be described as having relationships with their cars indicative of their “lifestyle sub-cultures” (Gartman, 2004, p.192); identifying with the interest of drivers, loving cars for their aesthetic value and enjoying driving can be quite compatible with rarely using a private car - even with not owning a

vehicle. Reviewing the empirical evidence base, transport psychology research in particular presented grounds for optimism with regard to the urban renaissance without the car (Section 3.3.3). However, that 45% of current drivers might be categorised as either *malcontented motorists* or *aspiring environmentalists* (Dudleston *et al.*, 2005) may be of less import if the nature of urban form outweighs personal inclinations.

However, further findings theorised on the basis of both the qualitative and quantitative work presented in this thesis could be of value here. The mobility offered by the car makes it the default mode of choice, unless there are intervening factors. The role of space within this thesis can also be understood in terms of convenience: both centrality and density can improve the accessibility of social and economic opportunities. Furthermore, this research has theorised that convenient private residential parking is a crucial element influencing level of car ownership and use, positively in low-density neighbourhoods and negatively in high-density areas. Within low-density environments, that convenience supports the easy rationalisation of aspirations to smarter choices; in high-density environments, the inconvenience supports smarter choices. The impact of residential parking on car ownership and use has not hitherto been an area of focus for transport research, other than with regard to issues of perceived equity or the quality of the urban realm (Litman, 2010; van de Coevering, 2008). However, the tenacity of residents with regard to protecting their private parking has been remarked upon (Stubbs, 2002).

The second route through which this research has delivered insight into social inclusion and urban car ownership and use is through a narrative/semi-structured interview technique which has been used to develop an understanding of social inclusion from the perspectives of the research participants, as it related to their residential and modal choices. As discussed above, the evidence presented in this thesis favoured derived demand over affective concerns with regard to modal choice. Furthermore, bearing in mind the caveats about the affluent nature of the participants' neighbourhoods, it also supports Burton's tentatively positive endorsement

of the compact city insofar as the low-density participants demonstrated more multi-modal behaviours and activities such as car-sharing, -borrowing and -rental rather than simply ownership. Considering the neighbourhood bundle of attributes (Storper and Manville, 2006), the longitudinal perspective afforded by the interview method demonstrated that generally property and neighbourhood characteristics dominated accessibility in terms of locational choice. Whilst high-density participants were unhappy about poor parking and the environmental disbenefits of traffic, these exclusionary factors were outweighed by the attractions of large flats with local amenities and good access to greenspace. Like the respondents from the Bretherton and Pleace (2008) survey, research participants noticed space and architectural design rather than density as the defining features of their homes. Interestingly in respect of Schwanen and Mokhtarian's work on neighbourhood mismatch (2005), participants who would not readily be recognised as 'urbanites' had become attached to the high-density neighbourhoods that they first moved into when coming to the city.

The qualitative findings have been conceptualised in terms of multi-modality, cultures of walking, inclusionary/exclusionary effects and place attachment. Stress on parking places was shown to influence decisions on car ownership as well as use. The trend in higher-density neighbourhoods towards sharing, borrowing and hiring cars along with the use of household, rather than *personal*, vehicles was theorised as constituting a tipping point between a local neighbourhood culture of walking and a culture of driving. The following were identified as inclusionary effects arising from the culture of walking in the high-density neighbourhoods:

- Increased active travel for both instrumental and leisure purposes
- Increased exercise due to buying more shopping locally when on foot
- Wellbeing associated with increased exercise and sense of achievement

- Pleasure in familiarity with the neighbourhood and other inhabitants
- Pleasure in receiving recognition and social exchanges with other inhabitants (including shopkeepers)
- Positive sense of community

Cumulatively and individually, these benefits were associated by some participants with an attachment to neighbourhood, which could itself be considered an inclusionary effect. Notably, these inclusionary advantages were generally an unintended by-product of the local culture of walking - they were not anticipated in the original residential choice. Nevertheless, they recurred in descriptions of what the high-density participants valued about their homes. Returning to Schwanen and Mokhtarian's analysis (*ibid.*), this suggests that being an urbanite/ suburbanite may be a mutable state. This being the case, although there must be multiple provisos in relation to the specific geography, infrastructure, amenities and architecture of the city where the analysis took place, these findings are nevertheless situated within the tradition of Jacobs and Mumford: the lived experience of an attractive high-density environment with access to public transport, local amenities and pleasant greenspace can confound cultural expectations.

9.8 Future Research

The most obvious scope for development of the quantitative research presented here lies in deploying the new spatial variables in a panel analysis. This could be used to track changes in the relationships between urban location and form over time and produce predictions of how future dynamics might operate in the light of changes in population, property availability or economic conditions. Panel data is particularly useful for monitoring the composition of groups of interest and understanding how that composition changes over time (Baltagi, 2005); with reference to the qualitative research, a panel based on the model developed here would be

of interest in terms of understanding transitions between carlessness and ownership of one, two or more vehicles in two adult households. Hypotheses generated on the basis of the qualitative work could be tested using this data. Testing the influence of private parking quantitatively would also be of interest. However, a secondary dataset would offer no insight into the nature of the parking; further investigation based on primary data might be a more useful approach.

As regards developing the qualitative work, the narrative/semi-structured method was highly generative and, within the limitations of this work, it was not possible to fully address the interviews as narratives. To compensate for this, longer quotations were used within the thesis as far as constraints of space would allow. However, mapping associations within individual narratives more fully would foster greater understanding of the role of mobility within the lives of these urban dwellers. Attempting a similar process within other British cities would also be of interest, not so much in terms of corroborating results but rather refining an understanding of the relationships between change in urban location and changes in mobility and modality.

9.9 Social Inclusion and the Urban Renaissance

Without the Car

The topic of this thesis can be phrased in terms of a binary question: *can we have* social inclusion and the urban renaissance without the car? On the basis of the research presented here, it is possible to deliver a qualified ‘yes’, as well as providing some direction as to how that might be achieved. The quantitative phase of the research has shown that the impact of household income on levels of car ownership was mediated by urbanisation on three spatial tiers: settlement, neighbourhood and property levels. Building on these findings, the qualitative phase confirmed different patterns of car *use* as well as of car *ownership* across different urban areas, demonstrating that radical (and unplanned) changes in modal choice can

follow relocation to more dense and central urban environments. Furthermore, it was shown that the size and perceived quality of residential properties, along with the presence of greenspace and local shops, could build a sense of attachment to relatively dense urban environments. Spatial constraints on car ownership and use along with increased levels of walking and consequent familiarity with other local residents were found to be core components of this process.

LIST OF REFERENCES

- Aarts, H. and Dijksterhuis, A. (2000) "Habits as Knowledge Structures: Automaticity in goal-directed behaviour", *Journal of Personality and Social Psychology*, Vol.78 (1), pp.53-63.
- Aarts, H., Verplanken, B., & van Knippenberg, A. (1997) "Habit and information use in travel choices." *Acta Psychologica*, 96, pp.1-14.
- Acheson, S.D. (1998) *Independent Inquiry into Inequalities in Health*, London: HMSO.
- Adams, J. (1999) "Hypermobility", *Prospect* March 2000, pp.27-31.
- Adams, J. (1999b) *The Social Implications of Hypermobility*, Paris: OECD.
- Adams, J. (2005) "Hypermobility: A challenge to governance" in Lyall, C., and Tate, J. (Eds) *New Modes of Governance: Developing an Integrated Policy Approach to Science, Technology, Risk and Environment* Aldershot: Ashgate.
- Aldrich, J.H. and Nelson, F.D. (1984) *Linear Probability, Logit, and Probit Models*, London : Sage Publications.
- Aldridge, J.M. et al. (1999) cited in Creswell, J.W. and Plano Clark, V.L. (2007) *Designing and Conducting Mixed Methods Research*, London: Sage, p.76.
- Alvord, K. (2000) *Divorce Your Car*, Gabriola Island, BC: New Society.
- Anable, J.; Kirkbride, A.; Sloman, L.; Newson, C.; Cairns, S. and Goodwin, P. (2004) *Smarter Choices: Changing the way we travel. Case Study Reports*. Report for the UK Department for Transport. London: DfT.
- Anable, J., & Gatersleben, B. (2005) "All Work and No Play: The role of instrumental and affective factors in work and leisure journeys by different travel modes" *Transportation Research Part A: Policy and Practice*, 39 pp. 163-181.
- Appleyard, D. (1981) *Livable Streets*, Berkeley, University of California Press.
- Arksey, H. and Knight, P. (1999) *Interviewing for Social Scientists*. London: Sage.
- Atkinson, R. (2006) "Padding the bunker: strategies of middle-class disaffiliation and colonization in the city", *Urban Studies* 43(4) pp.819-832.

Atkinson, A, B and Hills, J (Eds.) (1998) *Exclusion, Employment and Opportunity*, London, London School of Economics and Political Science, Centre for Analysis of Social Exclusion.

Bae, C.C. (2004) "Transportation and the Environment" from Hanson, S. and Giuliano, G. (Eds) (2004) *The Geography of Urban Transportation (Third Edition)* London: The Guildford Press.

Bailey, N. (2006) "Does work pay?" from Pantazis, C., Gordon, D., and Levitas, R. (Eds) (2006) *Poverty and Social Exclusion in Britain: The millennium survey*, Bristol: The Policy Press.

Bailey, N., Spratt J., Pickering, J., Goodland, R. and Schucksmith, M. (2004) *Deprivation and social exclusion in Argyll and Bute: Report to the Community Planning Partnership*, Scottish Centre for Research on Social Justice, Universities of Glasgow and Aberdeen
http://www.scrsj.ac.uk/media/media_69649_en.pdf, accessed 19th February 2010.

Baltagi, B.H. (2005) *Econometric Analysis of Panel Data (Third Edition)*, Chichester: John Wiley and Sons.

Bamberg, S., Ajzen, I. and Schmidt, P. (2003) Choice of travel mode in the theory of planned behaviour: The roles of past behaviour, habit and reasoned action. *Basic and Applied Social Psychology* 25(3), pp.175-187.

Banister, D. (2005) *Unsustainable Transport: City Transport in the New Century*, London: Routledge.

Barnes, M. (2005) *Social exclusion in Great Britain: An empirical investigation and comparison with the EU*, Aldershot: Ashgate.

Barry, B (1998) *Social exclusion, social isolation and the distribution of income*, London: Centre for Analysis of Social Exclusion, London School of Economics.

Bechhofer F. and Paterson L. (2000) *Principles of Research Design in the Social Sciences*, London: Routledge.

Begg, D. (1998) 'Car Free Cities' in Reducing Traffic In Cities: Avoiding The Transport Time Bomb, Third Car Free Cities Conference, Edinburgh, June 1998, cited in Stradling, S. (2002) "Persuading people out of their cars", Napier University Professorial Lecture, March 2002.

Berghman, J. (1995) 'Social Exclusion in Europe: Policy Context and Analytical Framework', in Room (1995) *Beyond the Threshold: The Measurement and Analysis of Social Exclusion*, Bristol: The Policy Press.

Berthoud, R. and Gershuny, J. (Eds.) (2000) *Seven Years in the Lives of British Families: Evidence on the dynamics of social change from the British Household Panel Survey*, Bristol: Policy Press.

Black, W.R. (2000) "Socio-economic barriers to sustainable transport", *Journal of Transport Geography*. 8 pp.141-147.

Black, W.R. (2003) *Transportation: a Geographical Analysis*, London: The Guilford Press

Bloor, M. (1997) "Addressing Social Problems Through Qualitative Research" from Silverman, D. (Ed) *Qualitative Research: Theory, method and practice*, London: Sage.

Boarnet, M.G. and Crane, R. (2001) *Travel by Design: The Influence of Urban Form on Travel*, New York: Oxford University Press.

Bourdieu, P. (1986) "The Forms of Capital" in Richardson, J.G. (Ed) *Handbook of Theory and Research for the Sociology of Education*, pp. 241-258.

Bramley, G. (1997) "Poverty and local public services" in Gordon. D. and Pantazis, C. (1997) *Breadline Britain in the 1990s*, Aldershot: Ashgate.

Bramley G, and Morgan J, (2003) "Building competitiveness and cohesion: the role of new house building in central Scotland's cities", *Housing Studies* 18 pp.447- 471.

Bramley G., Brown C., Power S., Dempsey N., 2006, "What is sustainability and how do existing urban forms perform in nurturing it?" presented at the Planning Research Conference, University College London.

Brannen, J. (2005) "Mixed Methods Research: a discussion paper", ESRC National Centre for Research Methods, Review Paper, December 2005.

Breheny, M. (1996) "Centrists, decentrists and compromisers" from Jenks, M., Burton, E. and Williams, K. (Eds) (1996) *The Compact City: A Sustainable Urban Form?* London: E & F.N. Spon.

Breheny, M. (1997) "Urban compaction: feasible and acceptable?" *Cities* 14(4) pp.209-217.

Bretherton, J. & Pleace, N. (2008) *Residents' views of new forms of high density affordable living*, Coventry/York: Chartered Institute of Housing/Joseph Rowntree Foundation.

Bruegmann, R. (2006) *Sprawl: A Compact History*, London, University of Chicago Press.

Brundtland (see WCED)

Bryman, A. (2004), *Social Research Methods, Second Edition*, Oxford, Oxford University Press.

Bryman, A. (2005) 'Why do we need mixed methods? Should we differentiate integration versus mixed-methods?' Paper presented at the ESRC conference "Mixed methods - identifying the issues", University of Manchester 26-27 October 2005.

Bullard (1999) "Environmental justice challenges at home and abroad" in Low, N. (Ed) (1999) *Global Ethics and Environment*. London: Routledge.

Burchardt T., Le Grand, J. and Piachaud, D. (1999) *Social Exclusion in Britain 1991–1995 in Social Policy and Administration*, Vol. 33, No. 3, pp.227-244.

Burchardt, T., Le Grand, J. and Piachaud, D. (2002) 'Degrees of Exclusion: Developing a Dynamic, Multidimensional Measure', in *Understanding Social Exclusion* from Hills, J., Le Grand, J. and Piachaud, D. (Eds), New York: Oxford University Press pp.30-43.

Burchardt, T. (2000) 'Social exclusion: concepts and evidence', in D. Gordon and P. Townsend (eds.), *Breadline Europe: The Measurement of Poverty*, Bristol: The Policy Press.

Burden, T. & Hamm, T. (2000) "Responding to Socially Excluded Groups", in J. Percy-Smith (Ed.) *Policy Responses to Social Exclusion*, Buckingham: Open University Press.

Burningham, K. and Thrush, D. (2002) "Experiencing environmental inequalities: the everyday concerns of disadvantaged groups" *Housing Studies* 18 (4) pp. 517-536.

Burton, E. (2000a) "The Compact City: Just or Just Compact? A Preliminary Analysis", *Urban Studies*, 37(11), pp.1969-2006.

Burton, E. (2000b) "The potential of the compact city for promoting social equity", in *Achieving Sustainable Urban Form* (eds K. Williams, E. Burton and M. Jenks), London: E & FN Spon.

Burton, E. (2001) "The Compact City and Social Justice - A paper presented to the Housing Studies Association Spring Conference, *Housing, Environment and Sustainability*, University of York, 18-19 April 2001.

Burton, E. (2003) "Housing for an Urban Renaissance: Implications for Social Equity" *Housing Studies*, 18(4), pp537-562.

Burton, E. and Mitchell, L. (2006) *Inclusive Urban Design: Streets for Life*. Oxford: Architectural Press.

Byrne, D. (2005) *Social Exclusion, (Second Edition)*, Buckingham: Open University Press.

Cahill, M. (1998) "Consumerism and the future of social policy" in Ellison, N. and Pierson, C. (Eds.) *Developments in British Social Policy* pp.247-259.

Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., and Goodwin, P. (2004) *Smarter Choices - Changing the Way We Travel, Research report*, Department for Transport, London.

Carmona, M. (2001) "Implementing Urban Renaissance: Problems, Possibilities and Plans in South East England", *Progress in Planning* 56 (4).

Carter, H. (1981) *The Study of Urban Geography (Third Edition)* London: Edward Arnold Publishers Ltd.

CE Delft (2008) Internalisation measures and policies for the external cost of transport, Produced within the study Internalisation Measures and Policies for All external Cost of Transport (IMPACT) - Deliverable 3
Delft, CE, 2008 Commissioned by: European Commission DG TREN.

CEC (Commission of the European Communities) (2001) *European transport policy for 2010: time to decide*, White Paper, COM (2001) 370, Brussels: Office for Official Publications of the European Communities.

Cervero, R. (1998) *The Transit Metropolis: a global inquiry*, Washington D.C.: Island Press.

CfIT (Commission for Integrated Road Transport)(2002) *Paying for Road Use*, London: CfIT.

Chapman P., Phemister, E., Shucksmith, M., Upward, R., and Vera-Tuscano, E. (1998) *Poverty and Exclusion in Rural Britain: The dynamics of low income and employment*, YPS in association with Joseph Rowntree Foundation.

Cheshire, P. (2007) *Segregated Neighbourhoods and Mixed Communities: A critical analysis*, York: Joseph Rowntree Foundation.

Church, A. and Frost, M. (1999) *Transport and Social Exclusion in London: Exploring current and potential indicators*, London: London Transport Planning.

Church, A., Frost, M., and Sullivan, K. (2000) "Transport and Social Exclusion in London", *Transport Policy* 7, pp.195-205.

City of Edinburgh Council (CEC) (2001) *Towards a Sustainable Council*, Edinburgh: City of Edinburgh Council.

CNU (Congress for the New Urbanism) (2001) *Charter for the New Urbanism*, Chicago: CNU.

Coffey, A. and Atkinson, P. (1996) *Making Sense of Qualitative Data: Complementary research strategies*, London: Sage.

Corbin, J. and Strauss, A.C. (2007) *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory 3e*, London: Sage.

CO (Cabinet Office) (2006) *Reaching Out: An Action Plan on Social Exclusion*, London: Cabinet Office.

van de Coevering, P. (2008) "The future of residential parking in the Netherlands: the impact of increasing car ownership on the character of residential areas", European Transport Conference Proceedings, <http://www.etcproceedings.org/paper/the-future-of-residential-parking-in-the-netherlands-the-impact-of-increasing->, accessed 28th March 2010.

Creswell, J.W. (2003) *Research Design: Qualitative, quantitative and mixed methods approaches*, London: Sage.

Daly, M. (2006) Social Exclusion as Concept and Policy Template in the European Union, Cambridge, MA.: Working Paper no 135, Harvard University: Minda de Gunzburg Center for European Studies.

Daniels, P. and Warnes, A. (1980) *Movement in Cities*, London: Methuen.

Dant, T. (2004) "The driver-car" *Theory, Culture and Society* 21 (4/5) pp.61-79.

Dargay, J. M. (2001) "The effect of income on car ownership: evidence of asymmetry" *Transportation Research Part A* 35 pp.807-821.

Dargay, J. M., (2002) "Determinants of Car Ownership in Rural and Urban Areas: A Pseudo-Panel Analysis", *Transportation Research Part E*, 38, pp. 351-366.

Dargay J. (2005) "Choice of Commuting Model: a Panel Data Analysis", Transport Studies Unit, Oxford Centre for the Environment, Working Paper No. 1008; Paper presented at the 8th NECTAR conference, Las Palmas, G.C. June 2-4th 2005.

Dargay, J. and Gately, D. (1997) "Vehicle ownership to 2015: implications for energy use and emissions" *Energy Policy*. 25 (14-15) pp.1121-1127.

Davis, M. (2006) *City of Quartz: Excavating the Future in Los Angeles*, London: Verso.

Dean, H. (2003) 'Welfare, identity and the life course' in Baldock, J., Manning, N., and Vickerstaff, S., (eds.) *Social policy*, Oxford: Oxford University Press, pp. 194-230.

DCLG (Department of Communities and Local Government) (2007) *Homes for the Future: More affordable, more sustainable*, London: Department of Communities and Local Government

Department for Environment, Food and Rural Affairs (DEFRA) (2005) *The UK Government Sustainable Development Strategy*, London: DEFRA.

DETR (1998a) *The Use of Density in Urban Planning*, London: HMSO.

DETR (1998b) White Paper *A New Deal for Transport: Better for everyone*. London: HMSO.

DETR (1999) *Towards An Urban Renaissance: Final Report of the Urban Task Force, Chaired by Lord Rogers of Riverside*, London: Department of the Environment, Transport and the Regions.

DETR (2000) *Encouraging Walking: Advice to Local Authorities*. London: HMSO.

DETR (2000a) *Transport 2010: The 10-Year Plan*, London: DETR.

DETR (2000b) *Our Towns and Cities: The Future - Delivering an Urban Renaissance*, White Paper Cm 4911 London: HMSO.

DETR (2000c) *Social Exclusion and the Provision and Availability of Public Transport*, London: DETR.

Department of Transport (DoT) (1989), *Roads for Prosperity*, London: HMSO.

Department of Transport (DoT) (1996a) *Developing a Strategy for Walking*, London: HMSO.

Department of Transport (1996b) *The National Cycling Strategy*, London: HMSO.

DfT/DCLG, 2007, *Manual for Streets*, London: HMSO.

Department of Health (2005) *Choosing Activity: A physical activity action plan* London: Department of Health.

DETR (Department of the Environment, Transport and the Regions) (2000) "Encouraging walking: advice to local authorities", Department of the Environment, Transport and the Regions: London.

de Vaus, D. A. (2002) *Analyzing Social Science Data*, London : Sage.

DfT (2007) *Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World*, London: DfT.

DfT (2008a) "Tackling congestion on our roads - managing demand" at <http://www.dft.gov.uk/pgr/roads/introto roads/roadcongestion/>, accessed 19th February 2010.

DfT (2008b) *The Government Response to the King Review of Low-Carbon Cars*, London: DfT.

DfT (2008c) *Delivering a Sustainable Transport System*, London: DfT.

DfT (Department for Transport) (2006a) *Focus on Personal Travel (2005 Edition)* London: The Stationery Office.

DfT (Department for Transport) (2006b) *Transport Trends (2005 Edition)* London: The Stationery Office.

DfT (Department for Transport) (2006c) *Accessibility Planning Guidance*, London: The Stationery Office.

Dieleman, F.M., Dijst, M. and Burghouwt, G. (2002) "Urban form and travel behaviour: micro-level household attributes and travel behaviour" *Urban Studies* 39(3) pp. 507-527.

Dimeo, F., Bauer, M., Varahram, I., Proest, G. and Halter, U. (2001) "Benefits from aerobic exercise in patients with major depression: a pilot study" *British Journal of Sports Medicine* 35 (2) pp.114-117.

Docherty, I. (2003) "Policy, politics and sustainable transport: the nature of Labour's dilemma" from Docherty, I. and Shaw, J. (Eds.) (2003) *A New Deal for Transport?* Oxford: Blackwell.

Docherty, I., Shaw, J. and Gray, D. (2007) "Transport strategy in Scotland since devolution", *Public Money and Management* 27 (2) pp.141-148.

Docherty, I., Giuliano, G. and Houston, D. (2008) "Connected Cities", in Knowles, R., Shaw, J. and Docherty, I. (Eds.) *Transport Geographies: Mobilities, Flows and Spaces*, Oxford: Blackwell Publishing.

Dougherty, C. (2002) *Introduction to Econometrics (Second Edition)*. Oxford: Oxford University Press.

Downs, A. (2004) *Still Stuck in Traffic*, Washington: Brookings Institution Press.

Dudleston, A. Hewitt, E. Stradling, S. and Anable, J. (2005). Public Perceptions of Travel Awareness - Phase Three. Scottish Executive Research Unit. <http://www.scotland.gov.uk/Publications/2005/08/0193550/35513>, accessed 19th February 2010.

Dudley, G. and Richardson, J. (2001) *Why Does Policy Change? Lessons from British Transport Policy, 1945-1999*, London: Routledge.

Duffy, K. (1995), *Social Exclusion and Human Dignity in Europe*, Strasbourg: Council of Europe.

Eddington, R. (2006) *Transport's Role in Sustaining the UK's Productivity and Competitiveness*, London: TSO (The Stationery Office).

Ekelund, U., Griffin, J., Wareham, N.J. (2007) "Physical activity and metabolic risk in individuals with a family history of type 2 diabetes", *Diabetes Care*, 30 (2).

Ellaway, A., Macintyre, S., Hiscock, R. and Kearns, A. (2003) "In the driving seat: psychosocial benefits from private motor vehicle transport compared to public transport", *Transportation Research Part F: Traffic Psychology and Behaviour*, 6 (3), pp.217-231.

Ellaway, A., Macintyre, S. and McKay, L. (2003) "The historical specificity of early life car ownership as an indicator of socio-economic position" *Journal of Epidemiology and Community Health*, 57 pp.273-278.

Erling, H. and Norland, I.T. (2005) "Three challenges for the compact city as a sustainable urban form: household consumption of energy and transport in eight residential areas in the Greater Oslo Region", *Urban Studies*, 42 (12), pp.2145-2166.

EC (European Commission) (2001) *European Transport Policy for 2020: Time to Decide*, COM (2001) 0370, Luxembourg: Office for Official Publications of the European Communities.

EC (2006) *Keep Europe moving - Sustainable mobility for our continent, Mid-term review of the European Commission's 2001 Transport White Paper*, Luxembourg: Office for Official Publications of the European Communities.

http://ec.europa.eu/transport/transport_policy_review/index_en.htm, accessed 19th February 2010.

Experian (2004) *Mosaic United Kingdom: A Guide to UK Consumers*, London: Experian Ltd.

Farrington, J., Gray, D. and Martin, S. (1997) "Rural car dependence and the rising costs of car use" *Town and Country Planning* 66 (7-8) pp.214-216.

Farrington, J., Gray, D., Roberts, D., and Martin, S. (1998) *Car Dependence in Rural Scotland. Development Department Research Programme Research Findings No 53*. Edinburgh: The Scottish Office.

Field, A. (2000) *Discovering Statistics Using SPSS for Windows*. London: Sage.

Fielding, N., 'Qualitative Interviewing' in Gilbert, N. (Ed.) (1993) *Researching Social Life*, London: Sage, pp. 135-154.

Finch, H. and Lewis, J. (2003) 'Focus Groups' from Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice*, London: Sage.

Fincher, R. and Iveson, K. (2008) *Planning and Diversity in the City: Redistribution, Recognition and Encounter*, Basingstoke: Palgrave MacMillan.

Fischer, F., and Forester, J. (1993) "Editor's introduction" *The Argumentative Turn in Policy Analysis*, Durham/London: Duke University Press.

Flanagan, W. (1993) *Contemporary Urban Sociology*, Cambridge: University of Cambridge Press.

Flew, A. (Ed) (1983) *A Dictionary of Philosophy*. London: MacMillan Press.

Flick, U. (1998) *An Introduction to Qualitative Research*, London: Sage.

Fukuyama, F. (1997) "Social capital and the modern capitalist economy: creating a high trust workplace" *Stern Business Magazine* Vol. 4 No.1.

Gaffron, P., Hine, J. and Mitchell, F. (2001), *The Role of Transport in Social Exclusion: A Review of the Literature*, Central Research Unit.

Gans, H.J. (1962) *The Urban Villagers: Group and class in the life of Italian-Americans*, New York: Free Press of Glencoe.

Gans, H.J. (1991) *People, Plans, and Policies*, Chichester: Columbia University Press.

Gartman, D. (2004) "Three ages of the automobile: the cultural logics of the car" *Theory, Culture and Society* 21 (4-5) pp.169-195.

Gaunt, M., Rye, T. and Allen, S. (2007) "Public acceptability of road user charging: the case of Edinburgh and the 2005 referendum" *Transport Reviews* 27 pp 85-102.

George, V. and Wilding, P. (1999) *British Society and Social Welfare: Towards a sustainable society*, Basingstoke : Macmillan.

Geurs, K.T. and van Wee, B. (2006) "Ex-post evaluation of thirty years of compact urban development in the Netherlands" *Urban Studies* 43 (139) pp.139-160.

Gibson, M., Thomson, H., Petticrew, M., Kearns, A. (2008) *Health and Housing in the SHARP study: Qualitative Research Findings*, Edinburgh: Scottish Government Social Research.

Giddens, A. (2006) *Sociology (Fifth Edition)*, Cambridge: Polity Press.

Giddings, B., Hopwood, B., Melor, M. and O'Brien, G. (2005) "Back to the city: a route to urban sustainability" in Jenks, M. and Burgess, R. (Eds) *The Compact City Debate: A global perspective*, London: E & FN Spon.

Gilbert, N. (Ed.) (1993) *Researching Social Life*, London: Sage.

Girardet, H. (2006) *Creating Sustainable Cities (Schumacher Briefing #2)*, Devon, UK: Green Books.

Goodwin, P., Hallet, S., Kenny, F. and Stokes, G. (1991) *Transport: The New Realism* Oxford: University of Oxford Transport Studies Unit.

Goodwin, P. (1999) "Transformation of transport policy in Great Britain" *Transportation Research Part A*. 33 pp.655-669.

Gordon, D. (2006) "The concept and measurement of poverty" from Pantazis, C., Gordon, D., and Levitas, R. (Eds.) (2006) *Poverty and Social Exclusion in Britain: The millennium survey*, Bristol: The Policy Press.

Gordon, D. and Pantazis, C. (1997) *Breadline Britain in the 1990s*, Aldershot: Ashgate.

Gordon, D., Adleman, L., Ashworth, K., Bradshaw, J., Levitas, R., Middleton, S., Pantazis, C., Patsios, D., Payne, S., Townsend, P., and Williams, J. (2000) *Poverty and Social Exclusion in Britain*, York: Joseph Rowntree Foundation.

Gottdiener, M. 1985. *The Social Production of Urban Space*, Austin : University of Texas Press.

Gottdiener, M., and Budd, L. (2005) *Key Concepts in Urban Studies*, London: Sage.

Granovetter, M. (1973) "The Strength of Weak Ties" *American Journal of Sociology*, 78:6, pp.1360-1380.

Grant-Muller, S. and Laird, J. (2006) "Costs of Congestion: A literature-based review of methodologies and analytical approaches" Edinburgh: Scottish Executive Transport Research Findings No.1/ 2006, available at [<http://www.scotland.gov.uk/Publications/2006/11/01103423/1>].

Gray, J. (2000) "Inclusion: a radical critique" in Askonas, P. and Stewart, S. *Social Inclusion: Possibilities and Tensions*, Basingstoke: MacMillan Press.

Gray, D., Farrington, J., Shaw, J., Martin, S. and Roberts, D. (2001) "Car dependence in rural Scotland: transport policy, devolution and the impact of the fuel duty escalator", *Journal of Rural Studies* 17, pp.113-25.

Gray, D. Shaw, J., and Farrington, J. (2006) "Community transport, social capital and social exclusion in rural areas", *Area*, 38, pp.89-98.

Gray, D., Farrington, J., and Kagermeier, A. (2008) "Geographies of rural transport" in Knowles, R., Shaw, J., and Docherty, I. (2008) *Transport Geographies*, Oxford: Blackwell.

Greene, J., Caracelli, V.J., & Graham, W.F. (1989). Towards a conceptual framework for mixed-method evaluation designs. *Education, Evaluation and Policy Analysis*, 11(3), 255-274, in Brannen (*op.cit.*).

Greene, W.H. (2003) *Econometric Analysis (Fifth Edition)*, New Jersey: Pearson Education Ltd.

Greenman, J.V. (1996) "The car park: diffusion models revisited", *Energy Economics*. 18 pp.107-128.

Grieco, M. Turner, J. and Hine, J. (2000) "Transport, employment and social exclusion", *Local Work*, 26.

Gujarati, D.N. (2003) *Basic Econometrics (Fourth Edition; International Edition)*. London: McGraw Hill.

Hall, P. (2001) "Sustainable cities or town cramming" from Layard, A., Davoudi, S. and Batty, S. (Eds) *Planning for a Sustainable Future*, London: Spon Press.

Handy, S. (1996) "Methodologies for Exploring the link between Urban Form and Travel Behaviour", *Transport Research Part D*, 1(2) pp. 151-165.

Handy, H. Cao, X., and Mokhtarian, P.I. (2006)"Self-Selection in the Relationship between Built Environment and Walking", *Journal of the American Planning Association*, Winter 2006, 72 (1) pp 55-74.

Hanley, M. and Dargay, J.M. (2000) *Car Ownership in Great Britain - A panel data analysis*, ESRC Transport Studies Unit, University College.

Hanson, S. (2004) "The context of urban travel: concepts and recent trends" from Hanson, S. and Giuliano, G. (Eds), *The Geography of Urban Transportation (Third Edition)*, London: The Guilford Press.

Haraway, D.J. (1991) *Simians, Cyborgs and Women: the Reinvention of Nature*, London: Free Association.

Harvey, D. (2000) *Spaces of Hope*, Edinburgh: Edinburgh University Press.

Hathaway, T. (2000) "Planning local movement systems" in Barton, H. (Ed.) (2000) *Sustainable Communities*. London: Earthscan.

Hillman, M. (1996) "In favour of the compact city" from Jenks, M., Burton, E. and Williams, K. (Eds) (1996) *The Compact City: A Sustainable Urban Form?* London: E & F.N. Spon.

Hills, J., LeGrand, J. and Piachaud, D. (Eds) (2002) *Understanding Social Exclusion*, Oxford: Oxford University Press.

Hine, J. and Grieco, M. (2003) "Scatters and clusters in time and space: implications for delivering integrated and inclusive transport" *Transport Policy* 10.

Hine, J. and Mitchell, F. (2001) "Better for everyone? Travel experiences and transport exclusion" *Urban Studies* 38(2) pp.319-332.

Hine, J. and Mitchell, F. (2003) *Transport Disadvantage and Social Exclusion: Exclusionary mechanisms in transport in urban Scotland*, Aldershot: Ashgate.

Hiscock, R., Macintyre, S., Kearns, A. and Ellaway, A. (2002) "Means of transport and ontological security: do cars provide psycho-social benefits to their users?" *Transportation Research Part D* (7) pp.119-135.

Jabareen, Y.R. (2006) 'Sustainable Urban Forms: Their Typologies, Models, and Concepts', *Journal of Planning Education and Research*, Vol. 26, No. 1, pp.38-52.

Jaccard, J. (2001) *Interaction Effects in Logistic Regression*, Thousand Oaks, CA: Sage.

Jacobs, J. (1961) *The Death and Life of Great American Cities*. London: Penguin Books.

Jenks, M., Burton, E. and Williams, K. (1996a) "Compact cities and sustainability: an introduction" in Jenks, M., Burton, E. and Williams, K. (Eds.) (1996) *The Compact City: A Sustainable Urban Form?* London: E & F.N. Spon.

Jenks, M., Burton, E. and Williams, K. (Eds.) (1996b) *The Compact City: A Sustainable Urban Form?* London: E & F.N. Spon.

Jenks, M. and Dempsey, N. (2005) "The language and meaning of density" in Jenks, M. and Dempsey, N., (Eds.) (2005) *Future Forms and Design for Sustainable Cities*, Architectural Press, Elsevier, Oxford.

Kahn, R. and Cannell, C. (1957) *The Dynamics of Interviewing*, New York: John Wiley.

Kearns, A., Ellaway, A., Macintyre, S., and Hiscock, R. (2000) *The THAW Report: findings of a study of transport, housing and well-being in the West of Scotland*. Glasgow: Department of Urban Studies, University of Glasgow and MRC Social and Public Health Sciences Unit.

Kennedy, P. (2003) *A Guide to Econometrics (Fifth Edition)*. Oxford: Blackwell.

Kelle, U. (2005) "Mixed methods as a way to overcome methodological limitations of qualitative and quantitative research" Paper presented at the ESRC conference "Mixed methods - identifying the issues", University of Manchester 26-27 October 2005.

Kenworthy, J.R. and Laube, F.B. (1999) "Patterns of automobile dependence in cities: an international overview of key physical and economic dimensions with some implications for urban policy." *Transportation Research Part A* 33 pp.691-723.

Kenyon, S., Lyons, G. and Rafferty, J. (2002) 'Transport and Social Exclusion: Investigating the Possibility of Promoting Inclusion Through Virtual Mobility.' *Journal of Transport Geography* 10:3) pp.207-219.

Kitamura, R. Mokhtarian, P.L. and Laidet, L. 1997 "A Micro-Analysis of land use and travel in five neighbourhoods in the San Francisco Bay Area", *Transportation* No.24 pp. 125-158.

Knowles, R. & White, P. (2003) 'Light Rail and the London Underground', in Docherty, I. & Shaw, J. (eds.) *A New Deal for Transport?*, Oxford: Blackwell.

Kristensen, H. (1995) "Social exclusion and spatial stress: the connections" in Room, G. (Ed.) (1995) *Beyond the Threshold: The Measurement and Analysis of Social Exclusion*, Bristol: The Policy Press.

Krizek, K.J. (2003) "Residential relocation and changes in urban travel: Does neighbourhood-scale urban form matter?" *Journal of the American Planning Association*, 69 pp.265-281.

Labour Party (1996) *Consensus for Change: Labour's transport strategy for the 21st Century*, London: The Labour Party.

Latour, B. (1987) *Science in Action*, Milton Keynes: Open University Press.

Lau, S., Wang, J., Giridharan, R., and Ganesan, S. (2005) "High-density high-rise and multiple and intensive land use in Hong Kong: a future city form for the new millennium" in Jenks, M. and Dempsey, N., (Eds.) *Future Forms and Design for Sustainable Cities*, Architectural Press, Elsevier, Oxford.

Lee, P. and Murie, A. (1999) *Literature Review of Social Exclusion*, Edinburgh: Central Research Unit.

Legard, R., Keegan, J. and Ward, K. (2003) "In-depth Interviews" in Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice*, London: Sage.

Levitas, R. (1998) *The inclusive Society? Social exclusion and New Labour* Basingstoke: MacMillan.

Levitas, R. (2000) "What is social exclusion?" in Gordon, D. and Townsend, P. (Eds.) *Breadline Europe: The measurement of poverty*, Bristol: The Policy Press.

Levitas, R. (2005) *The Inclusive Society?: Social Exclusion and New Labour*, Basingstoke: Palgrave Macmillan.

Levitas, R. (2006) "The concept and measurement of social exclusion" from Pantazis, C., Gordon, D., and Levitas, R. (Eds.) *Poverty and Social Exclusion in Britain: The millennium survey*, Bristol: The Policy Press.

Levitas, R., Pantazis, C., Fahmy, E., Gordon, D., Lloyd, E., and Patsios, D. (2007) *The Multi-Dimensional Analysis of Social Exclusion*, Report funded by DCLG and SEU, London: The Social Exclusion Task Force.

Lewis, J. (2003) "Design Issues" from Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice: A guide for social science students*. London: Sage.

Lewis, J. and Ritchie, J. (2003) "Generalising from Qualitative Research" from Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice: A guide for social science students*. London: Sage.

Liddiard, M. (2003) 'Social Need and Patterns of Inequality and Difference' in Baldock, J., Manning, N., and Vickerstaff, S., (Eds.) *Social policy*, Oxford: Oxford University Press, pp.110-133.

Lister, R. (2000) "Strategies for social inclusion: promoting social cohesion or social justice?" in Askonas, P. and Stewart, A. (Eds.), *Social Inclusion: possibilities and tensions*, Basingstoke: MacMillan Press Ltd.

Litman, T., (2003) "Measuring Transportation: Traffic, Mobility and Accessibility," Institute of Transportation Engineers *ITE Journal* (www.ite.org), Vol. 73, No. 10, pp. 28-32.

Litman, T. (2005) "Accessibility: defining, evaluating and improving accessibility" Victoria Transport Policy Institute at (<http://www.vtpi.org/tdm/tdm84.htm>, accessed 19th February 2010.)

Litman, T. (2010) *Parking Pricing Implementation Guidelines: How more efficient parking pricing can help solve parking and traffic problems, increase revenue and achieve other planning objectives*, Victoria, Canada: VTPI.

Livingston, M., Bailey, N. and Kearns, A. (2008) "People's attachment to place - the influence of neighbourhood deprivation" York: Chartered Institute of Housing/ Joseph Rowntree Foundation.

Long, J.S. (1997) *Regression Models for Categorical and Limited Dependent Variables (Advanced Quantitative Techniques in the Social Science Series)*. London: Sage.

Lucas, K. (2004) "Locating transport as a social policy problem" from Lucas, K. (Ed) (2004) *Running on Empty: transport, social exclusion and environmental justice*, Bristol: The Policy Press.

Lupton. R. (2003) *Poverty Street: The dynamics of neighbourhood decline and renewal* (CASE studies on poverty, place and policy), Bristol: The Policy Press.

Lyons, G. (2003) "The introduction of social exclusion into the field of travel behaviour", *Transport Policy* 10 pp.339-342.

Lyons, G. and Urry, J. (2005) "Travel time use in the information age", *Transportation Research Part A*, 39 pp. 225-276.

Mack, J. and Lansley, S. (1985) *Poor Britain*, London: Allen and Unwin.

MacDonald, M. (2008) *The Role of Taxis in Rural Public Transport: Final report*. London: CfIT.

McKinnon, A. (2003) "Sustainable freight distribution" in Hine, J. and Preston, J. (2003) *Integrated futures and transport choices: UK transport policy beyond the 1998 white paper and transport acts*, Aldershot: Ashgate.

MacKinnon, D. and Vigar, G. (2008) "Devolution and the UK's new transport policy landscape" in Docherty, I. and Shaw, J. (Eds.) *Traffic Jam: Ten years of 'sustainable' transport in the UK*, Bristol: The Policy Press.

Maddala, G.S. (2001) *Introduction to Econometrics (Third Edition)*. Chichester: John Wiley and Sons.

Mandipour, A., Cars, G., Allen, J. (Eds.) (1998) *Social Exclusion in European Cities: Processes, experiences and responses*, London: Stationery Office/ Regional Studies Association.

Manzi, T. and Smith-Bowers, B. (2006) "Gated communities as club goods: segregation or social cohesion?" in Atkinson, R. and Blandy, S. (Eds) *Gated Communities*, Abingdon: Routledge.

Marshall, C. and Rossman, G. B. (1999) *Designing Qualitative Research, (Third Edition)*, London, Sage.

Marshall, S. (2005) *Streets and Patterns*, London: Spon Press.

Mason, J. (2002) *Qualitative Researching (Second Edition)*, London: Sage.

Menard, S. (1995) *Applied Logistic Regression Analysis (Sage University Paper Series on Quantitative Applications in the Social Sciences, series no 07-106)*, London: Sage

Miller, D. (2001) "Driven societies" in Miller, D. (Ed)(2001) *Car Cultures*, Oxford: Berg.

Mokhtarian, P. L. & Salomon, I. (2001) "How derived is the demand for travel? Some conceptual and measurement considerations," *Transportation Research Part A: Policy and Practice*, 35(8), pp. 695-71.

Mokhtarian, P.L. (2004) "Travel as a desired end, not just a means", *Transportation Research Part A*, 39 pp.93-96.

Mooney, G. (1999) "Urban 'Disorders'" in Pile, S., Mooney, G. and Brook, C. (Eds), *Unruly Cities?: Order/ Disorder*, London: Routledge.

Moore, D. S. and McCabe, G. P. (2003) *Introduction to the Practice of Statistics (Fourth Edition)*. New York: W.H.Freeman and Company.

Munshi, K. (1993) "Urban passenger travel demand estimation: A household activity approach", *Transportation Research Part A: Policy and Practice*, 27(6), pp.423-432.

Muller, P. O., (2004) "Transportation and Urban Form: Stages in the Spatial Evolution of the American Metropolis" from Hanson, S. and Giuliano, G. (Eds), *The Geography of Urban Transportation (Third Edition)*, London: The Guilford Press.

Mumford, L. (1937) cited in Pile, S. (1999) "What is a city?" from Massey, D. B., Allen, J. and Pile, S. (Eds) *City Worlds*, London: Routledge/Open University.

Mumford, L. (1961) *The City in History: Its Origins, Its Transformations, and Its Prospects*, New York: Peregrine Editions.

Newman, P. and Kenworthy, J., (1989) *Cities and Automobile Dependence: An International Sourcebook*, Aldershot: Gower.

Newman, P. and Kenworthy, J., (1999) *Sustainability and Cities: Overcoming Automobile Dependence*, Island Press, Washington DC, 1999.

Newman, P. (1992) "The compact city - an Australian perspective", *Built Environment*, **18**(4): 285-300.

Nussbaum, M.C. (1988) "Nature, function and capability: Aristotle on Political Distribution", *Oxford Studies in Ancient Philosophy*, Supplement pp.145-184.

O'Brien, L. (1992) *Introducing Quantitative Geography: measurement, methods and generalised linear models*, London: Routledge.

O'Campo, P., Salmon, C. and Burke, J. (2009) "Neighbourhoods and mental well-being: what are the pathways?" *Health and Place*, **15** (1) pp.56-58.

ODPM (Office of the Deputy Prime Minister) (2003) *Sustainable Communities: Building for the Future*, London: ODPM

Office for National Statistics (ONS) (2001) Access to Local Services, Office for National Statistics
<http://www.statistics.gov.uk/CCI/nugget.asp?ID=64&Pos=2&ColRank=2&Rank=1000>, accessed 9th April 2010.

Office for National Statistics (ONS) (2006) *Social Trends 36*, Basingstoke: Palgrave MacMillan.

Ogilvie, D. B. (2007) *Shifting Towards Healthier Transport? From Systematic Review to Primary Research* [Ph.D] MRC Social and Public Health Sciences Unit. Glasgow: University of Glasgow.

Oppenheim, A. N. (1999) *Questionnaire Design, Interviewing and Attitude Measurement*. London: Continuum.

Pallant, J. (2001) *SPSS Survival Manual: A step by step guide to data analysis using SPSS for Windows*, Buckingham: Open University Press

Pantazis, C., Gordon, D. and Townsend, P. (2006) "The necessities of life" from Pantazis, C., Gordon, D., and Levitas, R. (Eds.) *Poverty and Social Exclusion in Britain: The millennium survey*, Bristol: The Policy Press.

Park, R.E., Burgess, E.W. and McKenzie, R.D.. (1967) *The City*, Chicago: Chicago University Press.

Parkhurst, G. and Dudley, G. (2008) "Roads and traffic: from 'predict and provide' to 'making best use'" in Docherty, I. and Shaw, J. (Eds) *Traffic Jam: Ten years of 'sustainable' transport in the UK*. Bristol: The Policy Press.

Percy-Smith, J. (2000) *Policy Responses to Social Exclusion: Towards inclusion?* Buckingham: Open University Press.

Perrett, K. E., Hopkin, J.M., Pickett, M. and Walmsley, D. (1989) *The effect of bus deregulation in the metropolitan areas*, Crowthorne: Transport and Road Research Laboratory.

Pierson, C. (1998) "Theory in British Social Policy" from Ellison, N. and Pierson, C. (Eds.) *Developments in British Social Policy* 218-232.

Piachaud, D. and Sutherland, H. (2002) "Child Poverty" in Hills, J., LeGrand, J. and Piachaud, D. (Eds) (2002) *Understanding Social Exclusion*, Oxford: Oxford University Press.

Pickering, A. (1995) *The Mangle of Practice: Time, agency and science*, University of Chicago Press.

Pickup, L. (1989) *Women's travel requirements: employment, with domestic constraints*, in Grieco, M., Pickup, L. and Whipp, R. (1989) *Gender, Transport and Employment, the impact of travel constraints*, Aldershot: Gower.

Pile, S. (1999) "What is a city?" from Massey, D. B., Allen, J. and Pile, S. (Eds) *City Worlds*, London: Routledge/Open University.

Pole, C.J. and Lampard, R. (2002) *Practical Social Investigation: Qualitative and Quantitative Methods in Social Research*, Essex: Pearson Education Limited.

Pope, C. and Mays, N. (1995) "Qualitative Research: Reaching the parts other methods cannot reach", *British Medical Journal*, 311, pp.42-45.

Pryce, G. (2004) *Advanced Regression in SPSS*. Glasgow: University of Glasgow.

Pryce, G. (2005) *Inference and Statistics in SPSS: A Course for Business and Social Science*, Glasgow: GeeBeeJey Publishing.

Pucher, J. (2002) "Renaissance of public transport in the United States?" *Transportation Quarterly*, 56 (1) pp. 33-49.

Pucher, J.R. and LeFevre, C. (1996) *The Urban Transport Crisis in Europe and North America*, Houndmills: MacMillan Press.

Putnam, R.D. (1995) "Bowling Alone" from LeGates, R.T. and Stout, F. (Eds) *The City Reader (Third Edition)*. London: Routledge.

Putnam, R.D. (2000) *Bowling Alone: The collapse and revival of American community*, New York: Simon and Schuster.

Reid, D. (1995) *Sustainable Development: An introductory guide* London: Earthscan.

Rein, M. and Schön, D. (1993) "Reframing Policy Discourse" in Fischer, F., and Forester, J. (1993) *The Argumentative Turn in Policy Analysis*, Durham/London: Duke University Press.

Rio Declaration on Environment and Development, made at United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 3-14 June 1992, 31 ILM 874 (1992), New York: United Nations Department of Public Information.

Ritchie, J., (2003) "The Applications of Qualitative Methods to Social Research" from Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice: A guide for social science students*. London: Sage.

Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice: A guide for social science students*. London: Sage.

Ritchie, J., Lewis, J., and Elam, G. (2003) 'Designing and Selecting Samples' in Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice: A guide for social science students*. London: Sage.

Roberts, P. (2000) "The evolution, definition and purpose of urban regeneration" from Roberts, P. and Sykes, H. (Eds.) *Urban Regeneration: a handbook*, London: Sage.

Roberts, B. (2002) *Biographical Research*, Buckingham, Oxford University Press.

Robeyns, I. (2006) "The Capability Approach in practice" *The Journal of Political Philosophy*, 14(3) pp.351-376.

Rodrigue, J.-P., Comtois, C. and Slack, B. (2006) *The Geography of Transport Systems*, London: Routledge.

Romilly, P. (1999) "Substitution of Bus for Car Travel in Urban Britain: An economic evaluation of bus and car exhaust emission and other costs" *Transportation Research Part D*, 4 pp.109-125.

Room, G. (Ed.) (1995) *Beyond the Threshold: The Measurement and Analysis of Social Exclusion*, Bristol: The Policy Press.

Royal Commission on Environmental Pollution (RCEP) (1994). *Eighteenth*

Report -Transport and the Environment, The Stationery Office, London.

SACTRA (Standing Advisory Committee on Trunk Road Assessment) (1994) *Trunk Roads and the Generation of Traffic*, London: HMSO.

Saunders, P. (2003) *Can Social exclusion provide a new framework for measuring poverty?* Social Policy Research Centre Discussion Paper No. 127, Sidney, Australia: SPRC.

Schaeffer, A. and Sclar, E. (1975) *Access for All: Transportation and Urban Growth*, London: Penguin.

Schoon, N. (2001) *The Chosen City*, London: Spon Press.

SG (Scottish Government) (2008) *National Planning Framework*, Edinburgh: Scottish Government.

The Scottish Office (1998) *Travel Choices for Scotland: The Scottish Integrated Transport White Paper*, Edinburgh: Scottish Office.

Scottish Planning Policy Guideline: SPP 17, *Planning For Transport* (2005), Edinburgh: The Scottish Executive.

Schwanen, T. Dijst, M. and Dieleman, F.M.(2004) "Policies for urban form and their impact on travel: the Netherlands experience", *Urban Studies*, Vol.41(3), pp.579-603.

Schwanen, T. and Mokhtarian, P.L. (2005) "What if you live in the wrong neighborhood? The impact of residential neighbourhood type dissonance on distance travelled", *Transportation Research Part D*, Vol. 10, pp.127-151.

SE (Scottish Executive) (1999) *Social Justice: A Scotland where everyone matters*, Edinburgh: Scottish Executive.

SE (Scottish Executive) (2003) *Improving Health in Scotland: The challenge* Edinburgh: Scottish Executive.

Seale, C. (1999) *The Quality of Qualitative Research*. London: Sage

Searle, J.R. (1996) *The Construction of Social Reality*, London: Penguin
Select Committee on Education and Employment (1998) *Education and Employment -7th report: Overcoming Barriers to paid employment for lone parents*, [online]: Available: <http://www.parliament.the-stationery-office.co.uk/pa/cm199798/cmselect/cmduemp/646/64602.htm> [Accessed 2nd November 1999].

Sen, A. (1980) 'Equality of what?' in *The Tanner Lectures on Human Values*, ed. McMurrin, S., Cambridge: Cambridge University Press.

Sen, A. (1985) *Commodities and Capabilities* Oxford: Elsevier Science.

- Sen, A. (1987) 'The Standard of Living', in *The Standard of Living*, ed. Hawthorn, G., Cambridge: Cambridge University Press.
- Sen, A. (2000) *Social Exclusion: Concept, Application, and Scrutiny*, Manila: Office of Environment and Social Development, Asian Development Bank.
- Sen, A. (2004) 'Capabilities, Lists, and Public Reason: Continuing the Conversation', *Feminist Economics* 10(3), pp. 77-80.
- Senior, N.L., Webster, C .J., and Blank, N.E. (2006) "Residential Relocation and sustainable urban form: statistical analyses of owner-occupiers' preferences", *International Planning Studies*, 11(1), pp.41-57.
- Sennett, R. (1970) *The Uses of Disorder: Personal Identity and City Life*, New York: Knopf.
- SEU (Social Exclusion Unit) (2001) *A New Commitment to Neighbourhood Renewal: National strategy action plan*, London: Social Exclusion Unit.
- SEU (Social Exclusion Unit) (2003) *Making the Connections: Final report on transport and social exclusion*, London: SEU.
- Shaw, M., Dorling, D., Gordon, D., and Smith, G. (1999) *The Widening Gap: Health inequalities and policy in Britain*, Bristol: The Policy Press.
- Shaw, J. and Walton, W. (2001) "Labour's new trunk roads policy for England: an emerging pragmatic multimodalism?" *Environment and Planning A*, 33 pp.1031-1056.
- Sheller, M. (2004) "Automotive emotions" *Theory, Culture and Society* 21 (4/5) pp.221-242.
- Sheller, M. and Urry, J. (2006) "The new mobilities paradigm" *Environment and Planning A* 38 pp.207-226.
- Short, J.R. (2006) *Urban Theory: a critical assessment*, Basingstoke: Palgrave Macmillan.
- Silver, H. (1995) "Reconceptualising Social Disadvantage: Three paradigms of social exclusion" in Rodgers, G., Gore, C. and Figueiredo, J. (Eds.) *Social Exclusion: Rhetoric, Reality, Responses*, Geneva, International Institute for Labour Studies.
- Silver, H. (1994) "Social Exclusion and Social Solidarity: Three paradigms", *International Labour Review* 133, pp.531-78
- Silver, H. and Miller, S.M. (2003) 'Social Exclusion: the European Approach to Social Disadvantage', *Indicators* 2(2): 1-17.

Silverman, D. (Ed) (1997) *Qualitative Research: Theory, method and practice*, London: Sage.

Simmel, G. (1950) *The Sociology of Georg Simmel* (Translated, edited, and with an introduction by Kurt H. Wolff), London: Collier-Macmillan.

Sinclair, P. and Sinclair, F. (2001) 'Access All Areas?: An Assessment Of Social Inclusion Measures In Scottish Local Transport Strategies', Edinburgh: CRSIS.

Sloman, L. (2006) *Car Sick: Solutions for Our Car-addicted Culture*, Totnes: Green Books.

Smith, N., (1996) *The New Urban Frontier: Gentrification and the Revanchist City*, London: Routledge.

Snape, D. and Spencer, L. (2003) "The Foundations of Qualitative Research" from Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice: A guide for social science students*, London: Sage.

SEU (Social Exclusion Unit) (2001) *A New Commitment to Neighbourhood Renewal: National Strategy Action Plan - Report by the Social Exclusion Unit*, London: SEU.

Sparkes, J. and Glennerster, H. (2002) "Preventing Social Exclusion: Education's Contribution" in Hills, J., LeGrand, J. and Piachaud, D. (Eds.) (2002) *Understanding Social Exclusion*, Oxford: Oxford University Press.

Stake, R. E. (1995) *The Art of Case Study Research*, Thousand Oaks, CA: Sage.

Stake, R. E. (2000) 'The Case Study Method in Social Inquiry', in Gomm, R., Hammersley M. and Foster P. (Eds.) *Case Study Method*. London: Sage.

Stake, R. E. (2005) 'Qualitative Case Studies' in Denzin, N. K. and Lincoln, Y. S. (Eds.) *The Sage Handbook of Qualitative Research (Third Edition)* Thousand Oaks, CA: Sage.

Steg, L. (2001) "The effects of motivational factors on car use: a multidisciplinary modelling approach", *Transportation Research Part A*. 35 pp.789-806.

Steg, L. (2005) "Car use: lust and must. Instrumental, symbolic and affective motives for car use", *Transportation Research Part A*, 39 pp.147-162.

Stern, N.H. (2006) *Stern Review on the Economics of Climate Change*. London: HMSO.

Stewart, A. (2000) "Never ending story: inclusion and exclusion in late modernity" in Askonas, P. and Stewart, S. *Social Inclusion: Possibilities and Tensions*, Basingstoke: MacMillan Press.

Stone, D. (2002) *Policy Paradox: The art of political decision making (Revised Edition)*, London: W.W. Norton.

Storper, M. and Manville, M. (2006) "Behaviour, Preferences and Cities: Urban Theory and Urban Resurgence." *Urban Studies*, 43:8 pp.1247-1274.

Stradling, S. (2003) "Reducing Car Dependence" from Hine, J. (Ed.) (2003) *Integrated Futures and Transport Choices: UK transport policy beyond the 1998 white paper and transport acts*, Aldershot: Ashgate.

Stradling, S.G. (2004a). 'Changing individual travel behaviour: From policy to perceived behavioural control', Proc. Symposium on Travel Psychology, 3rd International conference in Traffic and Transport Psychology, Nottingham, 5-9 September 2004.

Stradling, S.G. (2004b) "Readiness for modal shift in Scotland", *Scottish Geographical Journal*, 120(4) pp.265-275.

Stradling, S.G., Carreno, M., Ferguson, N., Rye, T., Halden, D., Davidson, P., Anable, J., Hope, S., Alder, B., Ryley, T. and Wigan, M. (2005), *Scottish Household Survey Analytical Topic Report: Accessibility and Transport, Research Findings No.209*, Scottish Executive Social Research, Edinburgh: Scottish Executive.

Stradling, S.G. (2006) *Moving Around: the Psychology of Transport*. Foresight Intelligent Infrastructure Project, state of research review, www.foresight.gov.uk. London: Department of Trade and Industry.

Stradling, S.G. and Anable, J. (2008) "Individual Travel Patterns", in Knowles, R., Shaw, J. and Docherty, I. (Eds.) *Transport Geographies: Mobilities, Flows and Spaces*, Oxford: Blackwell Publishing.

Stradling, S.G., Meadows, M.L., and Beatty, S. (2000) "Helping drivers out of their cars: integrating transport policy and social psychology", *Transport Policy* 7 (3) pp.207-215.

Stradling, S. G., Noble, A., Carreno., M., Jeffery, G. and Marshall, I. (2004), "Eight reasons people don't like buses". Proc. Symposium on Non-rational factors influencing travel mode, 3rd International conference in Traffic and Transport Psychology, Nottingham, 5-9 September 2004.

Strauss, A. and Corbin, J. (1990) *Basics of Qualitative Research: Grounded theory procedures and techniques*. London: Sage.

Stubbs, M. (2002) "Car parking and residential development: sustainability, design and planning policy, and public perceptions of parking provision", *Journal of Urban Design*. 7 (2) pp.213-237.

Tabachnick, B.G. and Fidell, L.S. (2001) *Using Multivariate Statistics (Fourth Edition)*. London: Allyn and Bacon.

Taylor, C. (1999) "Democratic Exclusion (and its remedies?)" in *Citizenship, Diversity, and Pluralism: Canadian and Comparative Perspectives*, Cairns, A.C. et al. (eds.) (1999) Montreal and Kingston: McGill-Queen's University Press, pp. 265-87.

Thomas, D. (2002) *Architecture and the Urban Environment*, London: Architectural Press.

Thomas, R. (1999) "Income - commentary" from Jenkinson, C. "Measuring Health Status and Quality of Life", 1998 Question Bank Topic Commentary on Health (available at <http://qb.soc.surrey.ac.uk/topics/health/jenkinson.htm>) [The Question Bank is an ESRC funded Internet social survey resource based in the Department of Sociology, University of Surrey] [Accessed 14th September 2005]

Thommen-Dombois, O., Braun-Fahrlander, C. and Martin-Diener, E. (2007) "Comparison of adult physical activity levels in three Swiss alpine communities with varying access to motorised transportation", *Health and Place*, January 2007.

Tierney (2000) in Stake, R. E. (2005) 'Qualitative Case Studies' in Denzin, N. K. and Lincoln, Y. S. (Eds.) *The Sage Handbook of Qualitative Research (Third Edition)* Thousand Oaks, CA: Sage pp. 443-466.

Tönnies, F. (1955) *Gemeinschaft und Gesellschaft - Community and Association* (translated and supplemented by Charles P. Loomis), London: Routledge & Kegan Paul.

Townsend, P. (1979) *Poverty in the United Kingdom, a Survey of Household Resources and Standards of Living*, London: Penguin Books and Allen Lane.

Turner, J. and Grieco, M. (2000) "The impact of transport investment projects upon the inner city: a literature review" *Time and Society* 9 (1) pp129-136.

Tunstall R. (2002) *Housing Density: What do residents think?* London: East Thames Housing Group.

Turton, B. and Knowles, R. (1992) "Urban transport problems and solutions" from Hoyle, B.S. and Knowles, R.D. (Eds) (1992) *Modern Transport Geography* London: Belhaven Press.

UTF (Urban Task Force) (2005) *Towards a Strong Urban Renaissance*. London: UTF.

United Nations (2002) *Report of the World Summit on Sustainable Development: Johannesburg, South Africa 26th August- 4th September*. New York: United Nations [*The Three Pillars of Sustainability*].

Urry, J. (1999) "Automobility, Car Culture and Weightless Travel: A discussion paper" Project SceneSusTech, Department of Sociology, Lancaster: Lancaster University.

Urry, J. (2000) *Sociology beyond Societies: Mobilities for the Twenty-first Century*, London: Routledge.

Urry, J. (2004) 'The "System" of Automobility', *Theory, Culture & Society* 21(4/5), pp.25-39.

Urry, J. (2004b) "Connections", *Environment and Planning D* 22, pp.27-37.

Urry, J. (2008) "Governance, flows, and the end of the car system?" *Global Environmental Change* 18 (2008) pp.343- 349.

Vigar, G. (2002) *The Politics of Mobility: Transport, the environment and public policy*. London: Spon Press.

Walker, A. (1995) 'The Dynamics of Poverty and Social Exclusion.' in Room, Graham (ed.). *Beyond the Threshold: The Measurement and Analysis of Social Exclusion*, Bristol: Polity Press.

Walker, A. (1997) 'Introduction: The Strategy of Inequality from Walker, A. and Walker, C. (Eds.) *Britain Divided: The Growth of Social Exclusion in the 1980s and 1990s*, London: Child Poverty Action Group.

Walker, D., Mitchell, G., Fairburn, J. and Smith, G. (2005) "Industrial pollution and social deprivation" *Local Environment*, 10 (4) pp. 361-377.

Walton, W. (2003) "Roads and traffic congestion policies" from Docherty, I. and Shaw, J. (Eds) (2003) *A New Deal for Transport?* Oxford: Blackwell.

WCED (World Commission on Environment and Development) (1987) *Our Common Future*, Oxford: Oxford University Press.

Weber, M. (1960) *The City* translated from the German and edited by Don Martindale and Gertrud Neuwirth, London: Heinemann.

Webster, B. (2005) "Will the first naked street make drivers slow down?" *The Times*, January 06 2005

Webster, D. (1999) "Targeted Local Jobs: The missing element in Labour's social inclusion policy", *New Economy*, 6 (4) 193-198.

Weinberg, S.L. and Abramowitz, S.K. (2008) *Statistics Using SPSS: An integrative approach (Second Edition)*, Cambridge: Cambridge University Press.

Welsh Office (1998) *Transporting Wales Into the Future*, London: Welsh Office.

Wengraf, T. (2001) *Qualitative Research Interviewing*, London: Sage.

WHO (World Health Organization) (1948) Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946, Official Records of the World Health Organization, no. 2, p. 100.

Whitehead, C. (2007), "Planning Policies and affordable housing: England as a successful case study?" *Housing Studies*, 22(1), pp.25-44.

Whitehead, C. (2008) *The Density Debate: A Personal View*, London: London School of Economics.

Whitelegg, J. (1994) *Transport for a Sustainable Future: the Case for Europe*, Chichester: John Wiley and Sons.

Williams, K., Burton, E., and Jenks, M. (2000) "Achieving sustainable urban form: conclusions" in Williams, K, Burton, E. and Jenks, M. (Eds) *Achieving Sustainable Urban Form*, London: E & F.N. Spon.

Williams, K. , Burton, E., and Jenks, M. (1996) "Achieving the compact city through intensification: an acceptable option? " in Jenks, M., Burton, E. and Williams, K. (Eds) (1996) *The Compact City: A Sustainable Urban Form?*, London: E & F.N. Spon.

Wirth, L. (1938) "Urbanism as a Way of Life" from LeGates, R.T. and Stout, F. (Eds) *The City Reader (Third Edition)*, London: Routledge.

Wirth, L. (1964) *On Cities and Social Life: Selected papers* (Ed. Reiss, A.J.), London: University of Chicago Press.

Yin, R.K. *Applications of Case Study Research (Applied Social Research Methods)* (2003), London: Sage.

Zhang, M. (2006) "Travel choice with no alternative: can land use reduce automobile dependence?" *Journal of Planning, Education and Research* 25, pp311-326.

Appendix 1: Essential Terms in Regression Analysis

R^2 : this is a figure between 0 and 1, known as the *coefficient of multiple determination*, which indicates the proportion of the variance in the dependent variable (y) is accounted for by the regression model. As such, it provides a measure of goodness of fit of the regression line to the observed data. The figure can be calculated as follows:

$$R^2 = \frac{SS_M}{SS_T}$$

Where:

SS_M = the model (or regression) sum of squares

SS_T = the total sum of squares

Adjusted R^2 (AR^2): the addition of other variables to the regression equation will increase the value of R^2 , regardless of any increase in the explanatory power of the model. The Adjusted R^2 figure attempts to correct for this by effectively imposing a penalty for each increase in the number of explanatory variables. The adjusted R^2 will increase with the addition of each new variable only when the absolute value of its t -statistic is greater than 1 (Dougherty, 2002).

F Test: This measures how much the model has improved the prediction of outcome compared to the level of inaccuracy in the model. If the model is good then the improvement in prediction due to the model will be large i.e. the mean squares for the model will be large and the residual mean squares will be small (Field, 2000).

$$F = \frac{MS_M}{MS_R}$$

Where:

MS_M = mean squares for the model

MS_R = residual mean squares

$$\text{i.e. } F = \frac{(RSS_R - RSS_U)/r}{RSS_U/(n-k-1)}$$

Where:

RSS_U = unrestricted residual sum of squares under H_0 of no relation between dependent and independent variables

RSS_R = unrestricted residual sum of squares under H_1 where coefficients explain some relation between dependent and independent variables

F Test procedure:

1. Compute RSS_U

2. Compute RSS_R

3. Calculate r and df_U

where:

r = the number of restrictions, equal to the difference between the restricted and unrestricted regressions

df_U = degrees of freedom of the residual

4. Substitute RSS_U , RSS_R , r and df_U in the equation above and calculate.

If the regression has had an invalid restriction imposed upon it (i.e. the equation has been misspecified), then the result will be a large F value and a small significance figure, showing that we can reject the H null of no relationship between the dummy variables and the restricted model.

Confidence Intervals and Hypothesis Testing:

The standard error of the estimated coefficient generated by SPSS can be used to calculate confidence intervals for the population parameter β_i with the following equation:

$$\beta_i = b_i \pm t_c SE(b_i) \text{ with } df = n - k$$

Where:

β_i = population parameter of coefficient

b_i = coefficient for sample

$t_c SE(b_i)$ = desired confidence level times standard error of coefficient

k = number of coefficients being estimated including the constant i.e. number of variables in the regression + 1

The **t-values** generated by SPSS regression test the null hypothesis that $\beta_k = 0$ i.e. there is no relationship between the dependent variable (y) and the supposed explanatory variable (x). The *t-value* for each variable is calculated by dividing the coefficient by its standard error (Field, 2000):

$$t = \frac{\beta_{observed} - \beta_{expected}}{SE_{\beta}}$$

where:

$\beta_{observed} = \beta$ value as determined by the regression

$\beta_{expected} =$ the value of β we would expect to obtain if H_0 of no correlation were true (i.e. zero)

$SE_{\beta} =$ standard error of coefficient (β)

The larger the t-value, the less likely it is that the value is a chance result. The associated significance level for the t-value is listed beside each t-value, under **Sig.** The lower the significance, the more effectively the independent variables explain variation in the dependent variable. A significance of 0.05 or lower indicates that the variables are explaining the variation in y.

Wald Statistic: for OLS, *t* and *F* tests are used to test hypotheses. The Wald test serves the same purpose but is able to operate outside of a linear context (Gujarati, 2003). The Wald statistic tests the hypothesis that the estimated coefficient is equal to zero. A high Wald statistic (generally over one), accompanied by associated significance level, indicates that the estimated coefficient is significantly different from zero and that this null hypothesis can be rejected. The Wald statistic (quoted as Wald squared by SPSS) is calculated:

$$\text{Wald} = \frac{\beta}{SE}$$

For large samples, likelihood ratio and the Lagrange Multiplier will accomplish the same purpose as Wald, as the test statistic associate with all three follows a chi-square distribution (Gujarati, 2003).

Log-likelihood: this is a summary statistic from logistic regression which can be considered analogous to the error of sum of squares in OLS, indicating how much unexplained information there is after the model has been fitted (Field, 2000). The larger the value of the log-likelihood, the poorer the fit of the statistical model. It is based on summing the probabilities associated with the predicted and actual outcomes for each case:

$$\text{Log likelihood} = \sum_{i=1}^N [Y_i \ln(\hat{Y}_i) + (1 - Y_i) \ln(1 - \hat{Y}_i)]$$

The difference between log -likelihoods of models is used to compare them using chi square distribution.

$$\chi^2 = 2[(\text{log likelihood for bigger model}) - (\text{log likelihood for smaller model})]$$

NB: in SPSS, the log-likelihood value is multiplied by -2 (-2LL) to approximate a chi-square distribution. Lower values of -2LL indicate improved model fit.

Appendix 2: Diagnostic testing

Appropriate diagnostic tests were conducted on the preferred model, MS8, details of which can be found below. The model was found to perform satisfactorily without further refinements.

Errors in variables.

Errors in the measurement of specific observations were tested by checking for outlying values. NB: an outlier is not necessarily an error and an outlying value might not have a significant influence on the regression. (Visual examination of scatterplots is a simple means of doing this).

Cases with undue influence.

Studentised Residual and Cooks Distance, were also used as a more precise means of testing for outliers. Furthermore, these were used to verify whether or not any outliers were distorting the regression equation. Using Studentised Residuals, any variable with an absolute value (i.e. positive or negative) more than 3 can be considered as an outlier. A Cooks Distance measurement of greater than 1 indicates that the outlier is having an overall influence on the model and could be deleted (Field, 2000). Following this procedure for MS8 identified 20 outlying cases. However, none of these had a significant effect on the regression. DFBeta values, which calculate the difference in the estimated coefficients for each independent variable should a given case be omitted, were also calculated for each explanatory variable. These values were also within acceptable bounds (none greater than 1), indicating that the inclusion of outliers was not influencing the odds ratios. As a result, all of the cases were retained in the analysis.

Multicollinearity

The final model was examined for low t-ratios. Combined with a statistically significant F statistic, this would suggest multicollinearity, a common problem in social scientific models. All t-ratios were strong.

Tolerance and VIF were also checked. The tolerance of x_k (i.e. $1 - R_k^2$) can be found in the general formula for the variance of slope coefficient estimate:

$$\text{Var} [b_k] = \frac{\sigma^2}{(1 - R_{12}^2) \sum_i (x_{ik} - \bar{x}_k)^2}$$

Where R_k^2 is the squared multiple correlations coefficient between x_k and other explanatory variables (eg the R^2 from the regression $x_1 = a_1 + a_2x_2 + a_3x_3$).

A tolerance close to 1 indicates little multicollinearity; close to 0 shows that multicollinearity is a threat.

The reciprocal of the tolerance is the variance inflation factor (VIF). The VIF shows how much the variance of the coefficient is being inflated by multicollinearity. A VIF near to 1 suggests no multicollinearity; near to 5 would be cause for concern.

Where the VIF was particularly high on one regressor, z , a regression of z could be run on the other explanatory variables to see variables are closely related. One or more variables could possibly be omitted if on deliberation we decide they are measuring the same thing.

Employing this procedure on MS8 yielded results as overleaf:

MS8 Tolerance and VIF Statistics

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.074	0.028		38.648	0.000		
net equivalised annual income 11,001-22,000	0.178	0.019	0.086	9.119	0.000	0.673	1.485
net equivalised annual income 22,001-33,000	0.374	0.025	0.163	15.151	0.000	0.521	1.921
net equivalised annual income 33,001-44,000	0.482	0.030	0.175	16.225	0.000	0.519	1.928
net equivalised annual income 44,001-55,000	0.621	0.035	0.183	17.616	0.000	0.561	1.783
net equivalised annual income 55,001-66,000	0.604	0.044	0.134	13.823	0.000	0.642	1.559
net equivalised annual income 66,001- 77,000	0.715	0.050	0.133	14.379	0.000	0.702	1.425
net equivalised annual income 77,001- 88,000	0.532	0.066	0.069	8.092	0.000	0.820	1.219
net equivalised annual income 88,001- 99,000	0.815	0.081	0.085	10.123	0.000	0.850	1.176
net equivalised annual income over 99,001	0.946	0.068	0.122	13.975	0.000	0.787	1.271
long term sick or disabled HoH	-0.169	0.035	-0.039	-4.789	0.000	0.889	1.125
self employed HoH	0.236	0.024	0.079	9.717	0.000	0.922	1.085
second least urbanized quintile	-0.164	0.021	-0.079	-7.924	0.000	0.605	1.653
middle quintile of urbanization	-0.198	0.022	-0.090	-8.802	0.000	0.583	1.715
second most urbanized quintile	-0.235	0.022	-0.114	-10.689	0.000	0.531	1.883
most urbanized quintile	-0.375	0.025	-0.164	-15.182	0.000	0.515	1.943
predominantly terraced nhood	-0.067	0.019	-0.035	-3.621	0.000	0.644	1.552
detached property	0.169	0.020	0.084	8.680	0.000	0.637	1.570
terraced property	-0.096	0.021	-0.049	-4.682	0.000	0.540	1.851
flats	-0.214	0.023	-0.092	-9.461	0.000	0.638	1.567
living in institutional or business premises	-0.219	0.045	-0.040	-4.868	0.000	0.915	1.093
female	-0.233	0.016	-0.130	-14.748	0.000	0.779	1.283
age 17 to 24	-0.170	0.037	-0.037	-4.605	0.000	0.931	1.074
age 65 to 74	-0.117	0.024	-0.047	-4.962	0.000	0.660	1.515
age 75 or over	-0.390	0.023	-0.173	-16.662	0.000	0.563	1.778
Number in Employment in household	0.171	0.012	0.202	14.715	0.000	0.321	3.116
number of children in hh	-0.061	0.009	-0.063	-6.887	0.000	0.725	1.380

Tolerance values and VIF levels were within the acceptable range. That all explanatory variables showed results within acceptable parameters, indicated that no serious multicollinearity was present within the model.

Finally, Eigenvalues and the Condition Index were also checked. By using all the distinct dimensions among the regressor, the eigenvalues indicate how accurate our regression model is (Field, 2000).

Dimension	Eigenvalue	Condition Index
1	5.239	1.000
2	1.916	1.654
3	1.398	1.936
4	1.261	2.038
5	1.109	2.173
6	1.062	2.221
7	1.041	2.244
8	1.030	2.255
9	1.012	2.275
10	1.009	2.278
11	1.004	2.284
12	0.996	2.293
13	0.982	2.310
14	0.972	2.322
15	0.949	2.350
16	0.938	2.363
17	0.909	2.400
18	0.830	2.513
19	0.689	2.758
20	0.668	2.801
21	0.586	2.990
22	0.449	3.415
23	0.380	3.715
24	0.254	4.545
25	0.184	5.343
26	0.091	7.605
27	0.044	10.909

Where several eigenvalues are close to zero, this can indicate a high level of multicollinearity. The condition indices are another way of expressing these values, with indices above 15 suggesting a possible problem and over 30, a serious problem. The variance proportions show proportions of variance of the estimate accounted for by each principal component associate with each of the eigenvalues. Where a component associated with a high condition index contributes substantially to the variance of two or more variables, multicollinearity is likely to be a problem. Notably, the condition index cannot show whether or not any multicollinearity is causing problems

or what can be done to resolve problems present. Again, the model performed satisfactorily and no further refinements were undertaken.

Appendix 3: Application for ethical approval

DEPARTMENT OF URBAN STUDIES ETHICS COMMITTEE

9.9.1.1.1 APPLICATION FOR ETHICAL APPROVAL FOR

9.9.1.1.2 STAFF RESEARCH PROJECTS INCLUDING DOCTORAL RESEARCH

NOTE: Two copies of this application and any accompanying documents must be submitted to Steve Tiesdell, Chris Leishman or Maggie Reid. This form must be filled in electronically and saved in case amendments are required, or in case it has to be forwarded to the Faculty Ethics Committee.

SECTION A

Title of dissertation/research

Working title for qualitative research: *Urban Living: how lifestyles and interests vary across different neighbourhoods*

Thesis title: *Social Inclusion and the Urban Renaissance Without the Car*

Outline of research methods

Please provide a short outline of your proposed research methods, including brief details of the proposed sample (what population or group is to be included, sample size, and how you propose to access and recruit participants), how you will collect your data (e.g. questionnaire, interview) and how you will analyse the data.

Methods: the PhD research design comprises statistical analysis of secondary data, preceding qualitative exploration to develop understanding of the quantitative findings. The preliminary step of qualitative research involves the identification of four relatively affluent (by SIMD income indicator) target neighbourhoods of varying density (census data and property type).

Sample population: the qualitative component of the research is focused upon Glasgow, a major urban centre in the UK appropriate for study as:

- The largest area under the responsibility of one of the research sponsors (Strathclyde Partnership for Transport)
- A city with unusually low levels of car ownership

The population of interest is identified by residence in one of the target neighbourhoods, household type and driver/ non-driver status.

Sample size: a sample of twenty-four interviewees is anticipated (three drivers and three non-drivers from each target neighbourhood). The non-drivers may or may not live in car-less households

Recruitment: after making initial contact with residents in the target areas through personal networks and/or using data available from Strathclyde Partnership for Transport, a snowballing technique will be adopted. This is appropriate as:

- this component of the research seeks to explore the sorts of issues relevant to specific household types in these neighbourhoods rather than seek a representative sample of the general population

information about household structure and income will be required and having a referral from friends/ family/ colleagues of other acquaintances should help to build rapport with potential interviewees.

Every precaution will be taken to secure informed consent. All potential interviewees will be initially contacted by letter and supplied with an information sheet and encouraged to discuss any queries or concerns with the researcher. They will be assured of anonymity, confidentiality and the secure storage of all data collected. Respondents will be classified by gender, identifying letter, driver status, household type and/or neighbourhood (e.g. *Male A, non-driver, couple/ no children, city centre*). No interviews will take place without written consent being obtained in advance. All participants will be advised of their right to withdraw from the study at any point.

Data collection:

Data will be collected in one-to-one interviews lasting approximately 45 minutes. The interviews will be a hybrid of SQUIN (single question inducing narrative)/ semi-structured using a topic guide.

Data analysis: all interviews will, with the interviewees consent, be recorded and fully transcribed. Data will then be coded and analysed using nvivo software.

Name of principal investigator / doctoral student

Julie Clark

Name of doctoral supervisor (if applicable)

Gwilym Pryce

Have you read the guidance on obtaining ethical approval published by the Faculty of Law, Business and Social Sciences?	<u>Yes</u> No
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If you cannot answer YES to this question, you must not proceed any further with this form.

Does your study involve human subjects (i.e. surveys, interviews, observation, etc)	<u>Yes</u> No
---	----------------------

If you have answered YES to this question, you must complete Section B of this form.

SECTION B

Research Checklist

1. Does the study involve participants who are particularly vulnerable or unable to give informed consent? (e.g. children, people with learning disabilities, students you are teaching/supervising)	Yes <u>No</u>
2. Will the study require the co-operation of a gatekeeper for initial access to the groups or individuals to be recruited? (e.g. students at school, members of a self-help group, residents of a nursing home)	Yes <u>No</u>
3. Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g. covert observation of people in non-public places)	Yes <u>No</u>
4. Will the study involve discussion of sensitive topics (e.g. sexual activity, drug use)?	Yes <u>No</u>
5. Are drugs, placebos or other substances (e.g. food substances, vitamins) to be administered to the study participants or will the study involve invasive, intrusive or potentially harmful procedures of any kind?	Yes <u>No</u>
6. Will blood or tissue samples be obtained from participants?	Yes <u>No</u>
7. Could the study induce psychological stress or anxiety or cause harm or negative consequences beyond the risks encountered in normal life?	Yes <u>No</u>
8. Will financial inducements (other than reasonable expenses and compensation for time) be offered to participants?	Yes <u>No</u>
9. Will the study involve recruitment of patients or staff through the NHS?	Yes <u>No</u>

Is there anything you would like to add to further explain your responses to the checklist?

A brief comment on the working title: as discussed with the postgraduate convenor(Mhairi MacKenzie) and my research supervisors, I have adopted a working title for the qualitative component of the research rather than use the title of the thesis.

This is for two reasons:

- 1. The title of the thesis contains terminology which is contested and which is not common currency outside of policy circles*
- 2. The thesis seeks to mitigate the problematic aspects of car ownership/ use in the urban environment and this is reflected in the title; there is a possibility that this might influence potential respondents' willingness to participate in interview and responses given.*

[see Wengraft (2001) on distinguishing theory questions from informant questions]

If in all cases your answer was NO, please submit ONLY this form.

If you answered YES to any of the 9 questions on this checklist, you must complete a full Ethics Application Form. Guidance notes and the form are available at <http://www.gla.ac.uk/lbss/ethics/index.html>.

This should be submitted electronically to Steve Tiesdell, Chris Leishman or Maggie Reid.

Change of research project or methods

Please note that the Ethics Committee will only grant approval on disclosures made in this form. If at any time during the course of your research you decide to materially alter the research topic or the methods you will be using, you MUST complete this form again and submit it to the Ethics Committee.

Personal safety during fieldwork

When you carry out your research there may be times when you are working alone and need to be aware of potential risks to your personal safety. The following sources offer some information and guidance on how to ensure that you are safe.

G. Craig (2004) 'Managing safety in policy research', in Becker, S. and Bryman, A. (eds.) *Understanding Research for Social Policy and Practice*, Bristol: Policy Press, p. 341-5.

The SRA's Code of Practice for the safety of social researchers can be accessed at:

http://www.the-sra.org.uk/staying_safe.htm

The Suzy Lamplugh Trust offers general tips on personal safety:

<http://www.suzylamplugh.org/home/index.shtml>

Appendix 4: Participant information sheet

Information Sheet

Neighbourhood and Lifestyle: the role of urban environment in social and economic participation

Introduction

You are being invited to take part in a one-to-one interview for a research study. Before you decide whether or not to take part, it is important that you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

The research is for a PhD thesis with the working title of Neighbourhood and lifestyle: the role of urban environment in social and economic participation. If you wish to discuss the details of the research, please do not hesitate to contact me, using any of the contact details on the following page. To take part in the study, please complete the consent form attached and I will contact you to discuss a convenient time to meet. The consent form refers to this project alone and will be retained as a record of consent to participation.

Purpose of the Study

My aim is to talk to people in neighbourhoods of Glasgow with different housing types and housing density, at different distances from the city centre. If you choose to participate in an interview, you will be asked about your life, your day-to-day habits, and how these have changed since the time that you moved to your current neighbourhood. The information that I get from the interviews will be used to help me to form conclusions about why people are attracted to different neighbourhoods and how varying urban environments support different kinds of social and economic participation.

The research being is sponsored by the Economic and Social Research Council and Strathclyde Partnership for Transport.

What is Involved

I would like to arrange a face-to-face interview with you. The interview will probably take around 45 minutes. An audio recording will be made of the interview, but the names and details of people taking part will be kept confidential. I may publish some of my research findings, however, if I publish any comments from the interviews no-one will be referred to by name.

Participation in the interview is voluntary and everyone who decides to take part in the research will be given a copy of this information sheet to keep and be asked to sign a

consent form. You can withdraw your consent at any time - you do not need to give a reason.

This project has been approved by the Department of Urban Studies Ethics Committee.

Researcher Details

The principal researcher is Julie Clark from the Department of Urban Studies at the University of Glasgow. For further details on the project or to return the consent form, please contact:

Julie Clark
Principal Researcher
Department of Urban Studies
University of Glasgow
25 Bute Gardens
Glasgow G12 8RS
E-mail: j.clark.1@research.gla.ac.uk
Tel: 0141 330 4377

If you have any questions about the interview, please contact the principal researcher or the Department of Urban Studies dissertation coordinator:

Julie Clark, Principal Researcher
j.clark.1@research.gla.ac.uk
tel: 0141 330 4377

Dr Chris Leishman, Dissertation Coordinator
c.leishman@lbss.gla.ac.uk
tel: 0141 330 5307

If you would like to raise any concerns about how any aspect of this research has been conducted, please contact the Department of Urban Studies
Director of Teaching and Learning:

Dr Steve Tiesdell
s.tiesdell@lbss.gla.ac.uk
tel: 0141 330 4516

Appendix 5: Participant consent form

Interview Consent Form

Neighbourhood and Lifestyle: the role of urban environment in social and economic participation

Principal researchers:

a) Julie Clark

Doctoral Researcher: j.clark.1@research.gla.ac.uk

b) Dr Chris Leishman,

Dissertation Coordinator: c.leishman@lbrs.gla.ac.uk

I confirm that:

(Please tick each box if you agree to each statement)

2. I have read and understood the information provided in the attached information sheet and have had the opportunity to ask questions. ☐
3. The interview will be recorded and anonymised quotations may be used in publications ☐
4. My participation is voluntary and I can withdraw from the study at any time without having to give a reason ☐
5. I understand my participation or non-participation in the study will not lead to any penalty. ☐
6. I agree to take part in this interview. ☐

Name (Please print)

Signature

Date

Appendix 6: Demographic data

Please fill in this sheet and place it in the envelope provided. As with all other interview material, this information is anonymised and treated in strict confidence.

1. Gender

Female	
Male	

2. Ethnicity

To which of these ethnic groups do you consider you belong?

White	British	
	Irish	
	Welsh	
	Scottish	
Other white background (please give details)		
Mixed	White and black Caribbean	
	White and black African	
	White and Asian	
Any other mixed background (please give details)		
Asian or Asian British	Indian	
	Pakistani	
	Bangladeshi	
Any other Asian background (please give details)		
Black or Black British	Caribbean	
	African	
Any other Black background (please give details)		
Chinese	Chinese	
Any other ethnic group (please give details)		

3. Age Group

	Please Tick
17 – 24 years	
25 – 34	
35 – 44	
45 – 54	
55 – 64	
65+	

4. Household Composition

Including yourself, please mark the total number of people in the household who are:

	Please Mark Number
0-2 years	
3 – 4 years	
5 – 11 years	
12 – 15 years	
<u>Dependent</u> children aged 16+	
Non-dependent children	
Adults - under retirement age	
Adults - over retirement age	
Total Number of People in Household	

5. Occupation

	You	Your Partner
Professional		
Managerial or technical		
Skilled non-manual		
Skilled manual		
Partly skilled		
Unskilled		
Armed forces		
Inapplicable		

6. Time at Present Address

_____ Years _____ Months

Thank you for your help

Appendix 7: Interview schedule

I want you to tell me about what's been happening in your life ever since you first came to the neighbourhood you live in now - big changes and just day to day routine.

Maybe you could start around when you first decided to move to the area, and continue talking through how things have been developing for you up to now.

- Please take the time you need.
- I'll listen first. I won't interrupt.
- I'll just take some notes for after you've finished telling me about the experiences that have been important for you.

Notes:

Order	Semi-structured Themes	Related Narrative
	<p><u>Neighbourhood:</u></p> <p>Friends/ family in neighbourhood (how often see/ where meet/ how contact?)</p> <p>Acquaintances/ passing contacts in neighbourhood</p> <p>Walking in neighbourhood (frequency/ distance/ purpose)</p> <p>Cycling/ public transport use (frequency/ distance/ purpose)</p> <p>Feeling of safety/ security</p> <p>Would you consider living (vary by housing type/ centrality)...</p> <p>City centre/ Further into/ out of the city</p> <p>Detached/ terraced/ tenement or apartment</p> <p>Emergent:</p>	

Order	Semi-structured Themes	Related Narrative
	<p><u>Travel and Transport</u></p> <p>Think about all the different places that you tend to go, in and around the city.</p> <p>Follow up: How do you get to them? <i>PROMPT: walk cycle taxi bus underground train car driver/ passenger</i></p> <p>Like/ dislike about the main modes of transport you use? <i>PROMPT: walking and cycling</i></p> <p>Who in the household has a driving licence?</p> <p>How many cars do you have regular access to just now?</p> <p>Who is the main driver of each car?</p> <p>How often do you use a car (as driver/ passenger/ taxi)</p> <p>What sort of things do you mostly use the car for (as driver/ passenger/ taxi)</p> <p>Happy/ unhappy are you with your current level of access to car transport?</p> <p>If car not always available: Strategies to replace car use (online shopping, friends, taxis, hiring)?</p> <p>Does anyone in the household have problems with physical mobility? How has that affected your choices about where you live? The transport you use?</p>	

Order	Semi-structured Themes	Related Narrative
	<p><u>Connecting Travel and Neighbourhood</u></p> <p>How different is your level of car use now from the last neighbourhood you lived in?</p> <p>Happy / unhappy are you with the level of traffic in your neighbourhood? (prompt: traffic, parking, walkability, environmental issues)</p> <p>Have you ever considered moving house because of problems with you transport or traffic in your neighbourhood? <i>PROMPT: quality of life; environmental concerns</i></p> <p>Emergent:</p>	

4. I'm looking for other people to interview locally [*probe on exact location and property type if uncertain*]
5. I need people who are really very comfortably off just now - in a position to make choices about holidays or where they live and what they drive [*probe to verify*]
6. Do you know if they drive? [*probe on no. of household cars if appropriate*]
 - d. Do you know of any other [*men/women*] in the area that might be good to talk to?
 - e. It would also be good to speak with someone [*in age group*] if possible
 - f. Can you think of any [*single people/ couples/ young families/ families with older or grown up children*]?

THANK YOU

Could I check back with you in a few days in case you've managed to think of anyone else who might be able to help?