Urban Quality of Life: Linking Objective Dimensions and Subjective Evaluations of the Urban Environment

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Statement of Originality

The work as presented in this thesis is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text. I hereby declare that I have not submitted this material, either in whole or in part, for a degree at this or any other institution.

________________________________________
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Publications Relevant to this Thesis

The publications below authored by the candidate relate to the thesis topic of urban quality of life but do not form part of this thesis:

**Journal Papers**


**Conference Presentations and Papers** (# subsequently published)


Abstract

Urban quality of life (QOL) is an important component of overall life satisfaction and has broad implications for regional migration, economic growth and environmental sustainability. Subjective urban QOL stems from objective characteristics of the urban environment. However, few studies have examined links between objective and subjective indicators relating to urban QOL. In many other life domains such as income and health, links between objective and subjective indicators have been found to be surprisingly weak, as may be the case with urban QOL.

This thesis examined links between broad objective dimensions of the urban environment (underlying the urban structure in South East Queensland, Australia) and associated subjective evaluations of the urban environment. Two main research questions were addressed:

RQ 1: What are the strength of direct links between broad objective dimensions and subjective evaluations of the urban environment?

RQ 2: How do effects of psychological processes, individual and social group differences, and residential relocation influence these links?

The objective dimensions of the urban environment examined in this thesis were both physical and social. The objective physical dimensions related to distances from services and facilities; population, housing and road densities; distances to rural and semi-rural land; and distances from the coast. The objective social dimensions related to household structure; socioeconomic environments; disadvantaged environments; and ethnic environments. The associated subjective evaluations of the urban environment related to satisfaction with access to services and facilities; subjective ratings of urban problems; subjective evaluations of the natural environment, and subjective evaluations of the social environment.

The research questions were examined using quantitative analysis of secondary data. For the objective dimensions, data were obtained from Geographic Information System (GIS) datasets and the Australian population census while data for the subjective evaluations were gained from the 2003 Survey of Quality of Life in South East Queensland. Using GIS technology, the objective and subjective secondary datasets were linked by geocoding locations of residents responding to the quality of life survey. Relationships between objective and subjective aspects of urban quality of life were then analysed using Generalised Linear Modelling.
The findings in the first analytical chapter showed that direct links between various broad objective dimensions and subjective evaluations of the urban environment were weak. The following three analytical chapters examined the extent to which these weak relationships were explained by psychological processes, individual and social group differences, and residential relocation processes, respectively.

The chapter on psychological processes found that subjective judgement models were a plausible explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment in the scenario where individual standards of comparison were close to and highly correlated with targets (i.e., the individual residential locations on objective dimensions of the urban environment). This scenario implied an underlying process which aligned standards of comparison with targets. However, such aligning was not explained by psychological adaptation after moving to a new residential location.

In the next chapter, individual and social group differences in the subjective importance of various attributes of the urban environment were examined as an alternative explanation for the weak relationships between objective dimensions and subjective evaluations of the urban environment. However, weighting objective dimensions by the subjective importance of associated attributes of the urban environment did not explain these weak relationships since this did not significantly improve prediction of associated subjective evaluations of the urban environment.

In the last analytical chapter, residential relocation was examined as a potential process for aligning individual standards of comparison and targets while searching for vacancies which meet individual standards. Support was found for residential relocation as a process which aligns standards of comparison and targets on objective dimensions of the physical environment but not on objective dimensions of the social environment. Further, social homophily (or the subjective importance of living near others with similar social characteristics) was not very important in explaining objective dimensions of the social environment, suggesting that links between objective dimensions and subjective evaluations of the social environment were inherently weak.

In the last chapter, the findings were drawn together into a multifaceted explanation of the weak relationships between objective dimensions and subjective evaluations of the urban environment. Then implications were drawn for urban QOL theory and urban planning; together with discussing limitations with this research and recommendations for future research.
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<th>Description</th>
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<tbody>
<tr>
<td>CCD</td>
<td>Census Collection District</td>
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<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>GLM</td>
<td>Generalised Linear Modelling</td>
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<tr>
<td>QOL</td>
<td>Quality of life</td>
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<tr>
<td>SEQ</td>
<td>South East Queensland</td>
</tr>
<tr>
<td>The 2003 QOL Survey</td>
<td>The 2003 Survey of Quality of Life in South East Queensland</td>
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<td>The population census</td>
<td>The 2001 Census of Population and Housing</td>
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Chapter 1  Introduction

This thesis investigates links between broad \textit{objective} dimensions of the urban environment which underlie the structure of urban regions and associated \textit{subjective} evaluations of the urban environment which underlie subjective urban quality of life (QOL) using data for the South East Queensland (SEQ) region, Australia. Urban environments can be defined by land use; excluding land primarily used for agricultural production or large tracts of natural vegetation (e.g., National Parks) and including land primarily used for residential, manufacturing, commercial, or other services. Urban QOL is viewed subjectively in this thesis as satisfaction with living in urban environments.

A primary objective in regional urban planning is to enhance urban quality of life (QOL), as is the case in SEQ (Office of Urban Management, 2005). However, relatively few studies have actually linked objective and subjective indicators of the urban environment (Marans, 2003). The strength of links between broad objective dimensions and subjective evaluations of the urban environment needs to be tested because despite intuitive beliefs they should be at least moderately strong, they may be surprisingly weak.

Research in other life domains like income and health have shown links between objective circumstances and subjective satisfaction are frequently weak, and this has generally been explained in terms of intervening psychological processes (see Cummins, 2000; Diener, Lucas, & Scollon, 2006; S. Evans & Huxley, 2002; Kahneman, 1999; Schwarz & Strack, 1999). If the links between objective dimensions and subjective evaluations of the urban environment are also weak, then this needs to be established to avoid simple assumptions being made that changes in objective dimensions of the urban environment will result in significant and direct changes in subjective urban QOL.

A range of explanations can be used to account the strength of relationships between objective dimensions and subjective evaluations of the urban environment with differing implications for urban QOL and planning. For example, if moderate to strong direct relationships were found, this implies an environmentally deterministic model with changes in broad objective dimensions of the urban environment directly impacting on subjective urban QOL. If weak relationships were found, the implications may depend on the explanation found for weakness. For example, if the weakness was best explained by psychological adaptation where residents simply adjust psychologically to changes in the objective urban environment, this implies that changes in broad objective dimensions of the urban environment have relatively little impact on subjective urban QOL after a period of time. On the other hand, if the weakness was best explained by adjustment via residential relocation whereby dissatisfied
residents tended to move to other locations while satisfied residents tended to stay, this implies a significant impact on subjective urban QOL.

Thus, it is important not only to examine the strength of links between objective dimensions and subjective evaluations of the urban environment, but also to examine a range of explanations that may account for the strength of these links. Accordingly, this thesis examines both the strength of links, together with a range of explanations which may impact on the strength of those links (i.e., psychological processes; individual and social group differences; and residential relocation). This thesis aims to identify the best explanation for relationships between objective dimensions and subjective evaluations of the urban environment, and discuss the subsequent implications for urban QOL theory and urban planning.

1.1 The Importance of Urban QOL

Maintaining or enhancing quality of life (QOL) is an underlying aim of many activities in life. Many areas of life contribute significantly to overall QOL such as employment, health, relationships, friends, income, as well as the environments we live in. These areas of life are called ‘life domains’, and the domain of interest in this thesis is ‘urban QOL’ (i.e., liveability in urban environments). Many studies have found that satisfaction with urban living environments contributes significantly to overall life satisfaction (e.g., Campbell, Converse, & Rodgers, 1976; Marans & Rodgers, 1975; McCrea, Shyy, & Stimson, 2006; McCrea, Stimson, & Western, 2005; Sirgy & Cornwell, 2001; Sirgy & Cornwell, 2002).

In an ever urbanising world, urban QOL is increasingly important. Approximately half the world’s population is now living in urban areas, with increasing urbanisation predicted (see Figure 1-1), and in Australia approximately three quarters live in urban areas (Australian Bureau of Statistics, 2006b). The SEQ region is very urbanised with approximately 90 percent of the regions population concentrated in three main urban centres (Brisbane, the Gold Coast and the Sunshine Coast), as well as being Australia’s fastest growing region attracting over 1,000 new residents per week on average (Office of Urban Management, 2005). Thus, urban QOL is an increasingly important issue in SEQ and regions across the world. Accordingly, urban QOL is of increasing interest across a range of disciplines (e.g., urban planning, human geography, urban sociology, and environmental psychology).
Urban QOL is not only important because it affects life satisfaction, but also because it has broader implications. It underlies demands for public action (Dahmann, 1985); motivates residential relocation decisions (Campbell, Converse, Rodgers, & Marans, 1976; Golledge & Stimson, 1987; Lu, 1998); and has broad implications for regional migration patterns, economic growth, and environmental sustainability (see Kemp et al., 1997).

For example, migration patterns and urban growth are often attributed, at least in part, to differences in urban QOL between places (e.g., Keeble, 1990; Ley, 1996; Liaw, Frey, & Lin, 2002). In a study conducted for the United States Department of Housing and Urban Development, Glaeser, Kolko and Saiz (2000) identified a variety of urban QOL issues relating to consumption experiences that were drivers of urban growth and migration:

(a) A rich variety of high quality public services (especially in health, education and public safety services)
(b) Aesthetic and attractive physical settings in the form of architecture, urban design, and natural endowments
(c) Easy movement around the city, with resident location now having more to do with easy access to consumption opportunities and less to do with access to work
(d) A housing stock that is architecturally distinctive, affordable and varied
(e) Neighbourhoods that are safe and ethnically diverse, that offer transport choices, that have a mix of compatible uses (e.g. retail, residential and commercial), and that contain parks and open spaces
(f) Civic spaces and civic activities that provide opportunities for social interaction among residents
(g) A reasonable cost of living

Urban QOL considerations not only influence *inter*-regional migration, but influence *intra*-regional migration. The migration of high income households to inner areas of metropolitan regions (i.e., gentrification) has been tied to urban QOL issues, especially higher end consumption opportunities (e.g., Lees, 2000; Ley, 1996). Conversely, other households may migrate to outer suburbs and urban fringe areas for other reasons relating to nature, space, schools and housing (e.g., Smith & Phillips, 2001; Sullivan, 1994; Vogt & Marans, 2004). These contrasting intra-regional flows highlight individual differences in the subjective importance of various attributes of the urban environment and subjective urban QOL.

Not only do people migrate to places affording them higher urban QOL, but so does economic capital. Studies in Europe and North America show QOL considerations influence decisions about where to locate businesses and industries (Brotchie, Newton, Hall, & Nijkamp, 1985; Grayson & Young, 1994; Rogerson, 1999). Economic growth is also facilitated to the extent that skilled labour is attracted to and retained in places offering higher urban QOL. In an ever globalising world, economic capital is even freer to move to places offering high urban QOL, which in turn affects a place’s competitiveness and economic viability (Sirgy, Rahtz, Cicic, & Underwood, 2000).

Lastly, urban QOL has broader implications for environmental sustainability. Environmental sustainability is tied to population and economic growth, and thus environmental sustainability can become a major concern in rapidly growing regions such as South East Queensland region (SEQ), Australia. Environmental, population and economic considerations become tied together in urban issues such as air, water and noise pollution; water and energy consumption; waste generation and disposal; land supply and use; conservation and open space; and public infrastructure provision like transportation networks (Kemp et al., 1997).

Urban QOL is an important topic of investigation because it has broad implications for regional migration, population growth, economic growth and environmental sustainability. Further, urban QOL
is important apart from these broad implications, simply because it contributes significantly to the overall life satisfaction of residents.

1.2 A Broad Conceptual Model of Subjective Urban QOL

Since this thesis examines subjective evaluations of the objective urban environment, urban QOL is viewed ultimately as subjective\(^1\). A model of subjective urban QOL is needed for this thesis which is broad enough to accommodate a range of explanations which may impact on links between objective dimensions and subjective evaluations of the urban environment.

Few models of subjective urban QOL in the literature are this broad. However, in a seminal work by Marans and Rodgers (1975) subsequently modified by Campbell, Converse, Rodgers and Marans (1976), a broad conceptual model of subjective urban QOL was provided which is useful as a overarching conceptual framework for this thesis (see Figure 1-2). Despite being formulated approximately four decades ago, this broad conceptual model still provides a comprehensive general framework for conceptualising relationships between the objective urban environment and subjective urban QOL by virtue of its generalised nature. Moreover, it is especially applicable to this thesis because it explicitly links objective characteristics and subjective evaluations of the urban environment while allowing for a range of factors which may impact on these links; namely individual and social group differences via the personal characteristics of residents, psychological processes via individual standards of comparison, and residential relocation processes via moving intentions of residents.

This model by Campbell, Converse, Rodgers and Marans (1976) is based on an earlier model of satisfaction with residential environments developed by Marans and Rodgers (1975) with a few modifications. Firstly, this later model incorporates moving intentions, which is presumably why it also incorporates a correlation between personal characteristics and objective characteristics of the urban environment. Secondly, this model includes two way relationships between urban domains rather than one-way downward relationships, making the urban domains more inter-related. Finally, this model does not divide the neighbourhood level into micro- and macro-neighbourhood levels since empirical analysis of the original model found satisfaction with the macro-neighbourhood level to be so strongly related to the community level as to question the usefulness of distinguishing between them (Marans & Rodgers, 1975)\(^2\).

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\(^1\) The alternative notion of ‘objective’ urban QOL is discussed in the literature review.

\(^2\) Micro-neighbourhood level refers to immediate clusters of adjacent houses (approximately 6 or so); macro-neighbourhood level refers to areas defined by grade school districts and major thoroughfares; and community level areas relate to the provision of local government services.
1.2.1 The Conceptual Model in Detail

The model in Figure 1-2 is worth explaining in detail since it provides a broad conceptual framework for this thesis. The single headed arrows indicate casual relationships, with the causal ordering in the figure generally being from left to right, while the double headed arrow indicates a correlation. The far left shaded box represents objective characteristics of the urban environment at different levels of the urban environment. These then predict subjective perceptions of the urban environment which in turn predict subjective evaluations of the urban environment. For example, loud traffic in a resident’s neighbourhood is subjectively perceived by the senses and subjectively evaluated as noisy. A range of subjective evaluations of a resident’s neighbourhood then predict satisfaction in that urban domain (i.e., neighbourhood satisfaction), as well as predicting satisfaction in other urban domains (i.e., housing and community satisfaction). Satisfaction in these three urban domains in turn predicts overall life satisfaction (together with satisfaction in other life domains: employment, relationships, health etc.). Satisfaction in urban domains also predicts moving intentions, and thus
subjective urban QOL can be linked back to the objective urban environment, as well as to other broader implications for regions.

1.2.2 The Influence of Personal Characteristics

The model shows personal characteristics influencing many parts of this process. In this thesis, personal characteristics of residents are divided into two basic types: individual and social characteristics. Individual characteristics or ‘individual differences’ distinguish between individual residents based on individual internal states. For example, individual differences include moods (positive and negative affect), standards of comparison (expectations and aspirations), and the subjective importance of various attributes of the urban environment to individual residents. In contrast, social characteristics locate individuals within a social structure; for example, family status, socioeconomic status and ethnicity.

Starting from the left in Figure 1-2 and moving right, personal characteristics are correlated with objective characteristics of the urban environment, as indicated by the double headed arrow. The authors do not discuss how this correlation arises (see Campbell, Converse, Rodgers, & Marans, 1976) and as such, a causal relationship is not explicit in the model. However, personal characteristics may become correlated with the objective urban environment via the process of residential relocation to the extent that residents with similar individual and social characteristics choose locations with similar objective urban environments.

Next, personal characteristics are shown as influencing subjective perceptions of the urban environment (i.e., sensory perceptions of the urban environment). These influences are not discussed in any detail and the moreover, links between objective characteristics and subjective perceptions of the urban environment are assumed to be relatively direct (Campbell, Converse, Rodgers, & Marans, 1976; Marans & Rodgers, 1975).

In contrast, relationships between subjective perceptions and subjective evaluations of the urban environment are seen as influenced by personal characteristics in a complex way. Specifically, subjective evaluations are predicted by the difference between subjective perceptions of the urban environment and standards of comparison. In other words, subjective perceptions of the urban environment are seen to influence subjective evaluations of the urban environment to the extent that they differ from standards of comparison. This reflects a psychological process.

In addition, other personal characteristics may directly influence both subjective evaluations of the urban environment and satisfaction in urban domains (e.g., social desirability bias, mood bias, and personality).
The arrow from personal characteristics to the relationships between subjective evaluations and satisfaction in urban domains refers to possible moderating effects of personal characteristics on these relationships. For example, relationships may be stronger for residents who consider a particular attribute of the urban environment as very important or a relationship may be stronger for a particular social group.

Similarly, the last arrow from personal characteristics to relationships between satisfaction in urban domains and moving intentions also refers for possible moderating effects on these relationships. For example, disadvantaged residents may face constraints in moving even though they may be dissatisfied with their subjective urban QOL.

In summary, the conceptual model proposed by Campbell, Converse, Rodgers and Marans (1976) is ideally suited as a broad conceptual framework for this thesis. Besides the strength of being very comprehensive - drawing on insights from geography, psychology and sociology – it problematises direct links between objective characteristics and subjective evaluations of urban environments. Thus, this is an effective model for investigating the strength of direct links between them which may be assumed to be relatively direct in a more naïve model.

1.3 The Research Gap and Research Questions

In QOL research generally, objective indicators are used to estimate objective QOL while subjective measures are used to estimate subjective QOL. This has lead to QOL research being divided into two broad paradigms: objective QOL and subjective QOL research (Andelman et al., 1998).

In the urban domain, objective urban QOL research often focuses on ‘objectively’ ranking different places on urban QOL (e.g., Blomquist, Berger, & Hoehn, 1988; Landis & Sawicki, 1988; Savageau & D’Agostino, 1999) while subjective urban QOL research focuses on establishing the importance of various subjective evaluations of the urban environment in predicting subjective urban QOL (e.g., Cook, 1988; Parkes, Kearns, & Atkinson, 2002; Sirgy & Cornwell, 2001). Accordingly, most urban QOL studies focus on either objective or subjective indicators, and where both objective and subjective indicators are included in a study, they are often conceptualised as separate indicators of objective and subjective urban QOL respectively (see Cutter, 1985).

In contrast, few urban QOL studies link objective and subjective indicators together to empirically examine relationships between them (e.g., Campbell, Converse, & Rodgers, 1976; Marans & Rodgers, 1975; McCrea, Shyy, & Stimson, 2006). This reflects a research gap in urban QOL literature which is investigated in this thesis (see Figure 1-3).
The lack of research in this gap enables a simple or naïve model of subjective urban QOL to exist where links between objective characteristics and subjective evaluations of the urban environment may be assumed to be relatively uncomplicated and at least moderate in strength (see Figure 1-4). While this naïve model is not often explicitly stated, it is often implied when changes in the objective urban environment are assumed to have direct effects on subjective urban QOL. However, as the theoretical models by Marans and Rogers (1975) and Campbell et al. (1976) show, the links between objective characteristics and subjective evaluations of the urban environment may also be influenced by personal characteristics (both individual and social), standards of comparison and residential relocation. These influences may in fact weaken links between objective characteristics and subjective evaluations of the urban environment.

As mentioned, in QOL research generally, links between objective circumstances and subjective satisfaction are commonly found to be weak across a variety of life domains (see Cummins,
2000; Cummins & Nistico, 2002; S. Evans & Huxley, 2002; Schwarz & Strack, 1999). And in urban environments, the strength of links between objective characteristics and subjective evaluations of the urban environment may not be strong, as suggested by the common finding that most residents are satisfied with their urban environments, even if rated low in ‘objective’ urban QOL (e.g., Cummins, 2000) or even if the urban environments are those of disadvantaged groups (e.g., Cook, 1988).

1.3.1 Thesis Aims and Research Questions

This thesis aims to measure the strength of direct links between various broad objective dimensions of the urban environment and associated subjective evaluations; as well as to examine the impacts on these links of psychological processes involving standards of comparison, personal characteristics (both individual and social), and residential relocation. These two aims translate into two main research questions:

RQ 1: What are the strength of direct links between broad objective dimensions and subjective evaluations of the urban environment?

RQ 2: How do effects of psychological processes, individual and social group differences, and residential relocation influence these links?

This thesis also aims to infer the best explanation(s) for the strength of links between objective dimensions and subjective evaluations of the urban environment, as well as to discuss the implications for urban QOL theory and urban planning.

1.4 Outline of the Study

1.4.1 The Situational Context for the Study – The South East Queensland Region

As mentioned, the study area is the South East Queensland (SEQ) region, Australia (see Figure 1-5 and Figure 1-6). The SEQ region has a population of 2.6 million and is rapidly growing with an annual growth rate of 2.1% (Australian Bureau of Statistics, 2006a). This region has a multi-centred urban form. At the main centre of the SEQ region is Brisbane city, the capital of Queensland. The SEQ region has two other main urban areas: the Gold Coast and the Sunshine Coast, both popular tourist and retirement destinations lying south-east and north of Brisbane respectively.
Figure 1-5. The South East Queensland region in Australia

Source: the author
Figure 1-6. Urban centres and localities in the South East Queensland region

Legend
- Urban centres and localities
- Rural Balance
- Highway
- Railway

Source: the author
The wider Brisbane area has three rapidly growing corridors: one to the west incorporating Ipswich (an old mining and industrial centre); one to the south east incorporating Logan and virtually linking with the Gold Coast; and one to the north incorporating Caboolture and growing toward the Sunshine Coast. Surrounding these main urban centres, the SEQ region has smaller urban centres or towns. More specifically, the SEQ region is defined as a combination of the Moreton and Brisbane Statistical Divisions within the Australian Standard Geographic Classification (Australian Bureau of Statistics, 2001a); however, only urban areas within SEQ are examined in this thesis (see Chapter 3 on data and methodology).

The rapidly growing population in SEQ underlies most regional planning issues. The SEQ Regional Plan (Office of Urban Management, 2005) aims to limit growth in coastal areas under pressure from continuing development, as well as limiting urban sprawl into rural and natural areas for ecological, scenic, recreational and rural production considerations. As a result, the SEQ regional plan focuses on increasing densities in existing non-coastal urban areas, especially near existing infrastructure, to promote efficient use of existing services and facilities. More generally however, the SEQ Regional Plan has the stated aim of achieving sustainable growth while maintaining urban QOL.

1.4.2 Objective Dimensions and Subjective Evaluations of the Urban Environment Studied

This study examines links between various objective dimensions and subjective evaluations of the urban environment in the SEQ region. In this study, secondary data for the objective dimensions are obtained from various GIS datasets and from the 2001 Census of Population and Housing (Australian Bureau of Statistics, 2001a) while secondary data for subjective evaluations are obtained from the 2003 Survey of Quality of Life in South East Queensland (the 2003 QOL Survey). These objective dimensions and subjective evaluations are then linked by geocoding residential addresses of respondents in the 2003 QOL Survey (explained in more detail later in Chapter 3 on data and methodology).

In linking objective characteristics and subjective evaluations of the urban environment, there are countless objective characteristics of urban environments which may be considered relevant to urban QOL, and each needs to be matched with associated subjective evaluations of the urban environment. Further, objective characteristics of urban environments may be measured at a specific or broad level. For example, access to a post office is a specific characteristic of residential locations whereas access to services and facilities generally is a broad dimension within urban environments.

This thesis focuses on broad dimensions of the objective urban environment for two main reasons.
1. Given available data, matching specific objective characteristics with specific subjective evaluations is difficult using secondary datasets not designed to match at a detailed level.

2. It is easier to encapsulate urban QOL using a limited number of broad dimensions rather than a countless number of more specific objective characteristics of urban environments.

3. Broad dimensions of the urban environment are more related to urban form and are therefore more relevant to broad regional planning issues discussed in the SEQ regional plan.

Ten broad objective dimensions of the urban environment are examined in this thesis together with associated subjective evaluations of the urban environment (see Table 1-1). The associated subjective evaluations of the urban environment were chosen from data available in the 2003 QOL Survey because they were conceptually closely related to the objective dimensions of the urban environment. There may be other more closely related combinations of objective dimensions and subjective evaluations. However, this research is limited to examining relationships between related objective and subjective variables using data from the available secondary datasets previously mentioned.

Table 1-1. Objective dimensions and subjective evaluations of the urban environment examined for South East Queensland

<table>
<thead>
<tr>
<th>Objective dimensions of the urban environment</th>
<th>Associated subjective evaluations of the urban environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective dimensions of the physical environment</td>
<td></td>
</tr>
<tr>
<td>Objective access</td>
<td>Subjective access</td>
</tr>
<tr>
<td>Objective density</td>
<td>Subjective overloading</td>
</tr>
<tr>
<td>Objective rural environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective dimensions of the social environment</td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective nuclear family households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective older non-nuclear households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td>Subjective social environment</td>
</tr>
</tbody>
</table>

Source: the author
There may also be relationships between objective dimensions and subjective evaluations of the urban environment in Table 1-1 other than the ones shown in the table. For example, objective dimensions of the social environment may be associated with subjective overloading. However, this would presumably be mediated by a more conceptually related link with objective density. Similarly, objective density may be associated with subjective access, but presumably this relationship would be mediated by a more conceptually related link with objective access.

Although these objective dimensions and subjective evaluations of the urban environment are discussed in more detail in later chapters, a brief explanation of them is provided here. Objective access relates to distances from services and facilities while subjective access relates to subjective evaluations of satisfaction with access to services and facilities.

Objective density relates to population, dwelling and road densities while subjective overloading relates to subjective evaluations of various urban problems associated with living in a rapidly growing urban region.

Both objective access and objective density are both related to urban QOL via the theory of optimum centrality (Archibugi, 2001; Cicerchia, 1999) whereby increasing size and density of urban centres gives rise to increasing access to services and facilities but at the same time generates urban problems, such as congestion and pollution, which is termed ‘urban overloading’.

The objective rural environment and objective coastal environment relate to how far a resident’s home is from rural land or the coast respectively. Both rural land and the coast are seen as parts of the natural environment while the subjective natural environment relates to subjective evaluations of the natural environment. The natural environment is subsequently related to urban QOL because the natural environment can facilitate recovery from stress associated with urban living (Berto, 2005; Kaplan, 1995; Ulrich, Simons, Losito, Fiorito, & et al., 1991).

Finally the six objective dimensions of the social environment were derived from a study of the social and spatial structure of SEQ (Western & Larnach, 1998). This thesis explores the extent to which subjective evaluations of the social environment are related to these six objective dimensions of the social environment, including how this may depend on whether residents consider it important to live near people with similar social characteristics to themselves or the importance of social homophily (see Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001).

Although other broad objective dimensions and subjective evaluations of the urban environment may have been examined, these can be applied to the research questions, they cover a range of
dimensions in both the physical and social environment underlying the structure of the SEQ region, and they relate to readily available secondary data.

1.4.3 **Personal Characteristics, Standards of Comparison and Residential Relocation**

As mentioned, this thesis examines the impact of personal characteristics, standards of comparison, and residential location on relationships between objective dimensions and subjective evaluations of the urban environment. While these impacts are discussed more fully in later chapters, an introduction to these impacts and how they are examined in this thesis is provided below in outlining this study.

Figure 1-7 represents a simplified and slightly modified version of the broad conceptual frame (see Figure 1-2) and focuses on relationships between objective dimensions with subjective evaluations of the urban environment. The objective dimensions predict subjective evaluations of the urban environment directly rather than being mediated by subjective perceptions since little data are available for sensory perceptions from the 2003 QOL Survey. However, this mediated relationship was assumed to be relatively direct in the broad conceptual framework.

**Figure 1-7. Potential influences of personal characteristics on links between objective dimensions and subjective evaluations of the urban environment**

In Figure 1-7, the first arrow makes explicit the influence of personal characteristics in shaping the objective physical and social dimensions of the urban environment via the process of residential relocation. This influence on objective dimensions of the urban environment is explored by examining individual differences between residents in the subjective importance of various attributes of the
objective urban environment in choosing where to live. Individual differences in choosing where to live means that residents are not randomly distributed throughout the urban environment, and this should impact on the link between objective dimensions and subjective evaluations of the urban environment as residents tend to move to locations which they evaluate favourable on attributes of the urban environment subjectively important to them.

The second arrow shows that personal characteristics may moderate relationships between objective dimensions and subjective evaluations in the urban environment. This is in contrast to the potential moderating effects of personal characteristics between subjective evaluations of the urban environment and satisfaction in urban domains shown in the conceptual model in Figure 1-2. Much research has been conducted on the latter moderating effects (reviewed in Chapter 2) but little on the former moderating effects since initial work by Campbell et al. (1976).

Moderating effects may be reflected in stronger relationships between objective dimensions and subjective evaluations of the urban environment for residents who consider particular attributes of the urban environment as more important. For example, relationships between objective dimensions and subjective evaluations of the social environment may be stronger for residents considering it important to live near neighbours with similar social characteristics (i.e., an influence of social homophily). Conversely, among residents who do not consider living near similar people as important, there may be weaker links between associated objective dimensions and subjective evaluations of the social environment.

The third arrow shows standards of comparison may influence subjective evaluations of the urban environment. Residents may compare their objective urban environments with standard of comparisons in forming subjective evaluations of their urban environment (see Schwarz, Strack, Kommer, & Wagner, 1987 for an experimental study associated with housing). A favourable or unfavourable subjective evaluation may depend on individual standards of comparison. So, differing individual standards of comparison have the potential to weaken direct links between objective dimensions and subjective evaluations of the urban environment.

While no direct measures of standards of comparison were available from the 2003 QOL Survey, the role of standards of comparison is explored in this thesis by calculating implied standards of comparison based on a resident’s objective urban environment and their subjective evaluations of their urban environment.

The fourth arrow refers to personal characteristics that may bias subjective evaluations of the urban environment (e.g., social desirability bias, response set bias and mood bias). Measures for mood were available in the 2003 QOL Survey (i.e., positive affect and negative affect), and these were used
as control variables to statistically remove mood bias from subjective evaluations. Mood bias has been found to bias a wide variety of subjective evaluations (reviewed in Chapter 2).

The potential influences of personal characteristics, standards of comparison, and residential relocation on the strength of relationships between objective dimensions and subjective evaluations of the urban environment raises an initial question about the strength of any ‘direct’ relationships between them, which may be assumed to be at least moderately strong in a more simple or naïve model. However, these potential influences may not be equally important which raises a second question about how relationships between objective dimensions and subjective evaluations of the urban environment may be best explained. These two questions are essentially reformations of the two basic research questions mentioned previously.

1.5 Summary and Thesis Outline

Urban QOL has broad implications for regions relating to regional migration, population growth, economic growth and environmental sustainability. Moreover, it is important to our overall life satisfaction. Thus urban QOL is an important topic of investigation.

In this thesis, urban QOL is conceptualised as subjective. Subjective evaluations of urban environments are conceptualised as stemming from objective characteristics of urban environment while at the same time being influenced by personal characteristics of residents. However, despite the conceptualised links between objective characteristics and subjective evaluations outlined in the seminal work done in the mid-70s (Campbell, Converse, Rodgers, & Marans, 1976; Marans & Rodgers, 1975), rarely have objective characteristics and subjective evaluations of the urban environment been linked together in urban QOL studies (Marans, 2003).

This lack of empirical investigation into the strength of such links may encourage the persistence of a naïve view that links between objective characteristics and subjective evaluations of the urban environment are reasonably direct and at least moderately strong. In targeting this research gap, this thesis empirically examines the strength of links between broad objective dimensions and subjective evaluations of the urban environment (RQ1) as well as examining the effects that personal characteristics, standards of comparison, and residential relocation may have on these links (RQ2).

This thesis aims to answer these two questions with a view to discussing implications for urban QOL theory and urban planning. These implications may depend to some extent on which explanation(s) best accounts for relationships between objective dimensions and subjective evaluations of the urban environment.
Below is an outline of the remaining chapters in this thesis. The literature review in Chapter 2 discusses concepts, theories and empirical evidence relating to urban QOL and the research questions being addressed in this thesis. Chapter 3 focuses on data and methodology. It describes the datasets; the sampling methodology for the 2003 QOL Survey; the process of geocoding the residential locations of survey respondents; as well as defining the main objective and subjective measures used in analyses, and providing descriptive statistics and spatial distributions for these variables. Chapter 4 addresses RQ1 by examining the strength of direct links between objective dimensions and subjective evaluations of the urban environment, while Chapters 5, 6 and 7 address RQ2 by examining various impacts on these links. Chapter 5 on psychological processes examines the implications of varying standards of comparison on these links. Chapter 6 examines possible moderating effects of individual and social group differences in subjective importance of various attributes of the urban environment. And Chapter 7 on residential relocation examines how the process of choosing a suitable place to live may affect links between objective dimensions and subjective evaluations of the urban environment. In the final chapter (Chapter 8), the findings from Chapters 4 through 7 are drawn together in answering the two main research questions, as well as drawing implications for urban QOL theory and urban planning; discussing limitations with this research; and making recommendations for future research.
Chapter 2  Urban Quality of Life: A Review of Concepts, Theory and Empirical Evidence

This chapter reviews the literature on urban quality of life (urban QOL). It starts with examining the broad concept of QOL before narrowing the concept to urban QOL, and then to objective and subjective notions of urban QOL, the latter being the focus in this thesis. Quality of life is an all encompassing concept and needs to be narrowed considerably before it can be usefully applied in the context of examining relationships between objective dimensions and subjective evaluations of the urban environment. Then particular aspects of the broad conceptual model are examined; firstly by reviewing a range of models and findings relevant to general processes underlying subjective urban QOL; and secondly by reviewing models and findings relevant to the specific objective dimensions and subjective evaluations of the urban environment being examined in this thesis. This chapter then concludes with a brief summary.

2.1 What is Quality of Life?

Quality of life is a broad concept with philosophical roots in the study of happiness. Historically, happiness\(^1\) is viewed from either a eudaemonistic or hedonistic philosophical perspective. The eudaemonistic view of happiness can be traced back to Aristotle who recommended living a ‘good and virtuous’ life which leads to a happy and successful life (Aristotle, 1998 [circa 350 BC]). In contrast, the hedonistic view of happiness recommends maximising pleasure or satisfaction which can be traced back to Jeremy Bentham (1998 [1789]) and John Stuart Mill (1998 [1863]) respectively. This thesis focuses on satisfaction.

The broad philosophical perspective adopted in any piece of research has implications for methodology (Crotty, 1998). For example, the eudaemonistic view of happiness is a ‘normative’ view prescribing what should be done to be happy and can lend itself to moralistic approaches; while a hedonistic view focusing on satisfaction is a ‘positive’ view asking what is it that makes one satisfied which lends itself to empirical approaches. Consistent with the latter philosophical view, this thesis adopts an empirical methodology.

Empirical research into QOL began in earnest approximately three decades ago and has grown exponentially since then. In the mid-1970s, two seminal works empirically investigating QOL were published (Andrews & Withey, 1976; Campbell, Converse, & Rodgers, 1976) as well as a seminal work on residential satisfaction (Marans & Rodgers, 1975). In 1973, ‘happiness’ was first listed as an

\(^1\) The term ‘happiness’ was commonly used prior to the term ‘quality of life’.
index term in *Psychological Abstracts International* (‘happiness’ and ‘QOL’ were then used interchangeably) and in 1974, the first journal dedicated to QOL research *Social Indicators Research* was established (Diener, 1984). Since then, empirical research on QOL has grown exponentially with over 35,000 publications being identified in five main electronic databases (S. Evans & Huxley, 2002). Not surprisingly, in 2000 a second international journal dedicated to QOL research was established, *The Journal of Happiness Studies*, and then in 2006 a third international journal was established, *Applied Research in Quality of Life*.

Despite this flurry of empirical QOL research, there is still no generally accepted meaning of QOL nor agreement about how best to measure it, even after considerable debate within the International Society of Quality of Life Studies (see Andelman et al., 1998). However, in the broadest sense QOL means some evaluation of human circumstances.

A related concept to QOL which is well defined and has a generally accepted meaning is subjective well-being (see Diener, 1984; Diener, Suh, Lucas, & Smith, 1999). Subjective well-being has three dimensions: 1) pleasant affect (e.g., joy, elation, contentment or indeed happiness as a feeling); 2) unpleasant affect (e.g., shame, sadness, anxiety etc.); and 3) life satisfaction (either overall life satisfaction or satisfaction in particular life domains). The pleasant and unpleasant affective dimensions can be thought of as positive and negative *feelings*, where as life satisfaction can be thought of as a subjective evaluation or *cognitive judgement*.

Two important distinctions between feelings and judgements are 1) that judgements refer to particular targets or objects; and 2) that judgements are influenced by standards of comparison (Abele & Gendolla, 1999; Campbell, Converse, Rodgers, & Marans, 1976; Kahneman, 1999; Michalos, 1985; Schwarz & Strack, 1999). In contrast, feelings are often generalised and may not be easily related to a specific targets; for example, a depressed or low mood may not relate to any specific target, or may be generalised across all targets (Forgas, 1995).

This thesis focuses on judgements or subjective evaluations (e.g., satisfaction) rather than feelings because subjective evaluations relate to particular targets, including different attributes of the urban environment. For example, if someone evaluates traffic congestion as being ‘very bad’, then the target of the evaluation is traffic congestion. So while subjective well-being includes both judgements and feelings, this thesis focuses on judgements or subjective evaluations, and aims to control for mood biases associated positive and negative moods (see later in this chapter).
2.1.1 Dimensions of QOL Research

In a review of QOL research in urban geography, Pacione (2003) identifies various dimensions of QOL research (see Figure 2-1). In each time slice, there are two different planes: the objective and subjective planes which relate to objective and subjective measures of QOL. Objective and subjective QOL may also vary by social group. In addition, each of these objective and subjective planes has two other dimensions: geographic scale and levels of specificity.

Figure 2-1. A five dimensional framework for QOL research

Looking at the levels of specificity on the subjective plane in Figure 2-1, whole life may be conceptualised as satisfaction with overall life, which consists of satisfaction across a range of important life domains (e.g., satisfaction with work, relationships, community etc.). There is a plethora of research studying satisfaction in each of the main life domains. For example, satisfaction with work (e.g., Hart, 1999; Heller, Judge, & Watson, 2002); relationships (e.g., Acock & Hurlbert, 1993; D. Evans, Pellizzari, Culbert, & Metzen, 1993; Foroughi, Misajon, & Cummins, 2001); health (e.g., John, 2004; Michalos, Hubley, Zumbo, & Hemingway, 2001); as well as satisfaction with housing, neighbourhood, community, and region (e.g., Cook, 1988; Marans & Rodgers, 1975; McCrea, Stimson, & Western, 2005; Parkes, Kearns, & Atkinson, 2002; Sirgy & Cornwell, 2001, 2002; Turksever &
Atalik, 2001). This thesis examines satisfaction in the last group of life domains for residents living in urban environments rather than examining overall life satisfaction in urban environments.

2.2 Urban Quality of Life

In conceptualising urban QOL, a distinction needs to be made between QOL derived from the urban environment (i.e., satisfaction derived in urban domains such as housing, neighbourhood, community and region) and QOL experienced in urban environments (which would include satisfaction across all life domains; e.g., work, relationships, health, neighbourhood etc.). In this thesis, the notion of urban QOL is limited to QOL derived from the urban environment since the research questions relate to links between objective dimensions and subjective evaluations of the urban environment.

Limiting the scope of this study to urban domains focuses on the relationships between residents and their urban environment. Extending the scope to include all life domains would have weakened the focus on these relationships since overall QOL is also influenced by many life domains not associated with the urban environment. Thus, the scope in this paper is limited to examining subjective urban QOL conceptualised as satisfaction in various urban domains.

2.2.1 Objective Urban QOL

QOL can be measured either subjectively or objectively (see Figure 2-1) and there is debate about which approach is best (see Andelman et al., 1998). So both approaches are reviewed, as well as providing a rationale for linking objective characteristics and subjective evaluations of urban environments. As noted in the Introduction, urban QOL research usually focuses on either an objective or subjective approach, resulting in a research gap in the literature (see Figure 2-2, reproduced from Chapter 1)

**Figure 2-2. A research gap in the urban QOL literature**

Source: the author, reproduced from Chapter 1
While this thesis also uses objective indicators of urban environments, it does so with the aim of linking these to subjective evaluations of the urban environment, whereas proponents of an objective urban QOL approach would use objective indicators of the urban environment with the aim of deriving estimates of objective urban QOL for places (see Figure 2-2).

Objective urban QOL research actually incorporates a number of approaches. The social indicators approach is the simplest approach where mainly objective indicators of the urban environment on such things as pollution, traffic flows, house prices, etc. are monitored separately with the main purpose of measuring trends over time or achieving objective standards (e.g., Archibugi, 2001; Cicerchia, 1996; D'Andrea, 1998; Perz, 2000). While there have been calls to include subjective indicators on an equal basis as objective indicators (see Cutter, 1985; Diener & Suh, 1997; Marans, 2003; Santos & Martins, 2007), the social indicators approach mostly uses objective indicators.

The most common approach for deriving estimates of objective urban QOL for places is weighting objective indicators of the urban environment so as to rank places by objective urban QOL (see Boyer & Savageau, 1981, 1985, 1989; Cutter, 1985; Liu, 1975; Savageau & D'Agostino, 1999). However, these weighting systems have often been criticised because of their seemingly ad hoc nature and because the place rankings can change markedly by using an alternative set of weights (Cutter, 1985; Landis & Sawicki, 1988; Rogerson, Findlay, Morris, & Coombes, 1989). Such criticisms raise questions about the objectivity of objective urban QOL estimates.

In efforts to derive more objective weights for estimates of urban QOL of places, hedonic price equations have been used to estimate objective urban QOL for ranking places (e.g., Blomquist, Berger, & Hoehn, 1988; Stover & Leven, 1992). These models use implicit amenity prices as theoretical weights for amenities which is argued to be a more objective weighting system. However, these weights may also be criticised because they rely on a range of assumptions that can be challenged (e.g., households maximize their well-being and markets accurately reflecting a trade off between land costs, wages and amenity values). Moreover, there is a question about whether the weights should be ‘objective’.

In an innovative study by Rogerson, Findlay, Morris, and Coombes (1989), the authors derived a subjective set of weights by taking the average subjective importance of various attributes of the urban environment obtained from a national opinion survey. They then used these averages to weight objective attributes of places so as to produce a ranked list of QOL in British cities. This, in part, recognises the subjective nature of urban QOL. However, in averaging subjective importance measures across residents, these estimates of urban QOL also smooth over individual variations in what
residents consider subjectively important in the urban environment. Thus, any resident may disagree with the rankings of urban QOL for British cities.

This is a limitation which is true of all the weighting systems for ranking places, regardless of how weights are derived and highlights the ultimately subjective nature of urban QOL. So while estimating objective urban QOL for places may have particular uses for ranking places and monitoring change in objective urban QOL over time, it is important to recognise the ultimately subjective nature of urban QOL, and consequently to try and understand the links between objective characteristics and subjective evaluations of the urban environment.

2.2.2 Subjective Urban QOL

In this thesis, the concept of subjective urban QOL refers to satisfaction in urban domains: housing, neighbourhood, community and regional satisfaction. The three most commonly studied urban domains are housing satisfaction, neighbourhood satisfaction, and community satisfaction (e.g., Bruin & Cook, 1997; Campbell, Converse, Rodgers, & Marans, 1976; Lu, 1999; Parkes, Kearns, & Atkinson, 2002; Sirgy & Cornwell, 2002). However, regional satisfaction is much less studied (e.g., McCrea, Stimson, & Western, 2005; Turksever & Atalik, 2001). Regions may be viewed as areas consisting of various communities linked together by a shared geography (e.g. a shared water catchment area), by shared organisations (e.g. regional development organisations), and by shared major service centres (e.g. Brisbane City in the centre of the SEQ region).

2.2.2.1 Relationships between the Urban Domains

Rather than being distinct, these four urban domains have been found to be very interrelated. While housing satisfaction is not surprisingly predicted by features of the home – for example, dwelling age, size, structure and tenure (Campbell, Converse, Rodgers, & Marans, 1976; Lu, 1999) – housing satisfaction is also predicted by surrounding features such as neighbours, housing in the local area, and community size (Campbell, Converse, Rodgers, & Marans, 1976; Lu, 1999; Parkes, Kearns, & Atkinson, 2002). Housing satisfaction is also predicted by community satisfaction (Campbell, Converse, Rodgers, & Marans, 1976) and even by regional characteristics such as geographic location within the metropolitan region (Lu, 1999). Thus, housing satisfaction is linked not only with attributes of the house, but also with the surrounding urban environment.

Neighbourhood satisfaction is predicted by a wide range of physical, economic, and social features of neighbourhoods (for a review, see Sirgy & Cornwell, 2002), as well as being linked to satisfaction in other urban domains such as housing satisfaction and community satisfaction. Sirgy and
Cornwell (2002) found that satisfaction with neighbourhood economic features was also a good predictor of housing satisfaction, and that satisfaction with neighbourhood social features was a good predictor of community satisfaction. Campbell et al. (1976) also found neighbourhood and community satisfaction to be strongly related.

Community satisfaction, neighbourhood satisfaction and housing satisfaction all seem to be interrelated (Sirgy & Cornwell, 2002). For example, relationships with neighbours predicts each of these three urban domains (Campbell, Converse, Rodgers, & Marans, 1976; Lu, 1999; Turksever & Atalik, 2001). However, community satisfaction is more related to neighbourhood satisfaction than housing satisfaction (Campbell, Converse, Rodgers, & Marans, 1976).

As already mentioned, regional satisfaction is not a commonly studied domain in subjective urban QOL. However, in a study conducted by Turksever and Atalik (2001) a range of factors predicted both regional and community satisfaction (health, climate, crowding, sporting facilities, housing conditions, and environmental pollution). Only overcrowding and travel to work were uniquely related to regional satisfaction. Thus, regional satisfaction is also associated with satisfaction in other urban domains.

Even though subjective urban QOL is often researched using different urban domains, it is clear that satisfactions in different urban domains are interrelated. This is reflected in the conceptual model used in this thesis with two way arrows shown between the different urban domains (see Figure 2-3, reproduced from Chapter 1). Because of these interrelations, subjective urban QOL can be viewed in this thesis as a composite of housing, neighbourhood, community and regional satisfaction.

2.2.2.2 Subjective Urban QOL and Objective Indicators of the Urban Environment

This thesis adopts a subjective urban QOL approach while also incorporating objective indicators of the urban environment. Using objective indicators does not necessarily constitute an objective urban QOL approach. There is a distinction between using objective indicators of the urban environment and objective urban QOL. Even though objective indicators of the urban environment may be used to form a measure of objective urban QOL by weighting the indicators, they are not being used in this way in this thesis. Instead they are viewed as contributing to subjective evaluations of the urban environment.

This strategy is consistent with the conceptual model used in this thesis where satisfaction in urban domains and subjective evaluations of various attributes of the urban environment are seen to be originally stemming from the objective environment (see Figure 2-3). Thus the conceptual model
provides the underlying rationale for linking objective characteristics and subjective evaluations of the urban environment, with urban QOL ultimately viewed as subjective.

Figure 2-3. Model of determinants of satisfaction with the residential environment

Source: adapted from Campbell, Converse, Rodgers and Marans (1976); reproduced from Chapter 1

2.3 General Models and Findings Relating to Subjective Urban QOL

This broad conceptual model, based on seminal work by Marans, Rodgers, Converse and Campbell (Campbell, Converse, Rodgers, & Marans, 1976; Marans & Rodgers, 1975), can accommodate other models relating to various parts of this broad model. In this section, some of these other models are reviewed because of their general applicability to subjective urban QOL (i.e., bottom-up models, top-down models, mood bias models, subjective judgement models, adaptation models, individual and social group difference models, and residential relocation models).

2.3.1 Bottom-Up Models

The model of subjective urban QOL in Figure 2-3 incorporates a bottom-up model where satisfactions in urban life domains (e.g., housing satisfaction, neighbourhood satisfaction, and community satisfaction) are predicted by satisfactions with urban sub-domains (e.g., neighbourhood
services, neighbourhood friendliness, etc. may predict neighbourhood satisfaction). These models are called bottom-up models because more specific subjective evaluations are used to predict more global subjective evaluations.

Subjective urban QOL studies commonly use bottom-up models (e.g., Campbell, Converse, Rodgers, & Marans, 1976; Cummins, 1996; Ibrahim & Chung, 2003; Marans & Rodgers, 1975; McCrea, Stimson, & Western, 2005; Michalos & Zumbo, 1999; Sirgy & Cornwell, 2001, 2002; Sirgy, Rahtz, Cicic, & Underwood, 2000). However, subjective evaluations of the urban environment must also ultimately relate to objective characteristics of the urban environment for them to have meaning since it is the objective urban environment upon which the subjective evaluations are based. Despite this, few bottom-up models of subjective urban QOL are extended to link subjective evaluations with objective characteristics of the urban environment (e.g., Campbell, Converse, Rodgers, & Marans, 1976; Galster & Hesser, 1981; Marans & Rodgers, 1975; McCrea, Shyy, & Stimson, 2006). As mentioned, this thesis focuses on this research gap.

### 2.3.2 Top-Down Models

Top-down models predict satisfaction with overall life and satisfaction in life domains from personality characteristics such as extroversion, neuroticism and self-esteem (Diener, 1984; Diener, Suh, Lucas, & Smith, 1999; Hart, 1999; Hayes & Joseph, 2003; Vitterso, 2001; Vitterso & Nilsen, 2002). They reflect stable individual differences which influence subjective evaluations (Headey & Wearing, 1989), and may be incorporated in Figure 2-3 by the arrow from personal characteristics to satisfaction in urban and other life domains.

While satisfaction judgements can be influenced by both bottom-up and top-down effects (Lance, Lautenschlager, Sloan, & Varea, 1989; Lance, Mallard, & Michalos, 1995; Michalos & Zumbo, 1999), this thesis does not directly control for the influence of individual differences in personality because of a lack of relevant data. However, some personality traits are partly controlled by virtue of being correlated with mood (see below).

### 2.3.3 Mood Bias Models

Another individual difference is mood which has found to bias a wide variety of subjective judgements including persuasion (Petty, Schumann, Richman, & Strathman, 1993), stereotyping (Roesch, 1999), self-conceptions (Sedikides, 1995), as well as life satisfaction (Abele & Gendolla, 1999; Schwarz & Clore, 1983; Schwarz & Strack, 1999; Schwarz, Strack, Kommer, & Wagner, 1987). Mood bias is controlled in this thesis using measures for positive and negative affect, and this also
assists in controlling for personality since positive and negative affect are highly correlated with the personality traits of extroversion and introversion respectively (for a review, see Diener, Suh, Lucas, & Smith, 1999).

However, mood bias may affect subjective evaluations of the urban environment less than it affects subjective urban QOL. There are two main theories about how mood bias influences subjective judgements which are based on two different cognitive mechanisms. According to the ‘affect-as-information’ mechanism, positive and negative moods may be used as information in forming subjective judgements. More specifically, we may consult our feelings in response to a question and use this information when making a response (Clore & Tamir, 2002; Schwarz & Clore, 1988; Schwarz & Strack, 1999). Further, we may consult our feelings more with more complex and less specific judgements (e.g., judgements about overall subjective urban QOL) because consulting our feelings can be used as a simplifying heuristic to reduce the cognitive burden associated with more complex judgements (Schwarz & Strack, 1999). Conversely, we may consult our feelings less with less complex and more specific subjective evaluations of the urban environment since these evaluations are not as cognitively burdensome.

In contrast, the ‘affect priming’ mechanism suggests that overall subjective urban QOL as well as specific subjective evaluations of the urban environment would be influenced by mood bias to a similar extent. In this theory, memory connections involve a network of affective associations; and so a positive or negative mood state primes or pre-activates positive or negative memory connections, consistent with current mood (Bower, 1981; M. S. Clark & Williamson, 1989; Forgas, 1995). Accordingly, positive moods facilitate easier retrieval of positive memories (via a pre-activated memory network) and similarly negative moods facilitate easier retrieval of negative memories when making subjective judgements, irrespective of the complexity or specificity of a judgement.

There is debate about which mechanism (affect-as-information or affect priming) is the main mechanism underlying mood bias (see Forgas, 2002a, 2002b; Schwarz, 2002). However, whether mood bias influences specific subjective evaluations of the urban environment to the same extent as overall subjective urban QOL is an empirical question which can be answered in this thesis.

2.3.4 Subjective Judgement Models

Subjective judgement models may be incorporated into the broad conceptual framework shown in Figure 2-3 via standards of comparison. Michalos (1985) reviews a wide range of theories which incorporate standards of comparison into subjective judgements models; for example, aspirations theory, equity theory, cognitive dissonance theory, reference group theory and social comparison
theory. Moreover, subjective judgement theories are commonly used in QOL research (e.g., Abele & Gendolla, 1999; Brickman & Campbell, 1971; Brickman, Coates, & Janoff-Bulman, 1978; Marans & Rodgers, 1975; Meadow, Mentzer, Rahtz, & Sirgy, 1992; Michalos, 1985, 1986; Schwarz, Strack, Kommer, & Wagner, 1987; Wright, 1985)

Subjective judgement models hypothesise that subjective evaluations depend on the difference between attributes of a judgement target and standards of comparison rather than simply on attributes of a judgement target alone. Thus, individual variations in standards of comparison have the potential to significantly influence subjective evaluations. For example, two residents may evaluate the same urban environment differently (e.g., one positively and one negatively) by virtue of having different standards. Since standards of comparison have the potential to significantly influence subjective evaluations in a way that weakens relationships between objective dimensions and subjective evaluations of the urban environment, subjective judgement models are examined in Chapter 5 on psychological processes, where they are reviewed and explained in more detail.

2.3.5 Adaptation Models

Although not reflected in Figure 2-3, adaptation is another psychological process examined in Chapter 5 which may potentially weaken relationships between objective dimensions and subjective evaluations of the urban environment. With adaptation, a resident’s perceptions and standards of comparison merge over time such that initially strong positive or negative subjective evaluations become more moderate over time. If a resident’s perceptions become equal their standards of comparison, then the resident will simply be satisfied since their expectations are met.

Kahneman (1999) proposes that perceptions and standards of comparison can merge over time by two different processes: 1) by adjusting sensory perceptions, where for example initially striking perceptions of an urban environment may become less noticeable over time with increasing familiarity with the urban environment (termed the ‘hedonic treadmill’); and 2) by adjusting standards of comparison; where for example, standards become increasingly influenced by everyday expectations associated with living in a particular urban environment (termed the ‘satisfaction treadmill’).

Empirical evidence has been found for adaptation in various life domains (for a review, see Diener, Lucas, & Scollon, 2006). However, it is not clear how important adaptation is in urban domains, which has implications for planning urban and whether positive changes in the objective urban environment are associated with long lasting increases in subjective urban QOL (Brickman & Campbell, 1971). Adaptation processes are reviewed further in Chapter 5.
2.3.6 Individual and Social Group Differences

Aside from psychological processes, individual and social group differences in the subjective importance of various attributes of the urban environment may influence links between objective dimensions and subjective evaluations of the urban environment. This is investigated in this thesis by weighting objective dimensions by subjective importance when predicting subjective evaluations of the urban environment, and constitutes novel research since no similar research has been found in the literature.

In contrast, there has been a considerable amount of research on weighting satisfaction in life domains or sub-domains by their subjective importance when predicting more global subjective evaluations of satisfaction. This subjective weighting of subjective evaluations is encapsulated in Figure 2-3 in the arrow from personal characteristics to relationships between subjective evaluations and satisfaction in urban domains. However, there is lively and continuing debate as to whether it is necessary to weight subjective evaluations by subjective importance when predicting more global subjective evaluations (Hsieh, 2003, 2004; Trauer & Mackinnon, 2001; Wu & Yao, 2006b).

Most research has shown that weighting subjective evaluations by importance does not significantly improve prediction of satisfaction in more global domains (e.g., Andrews & Withey, 1976; Campbell, Converse, Rodgers, & Marans, 1976; Cummins, McCabe, Romeo, & Gullone, 1994; Mastekaasa, 1984; e.g., Russell, Hubley, Palepu, & Zumbo, 2006). Some authors suggest this is because subjective evaluation measures include a component of subjective importance since very positive or very negative subjective evaluations inherently imply a high level of subjective importance (Trauer & Mackinnon, 2001; Wu & Yao, 2006a). However, this argument seems less applicable to weighting objective dimensions of the urban environment since objective indicators do not inherently imply a component of subjective importance in their measurement. Thus, individual and social group differences in subjective importance of various attributes of the urban environment may assist in explaining relationships between objective dimensions and subjective evaluations of the urban environment. This is examined in Chapter 6.

2.3.7 Residential Relocation Models

The residential relocation process is reflected in intentions to move in Figure 2-3, though another arrow may have been drawn from intentions to move back to the objective characteristics of the urban environment in a feedback loop. In this thesis, residential relocation is of interest because differences in the subjective importance of various attributes of the urban environment may also
influence the links between objective dimensions and subjective evaluations of the urban environment by influencing where residents choose to live.

There are two main approaches to examining residential relocation: macro and micro approaches (Golledge & Stimson, 1997). Macro approaches use aggregated secondary data to examine population flows between places, usually by examining asymmetric patterns in flows between places of origin and destination (Quigley & Weinberg, 1977). However, macro approaches focus on aggregated objective data for places, and so are of limited use in examining links between objective dimensions and subjective evaluations of the urban environment.

In contrast, micro-approaches focus more explicitly on the processes underlying residential relocation; and can be classified as either functionalist or behaviourist (Golledge & Stimson, 1997). Functionalist approaches make *simplifying assumptions* about underlying residential relocation decision processes in order to model residential relocation outcomes. These simplifying assumptions are usually based on maximising utility by rational residents and on market based principles, with theories falling into three main types – minimising travel cost; trading off travel cost and housing cost; and maximising housing expenditure (Balchin, Kieve, & Bull, 1995) – and more recently, trading off housing quality and location status (Phe & Wakely, 2000). However, functional approaches have limited usefulness in explaining links between objective dimensions and subjective evaluations of the urban environment because simplifying assumptions, by definition, do not detail the underlying cognitive processes involved in choosing a new residential location. Conversely, detailing the underlying cognitive processes has more potential to explain links between these relationships.

Behavioural approaches *describe or examine* in more detail the underlying cognitive processes of residents during the residential relocation process. These behavioural approaches may relate to either longer distance relocation (e.g., interstate) or shorter distance relocation (e.g., intra-urban). Push-pull models generally focus on longer distance relocation (e.g., Longino, Perzynski, & Stoller, 2002; Stimson & McCrea, 2004; Walmsley, Epps, & Duncan, 1998) and are not reviewed here. This thesis adopts a behavioural model which focuses on describing and examining processes underlying intra-urban residential relocation in detail.

An early and detailed behavioural model of intra-urban residential relocation was put forth by Brown and Moore (1970) (see Figure 2-4). In this model, the intra-urban residential relocation process is classified into two main phases: deciding *whether to move* and deciding *where to move*. In deciding whether to move (Phase I), residents compare their objective residential environment with their subjective needs and aspirations. If their cognitive appraisal is unfavourable, a resident becomes dissatisfied with their place utility and may decide to move. In deciding where to move (Phase II), a
resident formulates their criteria for evaluating and choosing a new residential location based on the subjective importance they place on various attributes of the urban environment as well as their needs and aspirations, though their needs and aspirations may be reviewed and adjust as part of the residential search process.

Figure 2-4. A behavioural model of the residential relocation process

This basic model can be extended in various ways: by incorporating the costs of moving into the decision to move or stay (e.g., Fredland, 1974; Speare, Goldstein, & Frey, 1975); by taking into consideration the effect of social norms and institutional constraints on intentions to move (e.g., Desbarats, 1983); and by extending the notion of residential preferences into preferred residential lifestyles (e.g., Ge & Hokao, 2006). However, the basic residential relocation process is still encapsulated in this basic model (see Golledge & Stimson, 1997; Pacione, 1990) where residents...
choose where they live based on what is subjectively important to them, subject to any constraints which may result in adjusting needs and expectations.

As mentioned, Brown and Moore’s model divides the residential relocation process into two stages: deciding whether to move and deciding where to move (see Figure 2-4). The main factor underlying decisions about whether to move are changing household space requirements, especially relating to life course changes. This the main finding in Rossi’s seminal work on Why Families Move (Rossi, 1955) and since then, a body of research has confirmed the role of changing housing space requirements in the decision to move (e.g., W. A. V. Clark & Huang, 2003, 2004; W. A. V. Clark & Ledwith, 2006). However, once deciding to move, neighbourhood attributes play an important role in deciding where to move, even though a residential location is not chosen independently of housing considerations (Dieleman & Mulder, 2002).

In choosing where to move, a resident may consider many things; for example, proximity to workplace, family, and good schools; and housing affordability (Chiang & Hsu, 2005; W. A. V. Clark, Deurloo, & Dieleman, 2000; Kim, Horner, & Marans, 2005). In a recent study of the subjective importance of attributes of the urban environment in choosing residential locations, Ge and Hokao (2006) examined a wide range of subjective importance variables for residents in two Japanese cities. Principal Component Analysis showed four main types of consideration: (1) characteristics of the dwelling, (2) access to services and facilities, transportation and work, (3) urban problems such as pollution and safety, and (4) leisure opportunities and social relationships. However, items for social considerations appeared under-represented in this study.

This basic two phase model by Brown and Moore (1970) encapsulates the residential relocation process and also provides a detailed account of the cognitive and decision making processes involved in residential relocation compared to some later models (e.g., Amerigo & Aragones, 1997; Desbarats, 1983). So this model is adopted in Chapter 7 to explore the potential effects of residential relocation on links between objective dimensions and subjective evaluations of the urban environment.

### 2.4 Models and Findings Relevant to the Objective Dimensions and Subjective Evaluations of the Urban Environment

While many of the general processes examined in the previous section have the potential to weaken relationships between objective dimensions and subjective evaluations of the urban environment, this section reviews models and evidence relating to particular objective dimensions and subjective evaluations being examined in this thesis (see Table 2-1 below, reproduced from Chapter 1).
This section reviews models and evidence relating to the physical urban environment and then the social urban environment.

Table 2-1. Objective dimensions and subjective evaluations of the urban environment examined for South East Queensland

<table>
<thead>
<tr>
<th>Objective dimensions of the physical environment</th>
<th>Associated subjective evaluations of the urban environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective access</td>
<td>Subjective access</td>
</tr>
<tr>
<td>Objective density</td>
<td>Subjective overloading</td>
</tr>
<tr>
<td>Objective rural environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective dimensions of the social environment</td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective nuclear family households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective older non-nuclear households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td>Subjective social environment</td>
</tr>
</tbody>
</table>

Source: the author, reproduced from Chapter 1

2.4.1 The Physical Environment

2.4.1.1 Optimal Centrality Theory

Optimal Centrality Theory (Archibugi, 2001; Cicerchia, 1999) relates urban density, access to services and facilities, and overloading of urban structure. The theory postulates that there is an optimum urban scale or urban size which maximises trade-offs between the benefits of ‘city effect’ and costs of ‘urban load’ (see Figure 2-5). City effect relates to access to opportunities, services and facilities available by virtue of a city’s size, while urban load relates to negative consequences of urban growth (e.g. congestion, overcrowding, cost of housing, and environmental degradation).
The theory postulates that there will be net benefits to urban QOL as small urban centres grow and additional services and facilities are provided to a growing critical mass of residents, while at the same time relatively low costs are incurred in terms of increased urban load. However, as urban growth continues past the optimum, the rate of increase in city effect slows and the rate of increase in urban load quickens, eventually leading to urban ‘overload’ where additional growth is hypothesised to decrease urban QOL.

This theory can be extended from considering the influence of urban scale on urban QOL to considering the influence of urban density on urban QOL. As with urban scale, urban density can be associated with increasing access to services and facilities and also associated with increasing urban problems such as pollution, traffic congestion and cost of housing. Using this extended theoretical framework, objective density should be positively related to both subjective access and subjective overloading.

### 2.4.1.2 Access to Services and Facilities

Access to services and facilities is an important component of subjective urban QOL (Glaeser, Kolko, & Saiz, 2000; Rogerson, Findlay, Morris, & Coombes, 1989; Rogerson, Findlay, Paddison, & Morris, 1996). For example, community satisfaction has been predicted by the provision services and facilities such as education services, emergency services, public transport, parks, shopping, and leisure opportunities (e.g., Campbell, Converse, Rodgers, & Marans, 1976; Sirgy & Cornwell, 2001; Sirgy,
Satisfaction with access to services and facilities is also important in making residential location decisions (e.g., Chiang & Hsu, 2005; Dokmeci & Berkoz, 2000; Ge & Hokao, 2006; Mitrany, 2005). However, despite the well established connection between subjective access to services and facilities and subjective urban QOL, little research has been conducted examining the strength of relationships between broad objective access and subjective access in urban environments.

This thesis examines the strength of relationships between objective access and subjective access in terms of proximity to services and facilities generally and satisfaction with access to services and facilities generally. Even though subjective access involves more than proximity to services and facilities, proximity is a main component of access and so a moderately strong relationship is expected between objective and subjective access. However, the relationship may be weakened by any of the processes discussed in the previous sections such as individual social group differences in the subjective importance of access to various services and facilities (e.g., Dokmeci & Berkoz, 2000; Kim, Horner, & Marans, 2005).

2.4.1.3 Urban Density and Overloading

High density and rapidly growing urban environments have been associated with increased economic, social and environmental stress (Perz, 2000; Schwirian, Nelson, & Schwirian, 1995), and previous research shows that most residents prefer lower density urban environments (D. L. Brown, Fuguitt, Heaton, & Waseem, 1997; Cramer, Torgersen, & Kringlen, 2004; Filion, McSpurren, & Appleby, 2006; Schwanen & Mokhtarian, 2004; Senecal & Hamel, 2001). However, high density and rapid population growth have also been found to be strong predictors of subjective QOL (Baldassare & Wilson, 1995). This apparent contradiction may be explained by Optimal Centrality Theory whereby residents living in higher density urban environments have better access to services and facilities (Mitrany, 2005) that more than compensates for increasing urban load. However, this would presumably not occur past a point of urban overload.

A wide range of problems associated with urbanisation impact negatively on subjective urban QOL such as pollution, loss of natural areas, traffic congestion, and cost of housing (e.g., see Kemp et al., 1997; Marans, 2002; McCrea, Stimson, & Western, 2005). However, rather than examining these urban problems individually, in this thesis these urban problems are examined at a broad level by examining relationships between objective density and subjective overloading where the latter is a composite measure of a range of urban problems associated with urban density and growth (see Chapter 3 on data and methodology).
2.4.1.4 The Natural Environments

Close proximity to natural environments (e.g., rural and coastal environments) has been found to facilitate recovery from stress (Berto, 2005; Kaplan, 1995; Ulrich, Simons, Losito, Fiorito, & et al., 1991). This is in contrast to higher levels of stress frequently found in more dense and crowded urban environments (for a review, see Walmsley, 1988). So preferences for suburban and low density living may in part be explained by an attraction to natural environments for their restorative effects on stress associated with urban living (van den Berg, Hartig, & Staats, 2007). Thus, close proximity to rural and coastal environments are expected to be associated with favourable subjective evaluations of the natural environment which is expected to be positively associated with subjective urban QOL.

Notwithstanding these general expectations, preferences for the natural environment does vary between residents (Vogt & Marans, 2004). For example, families with children are more likely to prefer neighbourhoods with green space and recreational opportunities in choosing where to live (Kim, Horner, & Marans, 2005). So differences in individual preferences and residential location choices may weaken any relationships found between proximity to natural environments and subjective evaluations of the urban environment.

2.4.2 The Social Environment

Subjective evaluations of the social environment are related to subjective urban QOL via the satisfaction of social needs such as favourable neighbourly relations, social capital, and a sense of community (Davidson & Cotter, 1991; Farrell, Aubry, & Coulombe, 2004; Sirgy & Cornwell, 2002; Western & McCrea, in press), which are also interrelated with each other. Social capital which incorporates trust and reciprocity (Coleman, 1988; Putnam, 1995) is part of favourable neighbourly relations, along with general friendliness between neighbours. Sense of community incorporates a faith that needs would be meet through a shared commitment and a sense of belonging (D. W. McMillan & Chavis, 1986) and is also related to neighbourly relations (Farrell, Aubry, & Coulombe, 2004; Prezza, Amici, Roberti, & Tedeschi, 2001). This interrelatedness of these concepts supports examining the subjective social environment as a broad construct in this thesis.

The broad objective social dimensions of the urban environment examined in this thesis were based on dimensions found in a study by Western and Larnach (1998) (see Table 2-1). Objective dimensions of social environments found in factorial ecologies commonly relate to household structure, socioeconomic status, and ethnicity (for a review, see Western & Larnach, 1998). In their factorial ecology of the social and spatial structure of SEQ, they also found these objective dimensions, as well
as a dimension for disadvantage (relating to unemployment, single parenthood and public housing) which was independent of socioeconomic status.

2.4.2.1 Social Disorganisation Theory

Social Disorganisation Theory (SDT) can be used to theoretically link objective dimensions and subjective evaluations of the social environment. SDT predicts that neighbourhood social ties would be stronger (i.e., more organised) in neighbourhoods that are more stable (e.g., lower residential mobility); more affluent (e.g., more community facilities and resources); less disadvantaged (e.g., fewer social problems) and more ethnically homogeneous (e.g., fewer ethnic minorities) (Lowenkamp, Cullen, & Pratt, 2003; Sampson & Groves, 1989; Shaw & McKay, 1942). Even though SDT is normally associated with studying the effects of social organisation on juvenile crime via the impact of informal social control over youths and their development (Cullen & Agnew, 2003; Kubrin & Weitzer, 2003), SDT can also be used in studying how objective social dimensions may impact on subjective evaluations of the social environment since ‘socially organised’ neighbourhoods are theorised to have favourable neighbourly interactions and a sense of community.

When testing SDT, relationships have been found between objective social dimensions and subjective evaluations of the social environment. For example, less social capital and sense of community have been found in more disadvantaged neighbourhoods (Cantillon, Davidson, & Schweitzer, 2003; Kawachi, Kennedy, & Wilkinson, 1999); less social cohesion among neighbours has been found in disadvantaged and less residentially stable neighbourhoods (Sampson, Raudenbush, & Earls, 1997); and higher neighbourhood attachment and involvement has been found in higher class and more residentially stable neighbourhoods (R. B. Taylor, 1996). However, the direct effects of objective social dimensions on subjective evaluations of the social environment have not been strong.

2.4.2.2 Subculture Theory

Variations in objective social dimensions may be associated with different subcultures. Subculture Theory postulates that in urban environments the population becomes large enough for the formation of subcultures to manifest spatially by allowing residents with similar social backgrounds and lifestyles to live in close proximity (Savage, Warde, & Ward, 2003) The formation of subcultures may stem from consumption of similar services and facilities by similar residents. An example is gentrification of areas where residents of higher socioeconomic status displace or replace those of lower socioeconomic status so as to access services and facilities associated with high end consumption patterns (e.g., good restaurants, theatres, book stores etc) (e.g., E. Clark, 2005; Lees, 2000).
Gentrification of areas may express itself differently depending on the life course of gentrifiers and their consumption patterns; for example, the studentification and greenification of areas (Smith & Holt, 2007; Smith & Phillips, 2001); though more generally speaking, residents with similar life course and housing careers tend to choose similar areas in which to live (e.g., W. A. V. Clark, Deurloo, & Dieleman, 2006; W. A. V. Clark & Huang, 2003). Subcultures may then become associated with local areas via the spatial concentration of residents with similar social backgrounds, lifestyles, values and consumption preferences. Consequently, where residents live becomes an important source of identity for individuals (Butler, 2007).

Once areas become associated with particular subcultures, subcultures can become a factor in residential location decisions (Glavac & Waldorf, 1998; Savage, Warde, & Ward, 2003). This is driven by a preference of many residents to live in neighbourhoods with similar others, which is a form of homophily2 (see Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001; Savage, Bagnall, & Longhurst, 2005). This in turn enhances the generation of intra-urban spatial variation in subcultures (Fischer, 1984) as opposed to a more general urban way of life (see Simmel, 1950; Wirth, 1938).

The relevance of urban subcultures and homophily to this thesis is that they may assist in explaining weak relationships between objective social dimensions and subjective evaluations of the social environment. As with other dimensions of the urban environment, the strength of relationships may depend on the extent to which residents consider an attribute of the urban environment is important. However, with objective social dimensions, the subjective importance of living in neighbourhoods with similar people also relates to the social characteristics of residents themselves. For example, residents considering that living near similar others is important may evaluate the social environment more favourably if they live in a neighbourhood which has social dimensions similar to their own social characteristics. This type of homophily is what Lazarsfeld and Merton (1954) call ‘status homophily’; however, the term ‘social homophily’ is used in this thesis to reflect that social characteristics are not limited to status; they can relate to a range of demographic and socioeconomic characteristics.

Lazarsfeld and Merton (1954) also distinguish between status (or social) homophily and ‘value homophily’. Intra-urban spatial variation in subcultures may not only develop around social characteristics of residents; they may also develop around different values and lifestyles (e.g., Curry,

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2 Homophily can be encapsulated in the phrase ‘birds of a feather flock together’ (McPherson, Smith-Lovin, & Cook, 2001) and literally means as love of the same.
Koczberski, & Selwood, 2001; Ge & Hokao, 2006; Walmsley, Epps, & Duncan, 1998). While these two types of homophily are not mutually exclusive, this thesis focuses on examining the role of social homophily based on social characteristics of residents due to data availability. However, social homophily seems most relevant to examining relationships between the objective social dimensions and subjective evaluations of the social environment.

2.5 Summary

This thesis takes an empirical approach to examining relationships between objective dimensions and subjective evaluations of the urban environment. Even though urban QOL can be measured either objectively or subjectively, this thesis views urban QOL as ultimately subjective, consistent with the conceptual model used in examining links between objective dimensions with subjective evaluations of the urban environment. Subjective urban QOL is conceptualised as satisfaction in various urban domains (e.g., housing, neighbourhood, community, and regional satisfaction) rather than overall life satisfaction which takes into account all life domains (e.g., work, health, partner, standard of living etc.) since the former relates better to examining links between objective dimensions with subjective evaluations of the urban environment.

A range of theories and findings were reviewed relating to particular objective dimensions and subjective evaluations of the urban environment, as well as range of theories and findings relating to more general processes which may impact on relationships between objective dimensions and subjective evaluations of the urban environment. The potential impacts of these more general processes on these relationships raises a question as to the strength of direct links between objective dimensions and subjective evaluations of the urban environment. This question is examined in Chapter 4 after describing the data and methodology in the next chapter. Questions about the impacts of the general processes are then examined in subsequent chapters.
Chapter 3  Data and Methodology

This chapter describes the datasets, measures and methods used to examine links between objective dimensions and subjective evaluations of the urban environment. Measures for objective dimensions and subjective evaluations of the urban environment come from different datasets with different units of analysis. So the most basic methodological problem becomes one of linking different datasets which is accomplished using Geographic Information Systems (GIS). This basic problem of linking datasets geographically may also assist in explaining why relatively little research has been undertaken examining objective and subjective measures in the urban life domain as compared to other life domains where objective and subjective measures often have the same unit of analysis being the individual (e.g., individual income and satisfaction with individual income).

This chapter begins by describing objective and subjective datasets, where the former relate to objectively measured attributes of the urban environment and the latter relates to subjective evaluations of the urban environment made by residents. Next, the novel way in which the objective and subjective datasets were linked using GIS technology is described. The main measures constructed for use in later analyses are then described, before presenting descriptive statistics and spatial distributions for these measures. Finally, the reasons are explained for selecting Generalised Linear Modelling (GLM) as the main statistical method for analysing relationships between objective characteristics and subjective evaluations of the urban environment and subjective urban QOL.

3.1 Datasets

This thesis uses data from various secondary datasets relating to the South East Queensland (SEQ) region, Australia\(^1\). These datasets are the 2003 Survey of Quality of Life in South East Queensland (the 2003 QOL Survey); various GIS based datasets; and Basic Community Profiles from the 2001 Census of Population and Housing (Australian Bureau of Statistics, 2001a).

3.1.1 The 2003 Survey of Quality of Life in South East Queensland

The subjective data for this study came from the 2003 QOL Survey, conducted from March to May, 2003, collecting data from 1,610 residents living in SEQ aged 18 years and over (Western, Stimson, & Mullins, 2003). The survey questions covered many aspects of QOL including questions on satisfaction, problems, attitudes, and importance of various attributes of urban living in SEQ. Other

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\(^1\) The study area was described in Chapter 1, though from a technical perspective, the region consists of the Moreton and Brisbane Statistical Divisions in the Australian Standard Geographic Classification (Australian Bureau of Statistics, 2001a)
questions included information on journeys to and from work; frequencies of various recreational, cultural and entertainment activities; social interactions; and downshifting (trading off income for better QOL life). Overall, the 2003 QOL Survey asked 81 questions, and a copy of the questionnaire and dataset is available from the Australian Social Sciences Data Archive (ASSDA) website\(^2\).

All 1,610 respondents to the 2003 QOL Survey answered a core set of questions. However, to reduce the length of the survey and the respondent burden, a set of non-core questions was asked of approximately half the sample while another set of non-core questions was asked of the other half. This meant the sample size was approximately halved for analyses including non-core questions.

The 2003 QOL Survey was funded by the Australian Research Council (DP0209146) and conducted at the University of Queensland by the Centre for Research into Sustainable Urban and Regional Futures (CR-SURF) and the University of Queensland Social Research Centre (UQSRC). The author was involved at each stage of the survey, employed as a research officer on the project.

The 2003 QOL Survey used a geographically stratified random sampling methodology. First, SEQ was divided into 10 geographical zones of interest (see Table 3-1). Then, residents in each zone were randomly selected so a good geographic coverage of SEQ was gained and so at least 100 residents were sampled in smaller zones (e.g., Brisbane - Inner, Sunshine Coast and Rural Hinterland zones). The resulting spatial distribution of residents sampled in the 2003 QOL survey is shown in Figure 3-1.

### Table 3-1. Number of residents sampled by zone

<table>
<thead>
<tr>
<th>Zone</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane - Inner</td>
<td>101</td>
<td>6</td>
</tr>
<tr>
<td>Brisbane - Middle</td>
<td>251</td>
<td>16</td>
</tr>
<tr>
<td>Brisbane - Outer</td>
<td>227</td>
<td>14</td>
</tr>
<tr>
<td>Logan-Redland-Beaudesert</td>
<td>180</td>
<td>11</td>
</tr>
<tr>
<td>Ipswich City</td>
<td>192</td>
<td>12</td>
</tr>
<tr>
<td>Caboolture, Pine Rivers and Redcliffe</td>
<td>168</td>
<td>10</td>
</tr>
<tr>
<td>Gold Coast - Inner</td>
<td>116</td>
<td>7</td>
</tr>
<tr>
<td>Gold Coast - Outer</td>
<td>144</td>
<td>9</td>
</tr>
<tr>
<td>Sunshine Coast</td>
<td>123</td>
<td>8</td>
</tr>
<tr>
<td>Rural Hinterland</td>
<td>108</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>1610</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: the 2003 QOL Survey

Figure 3-1. The spatial distribution of residents sampled in the 2003 QOL Survey

Legend

- Sampled residents
- Highway
- Railway

Source: the author
Residents were randomly selected from each zone using a sampling frame of private telephone numbers. This sampling frame included both listed and unlisted telephone numbers for each zone, together with names and residential addresses. The residents were interviewed over the telephone using Computer Assisted Telephone Interviewing (CATI). The telephone interview was 40 minutes in duration on average and an overall response rate of 30 percent was achieved, being the number of completed interviews divided by the number of completed interviews plus refusals.

The final sample data was weighted by age, sex and zone to derive representative estimates for SEQ as a whole based on counts from the 2001 Census of Population and Housing (Australian Bureau of Statistics, 2001a). This was done by first cross-classifying both the sample and census population for SEQ by age (10 year groupings) by sex (male, female) by zone (see Table 3-1). Weight for each cell in the cross-classification was calculated by dividing the population falling in each cell by the sample falling in each cell. Each sampled resident was then given the weight of the cell in which it fell.

However, even the unweighted characteristics of sample closely resembled those of the population. Table 3-2 compares the unweighted socioeconomic and demographic characteristics of the 2003 QOL Survey sample with those of the SEQ population as a whole using data from the 2001 Census of Population and Housing. The characteristics are very similar, though the residents surveyed were, on average, more likely to have a higher household income and education; more likely to be employed; and more likely to be living in a separate house.

3.1.2 GIS Based Datasets

Various GIS database layers from MapInfo Street Pro8 (MapInfo, 2003) were used to provide location data, as at May 2003. The ‘Features’ layer was used to calculate distances from each resident’s home to a range of services and facilities (e.g., shopping centres, sporting facilities, hospitals and schools). The ‘Streets’ and ‘Highways and Main Roads’ layers were merged and used to locate residential addresses and to calculate road density around each resident’s home. Finally, the ‘Ocean’ layer was used to calculate the distance of each resident’s home to the coast.

A GIS database was also used to identify the land use for each land parcel in SEQ, as at December 2002 (Queensland Department of Local Government Planning Sport and Recreation, 2002). This unpublished GIS database amalgamated zoning information provided by local government authorities in SEQ to a level which provided consistent land use categories across local government boundaries. This information was used in this thesis to exclude respondents living in rural environments from analyses (see Methodology below) as well as being used to calculate the distance of
each resident from rural and rural-residential land use areas. This GIS dataset was provided free of charge by the Queensland Department of Local Government, Planning, Sport and Recreation.

Table 3-2. Comparison of sample and population characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>The 2003 QOL Survey</th>
<th>The 2001 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age of those aged 18 and over</td>
<td>46</td>
<td>43</td>
</tr>
<tr>
<td>Percentage female of those aged 18 and over</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>Percentage married or in a de facto relationship</td>
<td>60</td>
<td>56</td>
</tr>
<tr>
<td>Percentage divorced, separated or widowed</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Percentage born in Australia</td>
<td>77</td>
<td>73</td>
</tr>
<tr>
<td>Percentage indigenous</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Percentage with post-school qualifications</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>Percentage with a bachelors degree or higher qualification</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>Median individual income of those aged 20 and over (’000)</td>
<td>26.0</td>
<td>23.7</td>
</tr>
<tr>
<td>Median household income (’000)</td>
<td>57.2</td>
<td>43.7</td>
</tr>
<tr>
<td>Percentage employed of those aged 18 and over</td>
<td>65</td>
<td>59</td>
</tr>
<tr>
<td>Percentage employed full-time of those aged 18 and over</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Percentage of dwellings as separate houses</td>
<td>84</td>
<td>75</td>
</tr>
<tr>
<td>Percentage of dwellings as townhouses/units/flats or semi-detached houses</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>Percentage of employed persons working from home</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Percentage of employed persons travelling to work by train</td>
<td>82</td>
<td>83</td>
</tr>
</tbody>
</table>

Sources: the 2003 QOL Survey and Australian Bureau of Statistics (2001a)

3.1.3 The 2001 Census of Population and Housing

Data from the 2001 Census of Population and Housing (the population census) was extracted from datasets known as Basic Community Profiles (BCPs) at the Census Collection District (CCD) geographic level (Australian Bureau of Statistics, 2001a). CCDs cover about 225 dwellings on average (enabling them to be managed by census collectors) and are the smallest geographic area used by the Australian Bureau of Statistics. They can be thought of as local neighbourhood areas.

The BCPs contained demographic and socioeconomic data for CCDs, as well as the area of CCDs for density data. The Census data was then linked to geocoded residential addresses of survey
respondents using a GIS and the digitised CCD boundaries (Australian Bureau of Statistics, 2001b) (explained in more detail below).

3.2 Methodology

3.2.1 Linking Subjective and Objective Datasets

A novel methodological approach was employed in this thesis whereby subjective and objective datasets were linked using Geographic Information Systems (GIS). This involved obtaining residential addresses of respondents, geocoding these addresses, and relating the subjective and objective datasets using GIS.

It was important to obtain accurate residential addresses including street number so that the subjective responses from respondents could be effectively related to objective characteristics of the urban environment. Although, the sampling frame from which telephone number were randomly selected did include residential address information, the level of accuracy of this information was not expected to be high due to residential address changes. So a question asking respondents for their residential addresses was added to the survey. Because some respondents may have been reluctant to provide their residential address, a straightforward explanation was given as to why it was needed and how it would be used:

This information will enable us to map and calculate the distances between residences and locations of local parks, shopping centres, city centres, etc to get a better understanding of what influences quality of life. The address is converted into a map reference as in a street directory, and then your address is deleted.

Only 22 from 1,610 respondents (or 1.4%) declined to provide their residential address. Of those addresses provided, 20 percent did not match those in the sampling frame, in which case the residential addresses provided by respondents were used instead of the addresses on the sampling frame.

These residential addresses were then ‘geocoded’ or located on a GIS digital street map for SEQ using MapInfo Professional GIS and the MapInfo StreetPro database. Over 90% of addresses (1,471) were able to be located and associated with digital street data using automated techniques in GIS. Of the remaining addresses, virtually all of them (130) were able to be geocoded manually, giving a total of 1,601 geocoded addresses which were represented as point data on a GIS layer.
The resident data point layer included respondent identification numbers from the 2003 QOL Survey so that data derived from geoprocessing could be associated with subjective survey responses. Geoprocessing was used to calculate straight line distances from a resident’s homes to various features in the urban environment. Road densities were calculated using geoprocessing by taking a 1 km buffer (or radius) around each residential address and summing the length of enclosed road segments. Population census data was associated with survey responses by overlaying digitised Census Collection District (CCD) polygons onto the resident data point layer so as to link survey response numbers with CCD numbers. Survey responses from residents were then able to be associated with demographic and socioeconomic data as well as household and population density data relating to their CCD.

3.2.2 Excluding Residents in Rural Environments

Not all residents surveyed were used in analyses. Residents living on land zoned as rural were excluded; only those living in urban environments were in the scope of this thesis examining urban QOL. Residents living on land zoned as rural-residential were included in the scope because they were considered part of the urban fringe. Also included were residents who were living in towns because their residential environment was considered primarily urban, even though towns may have been located in the rural hinterland.

These inclusions and exclusions were made using GIS by overlaying the geocoded data points of residential addresses onto a GIS layer of land uses. Using this technique, the final sample size was 1,518 residents living in urban environments.

3.3 Measures

This thesis examines links between objective dimensions and subjective evaluations of the urban environment as they relate to subjective urban QOL. The following subsections describe how measures for each of these objective dimensions and subjective evaluations were constructed (see Table 3-3, reproduced from Chapter 1), as well as how measures for subjective urban QOL and mood bias were constructed.
Table 3-3. Objective dimensions and subjective evaluations of the urban environment

<table>
<thead>
<tr>
<th>Objective dimensions of the physical environment</th>
<th>Associated subjective evaluations of the urban environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective access</td>
<td>Subjective access</td>
</tr>
<tr>
<td>Objective density</td>
<td>Subjective overloading</td>
</tr>
<tr>
<td>Objective rural environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective dimensions of the social environment</td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective nuclear family households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective older non-nuclear households</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td>Subjective social environment</td>
</tr>
</tbody>
</table>

Source: the author, reproduced from Chapter 1

3.3.1 Subjective Measures

Each subjective measure was constructed by taking the mean of various items measured on Likert scales. Using the mean meant that these subjective measures were on the same scale as the responses items which aided with interpreting of results. For example, a mean of 4.4 for subjective urban QOL could be interpreted as being more than satisfied with urban QOL on average (i.e., a score of 4 would correspond to being ‘satisfied’). These means were based on valid responses for each item. Invalid responses were excluded from mean calculations (i.e., responses of ‘don’t know’ and ‘not applicable’). Therefore, subjective measures only had missing data for residents who had invalid responses on all items associated with a measure.

Subjective access refers to satisfaction with access to services and facilities generally rather than particular services and facilities. Access to particular services and facilities involves issues apart from distance to those services and facilities (available parking, proximity to public transport, opening hours etc.). However, using a broad notion of subjective access, issues of access relating to particular services and facilities are less important because their effects are averaged over a range of services and facilities.
Subjective access was measured as the mean of 10 items relating to satisfaction with access to various services and facilities. The items used the same 5-point scale where 1 was ‘very dissatisfied’, 2 ‘dissatisfied’, 3 ‘neither satisfied nor dissatisfied’, 4 ‘satisfied’ and 5 ‘very satisfied’. The items were: access to a post office; bank, building society etc.; supermarket; hospital; general practitioner; parks or open space; sporting facilities; child care facility; primary school; and secondary school. This measure had no missing values and a coefficient alpha of .85.

Some items were not applicable to every resident, especially schools and childcare facilities. However, the mean subjective access score for each resident was only based on those items applicable to each resident.

Subjective overloading refers to subjective evaluations of various problems associated with increasing urbanisation and rapid population growth. Using Optimal Centrality Theory (Archibugi, 2001; Cicerchia, 1999), subjective loading is hypothesised to worsen with increasing urban density in a trade-off with increasing access to services and facilities.

Subjective overloading was measured as the mean of 10 items relating to how much of a problem were various issues in SEQ: air pollution; noise pollution; discharge of waste into rivers, the bay and the sea; loss of natural places for fish and wildlife to live; loss of natural areas generally; traffic congestion; the cost of housing; the current cost of living; urban sprawl; and the high rate of population growth in SEQ. These items used a 5-point scale where 1 was ‘not much of a problem’, 2 ‘a small problem’, 3 ‘somewhat of a problem’, 4 ‘a great problem’ and 5 ‘a very great problem’. This measure had no missing values and a coefficient alpha of .81.

Subjective natural environment refers to a subjective rating of the natural environment in SEQ. Urban environments contain stressors such as the items mentioned in subjective overloading, and higher levels of stress are commonly found in more dense and crowded urban environments (for a review, see Walmsley, 1988). In contrast, natural environments facilitate recovery from stress (Berto, 2005; Kaplan, 1995; Ulrich, Simons, Losito, Fiorito, & et al., 1991). So residents should have more favourable subjective evaluations of the natural environment if they regularly receive restorative benefits from the natural environment against stressors of urban living (e.g., by living near natural environments).

The subjective natural environment was measured using a single item where residents were asked to rate the natural environment in SEQ using a 5-point scale where 1 was ‘very poor’, 2 ‘poor’, 3 ‘neither good nor poor’, 4 ‘good’, and 5 ‘very good’. This measure had 3 missing values. No coefficient alpha is available for single item measures.
Subjective social environment refers to subjective evaluations of social relationships within a resident’s neighbourhood and community. It includes subjective evaluations relating to favourable neighbourly relations, social capital, and a sense of community which have all been found to contribute to subjective urban QOL (Davidson & Cotter, 1991; Farrell, Aubry, & Coulombe, 2004; Sirgy & Cornwell, 2002; Western & McCrea, in press). These specific subjective evaluations are all interrelated (e.g., Farrell, Aubry, & Coulombe, 2004; Prezza, Amici, Roberti, & Tedeschi, 2001).

The subjective social environment was measured as the mean of 4 items. The first item asked residents to what extent they trusted their neighbours (who were not friends or family) to act in their best interests, where 1 was ‘not at all’, 2 ‘hardly at all’, 3 ‘a little’, 4 ‘to some extent’ and 5 ‘to a great extent’. The other three items asked residents the extent to which they agreed with the following statements: people in this neighbourhood are willing to help each other out, my neighbours are friendly people, and there is a strong sense of community in this neighbourhood, where 1 was ‘strongly disagree’, 2 ‘disagree’, 3 ‘neither agree nor disagree’, 4 ‘agree’, and 5 ‘strongly agree’. This measure had 1 missing value and a coefficient alpha of .75.

Subjective urban QOL operates across a range of geographic scales (Marans & Rodgers, 1975; Pacione, 2003) though satisfaction with urban environments is commonly examined individually at specific geographic levels such as housing satisfaction, neighbourhood satisfaction, community satisfaction and regional satisfaction (e.g., Bruin & Cook, 1997; Campbell, Converse, Rodgers, & Marans, 1976; Lu, 1999; McCrea, Stimson, & Western, 2005; Parkes, Kearns, & Atkinson, 2002; Sirgy & Cornwell, 2002). In contrast, this thesis uses a single broad construct of subjective urban QOL encompassing satisfaction at these different geographic levels for various reasons. Firstly, a broad measure of subjective urban QOL was considered sufficient for establishing whether broad objective dimensions and subjective evaluations of the urban environment were related to subjective urban QOL. Secondly, it simplified analyses. And thirdly, satisfaction with urban environments at the different geographic levels have been found to be interrelated with each other (e.g., Campbell, Converse, Rodgers, & Marans, 1976; Lu, 1999; Sirgy & Cornwell, 2002; Turksever & Atalik, 2001).

Subjective urban QOL was measured as the mean of 4 items relating to satisfaction with different urban domains: satisfaction with housing, living in their neighbourhood, living in their local council area, and living in the SEQ region. Even though the last item related to SEQ as a whole, this item was included because experiences of living in SEQ were also considered to be influenced by where one lives. Each of the 4 items was measured on a 5-point scale with 1 indicating ‘very dissatisfied’, 2 ‘dissatisfied’, 3 ‘neither satisfied nor dissatisfied’, 4 ‘satisfied’ and 5 ‘very satisfied’. This measure had no missing values and a coefficient alpha of .60.
The relatively low alpha was likely due to subjective urban QOL being measured as a broad construct across a range of different geographic levels. It is important to keep in mind what coefficient alpha measures so as to avoid overemphasising its importance in the context of measuring broad constructs. Although coefficient alpha is a measure of reliability, it is more specifically a measure of inter-item consistency\(^3\). In the context of this broad measure of subjective urban QOL, a coefficient alpha of .60 indicated that the average correlation between items satisfaction with the urban environment at different geographical levels was .60. This showed the items were interrelated, though broad constructs like this have lower inter-item consistencies because they encompass more heterogeneous items. Where broad constructs consist of more heterogeneous items, test-retest reliability may be more appropriate than internal consistency as a measure of reliability (Cohen & Swerdlik, 1999); that is, the correlation of subjective urban QOL at two successive points in time. However, a test-retest measure of reliability was not available because the sample was only surveyed at one point in time.

Missing values were low for each of the above subjective measures (subjective access = 0 missing values, subjective overloading = 0, subjective natural environment = 3, subjective social environment = 1, and subjective urban QOL = 0). This meant the effective sample size was only reduced by 4 (from 1,518 to 1,514) for analyses involving objective dimensions and subjective evaluations of the urban environment, and subjective urban QOL.

3.3.2 Mood Bias Control Measures

Moods can be distinguished from emotions and affect. Moods are general affective states (e.g., I feel happy or I feel irritable) whereas emotions are usually associated with particular target events or objects (e.g., I felt inspired when… or I felt angry at…) (Forgas, 2002b; Haidt, 2002; Lerner & Keltner, 2000). Affect is a more general term encompassing both moods and emotions, and has relatively independent positive and negative dimensions (Forgas, 1995; Watson, Clark, & Tellegen, 1988).

Mood bias was measured using the Positive and Negative Affect Scale (PANAS) (Watson, Clark, & Tellegen) to control mood bias. The questions asked to what extent respondents were experiencing various feelings ‘at the moment’ using a 5-point scale. These were asked without reference to any target events or objects, so the responses may be more indicative of moods than emotions.

\(^{3}\) It can be thought of as measuring the mean of all possible split-half correlations, where a split half correlation is computed by dividing the items into two equal sized groups, totalling the items in each group, and calculating the correlation between them with a Spearman-Brown adjustment (Cohen & Swerdlik, 1999).
The PANAS measures affect on two dimensions: positive affect (PA) and negative affect (NA). The brief ‘moment’ version was used which has 10 items on each dimension, each item relating to a different feeling (e.g., distressed and irritable for NA, and proud and inspired for PA). The mean was taken of valid responses for each item relating to a dimension. Both of these dimensions have been found to be valid and reliable in previous studies (e.g., Watson, Clark, & Tellegen, 1988). The coefficient alphas for data collected in this thesis were .86 for positive affect and .88 for negative affect.

The items for positive affect and negative affect were part of a non-core set of questions asked of approximately half the sample. Of 743 residents living in urban environments who were asked these questions, 727 valid responses were attained for the positive and negative affect measures. The higher proportion of missing values was presumably due to the more personal nature of the PANAS questions; however, the percentage of missing values was still relatively low (2.2%). For analyses involving positive and negative affect, objective dimensions and subjective evaluations of the urban environment, and subjective urban QOL, the sample size was 724, taking into account missing values on all these measures.

3.3.3 Objective Measures

The objective dimensions of the urban environment were constructed using Principal Component Analysis (PCA), except for the objective coastal environment which had only one item (see below). PCA was used to identify and measure the constructs underlying various related items. Because PCA is sensitive to the size of correlations between items which are in turn sensitive to outliers (Tabachnick & Fidell, 1996), the items associated with each dimension were initially transformed using logarithms and square roots where necessary so they were reasonably normally distributed. Then, separate PCAs were conducted for each objective dimension using the items associated with that particular dimension.

Poorly loading items were discarded from each PCA, and the remaining items all loading well onto the first component of each objective dimension. Only the first component for each dimension was retained since the second components all had eigenvalues less than 1 (see Table 3-4). The individual item loadings for each first component are given in brackets in the descriptions of each objective dimension of the urban environment (see below).
Finally, PCA was used to weight the items associated with each dimension using the regression method in SPSS to construct a single standardised measure for each objective dimension of the urban environment. There were no missing values for these objective measures since they were constructed from items derived by GIS geoprocessing or were from the Census of Population and Housing (Australian Bureau of Statistics, 2001a). These objective dimensions of the urban environment, described below, are divided into objective dimensions of the physical urban environment (both constructed and natural environments) and objective dimensions of the social environment.

### 3.3.3.1 Objective Physical Environment

Most of the objective physical environment measures used straight line distances as an indicator of proximity to various aspects of the urban environment. While using the shortest road route distances may have been more accurate, computing various road routes between each resident and each feature in the urban environment would have been computationally complicated and time consuming for little gain. Both straight line and shortest route distances should be reasonable indicators of the underlying construct of proximity. Conversely, the underlying construct of proximity should predict reasonably well both straight line and shortest road route distances. As such, straight line distances were seen as a
reasonable and practical indicator of proximity. As mentioned, straight line distances between residents’ homes and various aspects of the urban environment were calculated using GIS.

Objective density was the only objective dimension of the urban environment not measured using distances to various aspects of the urban environment. It comprised the number of persons, dwellings, and road length in the immediate area surrounding a resident’s home. The items for each objective dimension of the physical urban environment are detailed below, together with their PCA loadings in brackets.

- **Objective access** used straight line distances from a respondent’s residence to their closest: neighbourhood shopping centre (.67), sub-regional shopping centre (.69), regional shopping centre (.63), commercial area (.62), sporting facility (.61), hospital (.78), primary school (.67), and high school (.76).

- **Objective density** used three items: person density (1.00), dwelling density (.99) and road density (1.00). Person density and dwelling density referred to the number of persons and dwellings per hectare within each resident’s Census Collection District (CCD), while road density referred to the total road length contained within 1 km of a resident’s dwelling, calculated using GIS.

- **Objective rural environment** used two items: the straight line distance from each respondent’s home to the closest land parcel zoned for rural land use (.86), as well as to the closest parcel zoned for rural-residential land use (.86).

- **Objective coastal environment** used one item: the shortest straight line distance between a resident’s home and the coastline. Since only one item was used, it was standardised by subtracting each resident’s score from the mean distance to the coast and dividing this by the standard deviation, rather than standardising using PCA.

### 3.3.3.2 Objective Social Environment

Objective dimensions of the social environment related to the socio-spatial structure of SEQ identified by Western and Larnach (1998). The first three dimensions are related to the prevalence of different household structures in the social environment (i.e., younger non-nuclear households, nuclear family households, and older non-nuclear households), while the last three measures related to socioeconomic, disadvantaged and ethnic dimensions of social environments. These represent the six main objective dimensions by which neighbourhoods vary in SEQ in terms of demographic and socioeconomic characteristics.
These objective social dimensions are commonly found in factorial ecologies of urban environments, though a separate dimension for disadvantaged neighbourhoods is not always identified as independent from the socioeconomic status of neighbourhoods (Western & Larnach, 1998). However, this study of the socio-spatial structure of SEQ identified the objective disadvantaged environment as an independent dimension.

As mentioned above, each objective dimension of the urban environment was constructed using PCA. The items used for objective dimensions of the social environment (detailed below) refer to percentages of the population with various demographic and socioeconomic characteristics within each resident’s CCD area. The component loadings are again shown in brackets.

- **Objective younger non-nuclear households** used 3 items: persons never married (.86); dwellings rented (non-government) (.87); and group households (.90).
- **Objective nuclear family households** used 4 items: two parent family households (.86); persons aged 5-14 (.79); persons aged 0-4 (.52); and dwellings being purchased (78).
- **Objective older non-nuclear households** used 3 items: persons aged 65 or more (.78); lone person households (.92); and persons divorced or separated (.68).
- **Objective socioeconomic environment** used 10 items with capture the socioeconomic status of areas: labour force with graduate qualification (.94); managers and professionals (.92); females employed as professionals (.79); persons employed in finance, property or business services (.80); households with annual income over $78,000 (.77); labour force with no qualifications (-.90); tradesperson (-.74); labourers (-.81); persons employed in manufacturing (-.69); and persons having left school under 15 years of age (-.79).
- **Objective disadvantaged environment** used 5 items: unemployed males (.81); unemployed females (.73); 15-19 year old persons unemployed (.55); dwellings rented (government) (.63); and single parent family households (.70).
- **Objective ethnic environment** used 4 items: persons of non-Christian religions (.86); born in South East Asia (.83); born in Southern and Eastern Europe (.70); and born in Central and South America (.52)
3.4 Descriptive Statistics

3.4.1 Objective Dimensions of the Urban Environment

The objective dimensions are standardised measures from Principal Component Analyses (PCA), so the means and standard deviations were zero and one respectively; and all had reasonable skewness statistics. However, standardised metrics are not very useful for describing samples. A more meaningful way to describe relatively low or high levels on objective dimensions of the urban environment is to describe relatively low or high levels on the items used to construct each objective dimension in their original metrics (i.e. before being transformed for PCA). With skewed distributions, the median (or 50th percentile) is a better indicator of central tendency than the mean, while the 25th and the 75th percentiles are better indicators of relatively low and high levels for each item rather than using standard deviations ($SD$). This is because the mean and $SD$ are influenced by outliers.

Accordingly, each objective dimension of the urban environment is described below using their constituent items measured in their original metrics, where relatively low levels for each item are reflected by the 25th percentile, the average or median levels by the 50th percentile, and relatively high levels by the 75th percentile. For items which were strongly positively skewed, the maximum is also shown in the text in parentheses.

3.4.1.1 Objective Physical Environment

Table 3-5 shows descriptive statistics for items on each objective dimension of the physical urban environment. Residents with relatively high objective access (i.e. the 25th percentiles) can be described as being within a few kilometres of most services and facilities. In contrast, residents with relatively low objective access (i.e., the 75th percentile) can be describes as still being within a few kilometres of some services and facilities but more than 15.51 kilometres away from a regional shopping centre and more than 6.05 kilometres away from the closest hospital. On average, the sampled residents lived relatively close to services and facilities which can be expected in urban environments (see the 50th percentile).
Table 3-5. Descriptive statistics for items relating to objective dimensions of the physical environment

<table>
<thead>
<tr>
<th>Objective physical dimension</th>
<th>Percentiles</th>
<th>25th</th>
<th>50th</th>
<th>75th</th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective access</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closest neighbourhood shopping centre (km)</td>
<td></td>
<td>1.13</td>
<td>1.82</td>
<td>2.82</td>
<td>2.62</td>
<td>3.65</td>
<td>7.10</td>
</tr>
<tr>
<td>Closest sub-regional shopping centre (km)</td>
<td></td>
<td>2.17</td>
<td>3.84</td>
<td>6.14</td>
<td>5.94</td>
<td>7.24</td>
<td>3.26</td>
</tr>
<tr>
<td>Closest regional shopping centre (km)</td>
<td></td>
<td>3.64</td>
<td>6.84</td>
<td>15.51</td>
<td>10.65</td>
<td>9.52</td>
<td>1.64</td>
</tr>
<tr>
<td>Closest commercial area (km)</td>
<td></td>
<td>.23</td>
<td>.45</td>
<td>.77</td>
<td>.68</td>
<td>.90</td>
<td>4.06</td>
</tr>
<tr>
<td>Closest sporting facilities (km)</td>
<td></td>
<td>1.14</td>
<td>1.97</td>
<td>3.23</td>
<td>2.52</td>
<td>2.06</td>
<td>2.39</td>
</tr>
<tr>
<td>Closest hospital (km)</td>
<td></td>
<td>1.68</td>
<td>3.31</td>
<td>6.05</td>
<td>4.68</td>
<td>4.37</td>
<td>1.82</td>
</tr>
<tr>
<td>Closest primary school (km)</td>
<td></td>
<td>.53</td>
<td>.81</td>
<td>1.31</td>
<td>1.08</td>
<td>1.03</td>
<td>6.98</td>
</tr>
<tr>
<td>Closest high school (km)</td>
<td></td>
<td>1.02</td>
<td>1.59</td>
<td>2.61</td>
<td>2.14</td>
<td>1.91</td>
<td>3.58</td>
</tr>
<tr>
<td><strong>Objective density</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person density (persons per ha)</td>
<td></td>
<td>8.10</td>
<td>17.54</td>
<td>25.85</td>
<td>19.17</td>
<td>16.48</td>
<td>3.10</td>
</tr>
<tr>
<td>Dwelling density (dwellings per ha)</td>
<td></td>
<td>2.94</td>
<td>6.43</td>
<td>9.85</td>
<td>7.76</td>
<td>7.92</td>
<td>3.56</td>
</tr>
<tr>
<td>Road density (km of road within 1km)</td>
<td></td>
<td>70.33</td>
<td>113.29</td>
<td>171.83</td>
<td>123.58</td>
<td>72.70</td>
<td>.57</td>
</tr>
<tr>
<td><strong>Objective rural environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closest rural land (km)</td>
<td></td>
<td>.57</td>
<td>1.34</td>
<td>2.80</td>
<td>1.90</td>
<td>1.75</td>
<td>1.29</td>
</tr>
<tr>
<td>Closest rural-residential land (km)</td>
<td></td>
<td>1.45</td>
<td>4.18</td>
<td>8.55</td>
<td>5.39</td>
<td>4.64</td>
<td>.71</td>
</tr>
<tr>
<td><strong>Objective coastal environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to the sea (km)</td>
<td></td>
<td>3.47</td>
<td>11.95</td>
<td>19.59</td>
<td>14.85</td>
<td>14.30</td>
<td>1.48</td>
</tr>
</tbody>
</table>

N = 1,518; km = kilometre


Residents in areas of relatively low objective density can be described as living in neighbourhoods with less than 8.10 persons per hectare and less than 2.94 dwellings per hectare, although they may still have up to 70.33 kilometres of road within a kilometre of their residence. Residents in areas of high objective density can be described as living in neighbourhoods with more than 25 persons per hectare, more than 9.85 dwellings per hectare, and more than 171.83 kilometres of road with a kilometre of their residence. However, the median objective density for these residents
living in urban environments in SEQ was not high (i.e., 6.43 dwellings per hectare, which is equivalent to an area of 100m by 100m or 2.47 acres).

On average, residents in SEQ lived close to the objective rural environment. Those with relatively high objective rural environments were less than .57 of a kilometre away from rural land and less than 1.45 kilometres away from rural-residential land, while those with low objective rural environments were more than 2.80 kilometres from rural land and more than 8.55 from rural-residential land. Residents were often further away from rural-residential land than rural land because much fewer land parcels were zoned for rural-residential land.

Overall, the closeness of SEQ residents to the objective rural environment, on average, can be explained by various factors: rural zoning within urban environments (e.g., market gardening areas), fringe suburbs, narrow coastal strip developments, and towns in rural hinterlands.

Residents were much less likely to be close to the objective coastal environment. Those residents with a relatively high objective coastal environment lived less than 3.5 kilometres from the coast, while those with a relatively low objective coastal environment lived nearly 20 kilometres or more from the coast. However, half the sample lived within 12 kilometres of the coast, reflecting concentrations of residents in urban areas along the coast.

3.4.1.2 Objective Social Environment

Table 3-6 shows descriptive statistics for items associated with objective dimensions of the social urban environment. Resident neighbourhoods (or CCDs) with relatively high objective younger non-nuclear household environments can be described as having over a third of residents never having being married (35.53%), a third or more of dwellings rented (32.59%), and nearly 6 percent of households as group households (5.94%).

Resident neighbourhoods with relative high objective nuclear family environments can be described as having 37 percent or more of households with two parents and dependent children, more than a quarter of residents being children between 0 and 14 years of age (25.15%), and a relatively high proportion of households currently purchasing their own homes (36.81%).
Table 3-6. Descriptive statistics for items relating to objective dimensions of the social environment

<table>
<thead>
<tr>
<th>Objective social dimension</th>
<th>Percentiles</th>
<th>Mean</th>
<th>SD</th>
<th>Skew.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25&lt;sup&gt;th&lt;/sup&gt;</td>
<td>50&lt;sup&gt;th&lt;/sup&gt;</td>
<td>75&lt;sup&gt;th&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear households</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persons never married (%)</td>
<td>26.46</td>
<td>30.61</td>
<td>35.53</td>
<td>32.06</td>
</tr>
<tr>
<td>Dwellings privately rented (%)</td>
<td>14.29</td>
<td>21.27</td>
<td>32.59</td>
<td>24.95</td>
</tr>
<tr>
<td>Group households (%)</td>
<td>2.14</td>
<td>3.55</td>
<td>5.94</td>
<td>4.91</td>
</tr>
<tr>
<td>Objective nuclear family households</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two parent family households (%)</td>
<td>18.04</td>
<td>27.27</td>
<td>37.00</td>
<td>27.84</td>
</tr>
<tr>
<td>Persons aged 0-4 (%)</td>
<td>4.75</td>
<td>6.36</td>
<td>7.87</td>
<td>6.39</td>
</tr>
<tr>
<td>Persons aged 5-14 (%)</td>
<td>10.47</td>
<td>14.11</td>
<td>17.28</td>
<td>13.68</td>
</tr>
<tr>
<td>Dwellings being purchased (%)</td>
<td>18.84</td>
<td>27.17</td>
<td>36.81</td>
<td>28.45</td>
</tr>
<tr>
<td>Objective older non-nuclear households</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lone person households (%)</td>
<td>12.29</td>
<td>19.77</td>
<td>30.13</td>
<td>22.27</td>
</tr>
<tr>
<td>Person divorced/separated (%)</td>
<td>8.89</td>
<td>11.62</td>
<td>14.45</td>
<td>11.94</td>
</tr>
<tr>
<td>Persons aged 65 or more (%)</td>
<td>6.32</td>
<td>10.55</td>
<td>15.75</td>
<td>12.53</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour force with graduate qualifications (%)</td>
<td>5.94</td>
<td>9.57</td>
<td>16.79</td>
<td>12.62</td>
</tr>
<tr>
<td>Managers and professionals (%)</td>
<td>15.50</td>
<td>21.71</td>
<td>30.71</td>
<td>24.36</td>
</tr>
<tr>
<td>Females employed as professionals (%)</td>
<td>13.09</td>
<td>17.78</td>
<td>24.36</td>
<td>19.66</td>
</tr>
<tr>
<td>Finance, property and business services (%)</td>
<td>10.36</td>
<td>13.69</td>
<td>18.40</td>
<td>14.80</td>
</tr>
<tr>
<td>Household income &gt; $78,000 (%)</td>
<td>9.12</td>
<td>15.24</td>
<td>23.22</td>
<td>17.16</td>
</tr>
<tr>
<td>Labour force with no qualifications (%)</td>
<td>49.81</td>
<td>55.77</td>
<td>61.53</td>
<td>55.26</td>
</tr>
<tr>
<td>Tradesperson (%)</td>
<td>9.43</td>
<td>12.83</td>
<td>15.78</td>
<td>12.37</td>
</tr>
<tr>
<td>Labourers (%)</td>
<td>4.99</td>
<td>8.01</td>
<td>11.90</td>
<td>8.95</td>
</tr>
<tr>
<td>Employed in manufacturing (%)</td>
<td>8.11</td>
<td>11.03</td>
<td>15.70</td>
<td>12.15</td>
</tr>
<tr>
<td>Left school &lt;15 yrs (%)</td>
<td>9.75</td>
<td>13.97</td>
<td>19.08</td>
<td>14.63</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment rate - males (%)</td>
<td>4.80</td>
<td>6.90</td>
<td>10.20</td>
<td>7.96</td>
</tr>
<tr>
<td>Unemployment rate - females (%)</td>
<td>5.80</td>
<td>8.30</td>
<td>11.60</td>
<td>9.41</td>
</tr>
<tr>
<td>Unemployment rate – 15 to 19 (%)</td>
<td>8.16</td>
<td>17.24</td>
<td>26.14</td>
<td>18.29</td>
</tr>
<tr>
<td>Dwellings rented (government) (%)</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>3.31</td>
<td>3.46</td>
</tr>
<tr>
<td>Single parent households (%)</td>
<td>5.41</td>
<td>7.79</td>
<td>10.95</td>
<td>8.62</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Christian religions (%)</td>
<td>.94</td>
<td>1.94</td>
<td>3.42</td>
<td>2.78</td>
</tr>
<tr>
<td>Born in South East Asia (%)</td>
<td>.56</td>
<td>1.09</td>
<td>2.07</td>
<td>1.74</td>
</tr>
<tr>
<td>Born in Southern or Eastern Europe (%)</td>
<td>.73</td>
<td>1.46</td>
<td>2.50</td>
<td>1.90</td>
</tr>
<tr>
<td>Born in Central or South America (%)</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.48</td>
<td>.29</td>
</tr>
</tbody>
</table>

Notes: N = 1,518

Source: the author, derived from locations of residents in the 2003 QOL Survey and Australian Bureau of Statistics data

(Australian Bureau of Statistics, 2001a, 2001b)
Neighbourhoods with relatively high objective older non-nuclear household environments can be described as having over 30.13 percent of households occupied by lone persons, over 15.75 percent of residents aged 65 and over, and over 14.45 percent of residents divorced or separated. The variable for persons aged 65 or more was strongly positively skewed with some older non-nuclear household environments having very high percentages of persons aged 65 or over (maximum 93.89%).

Neighbourhoods with a relatively high objective socioeconomic environment can be described as having more than 16.79 percent of their labour force with graduate qualifications, more than 30.71 percent of employed persons working as managers or professionals, more than 24.36 percent of females employed as professional, and more than 23.22 percent of households with income of more than $78,000. These areas have high socioeconomic status.

Conversely, neighbourhoods with relatively low objective socioeconomic environments have low socioeconomic status. They can be described as having less than 5.94 percent of the labour force with graduate qualifications and more than 61.53 percent of the labour force with no formal qualifications, and more than 19.08 percent of residents having left school under the age of 15 years. They can also be described as having more than 15.78 percent of employed persons working as tradespersons, more than 11.90 percent working as labourers, and more than 15.70 percent working in manufacturing.

Neighbourhoods with relatively high objective disadvantaged environments can be described as having relatively high unemployment rates of more than 10.20 percent for males, more than 11.60 percent for females, and more than 26.14 percent for youths 15 to 19 years of age. They can also be described as having more than 10.95 percent of households as single parent households, and more than 3.31 percent of dwellings rented from the government (or public housing). The notions of high objective disadvantaged environments and low objective socioeconomic environments are different in that low socioeconomic areas in terms of low educational levels and occupational status are not necessarily disadvantaged areas in terms of high unemployment, single parent households and welfare dependency.

Neighbourhoods with relatively high ethnic environments can be described as having more than 3.42 percent of residents with non-Christian religions, more than 2.07 percent born in South East Asia, more than 2.50 percent born in Southern or Eastern Europe, and more than .48 percent born in Central or South America. The average percentage of ethnic residents in SEQ neighbourhoods is very low.

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4 The median household income for SEQ was $43,700 in the 2001 (Australian Bureau of Statistics, 2001a).
3.4.1.3 Spatial Distributions

The spatial distributions of the 10 objective dimensions of the urban environment in SEQ are shown in Appendix A. These maps show that objective access and objective density were highest in the major urban centres (Brisbane, Ipswich, the Gold Coast and the Sunshine Coast), lower in suburban areas, and lowest in outer suburbs, rural-residential areas and small towns. An inverse pattern was found for the objective rural environment, while the coastal environment was understandably found along the coast. Younger non-nuclear households were concentrated in major urban centres, nuclear family households were concentrated in middle and outer suburbs, and older non-nuclear households were concentrated in older suburbs and along the coast. The higher socioeconomic areas were concentrated in Brisbane (especially north-west of the Brisbane River and along the river) as well as being concentrated along the coast to a lesser extent. Lower socioeconomic areas were concentrated in a strip of suburbs running eastward from Ipswich; and along the growth corridors out from Brisbane toward the Sunshine Coast and toward the Gold Coast; as well as in some rural-residential areas and small towns. The spatial concentration of disadvantaged areas was similar to that for lower socioeconomic areas except they were not concentrated in rural-residential areas and small towns south of Ipswich and Brisbane. Finally, areas with higher concentrations of ethnic populations were primarily found in the two major urban areas of Brisbane and the Gold Coast, though many ‘high’ concentrations of ethnic populations were only in the order of 2 or 3 percent of residents (see Table 3-6). Overall, the maps in Appendix A show clear spatial patterns in objective dimensions of the urban environment in SEQ that are often interrelated with each other.

3.4.2 Objective Types of Urban Environment

To more fully describe the objective urban environment in SEQ different types of urban environment in SEQ were identified and described. Particular combinations of individual objective dimensions of the urban environment may commonly be found together, giving rise to different types of urban environment.

Different types of urban environment in SEQ were identified using cluster analysis. There are three main families of cluster analytic methods used in the social sciences: hierarchical agglomerative methods, factor analytic methods, and iterative partitioning methods (Aldenderfer & Blashfield, 1984). Since the types of urban environment were not conceptualised in a hierarchical way, a hierarchical method was not chosen. A factor analytic method may have been considered but this option was not available in the SPSS statistical package being used. So the iterative partitioning method was used with the K-Means option in SPSS.
Cluster analyses identify relatively homogeneous *types* by identifying similar patterns of outcomes on a set of variables (i.e., the set of objective dimensions of the urban environment). Firstly, initial locations for K cluster centres are based on an initial pass of the data which identifies K cases that are well separated in the space of the objective dimensions of the urban environment. Secondly, each case is assigned to a cluster based on Euclidean distances to the closest cluster centre, and then each cluster centre is recalculated using the mean values of the cases assigned to it. This second step is continually reiterated, with some cases being reassigned and cluster centres being recalculated, until the changes in cluster centres are negligible.

The number of clusters needs to be initially specified in K-mean cluster analysis. The number of clusters chosen in the final solution was based on each cluster having a mean score close to an absolute value of one on at least one objective dimension of the urban environment in SEQ. This ensured that each cluster had at least one distinctive characteristic being close to one SD above the mean.

After testing a range of solutions from two to six clusters, the four cluster solution was chosen because it was the most informative, producing the largest number of distinctive clusters. The solutions with five or six clusters still only produced four distinctive clusters (which were similar in characteristics to those produced in the four cluster solution) plus two additional clusters without any distinctive characteristics.

The relative importance of each objective dimension of the urban environment in separating the four clusters is shown in Table 3-7 by the relative size of their *F* statistic from the analysis of variance table. The most important characteristic was proximity to the objective rural environment. The next most important was the objective socioeconomic environment, and so on, with the least important characteristic in distinguishing between different types of urban environment in SEQ being the objective ethnic environment. The *F* statistics were highly significant for all the objective dimensions which means that they all varied significantly between clusters.

The four clusters (or four types of urban environment in SEQ) can be described with reference to the mean scores for each cluster on each of the objective dimensions of the urban environment. These mean scores are shown in Table 3-8, though they may be more easily seen graphically as shown in Appendix B.
### Table 3-7. Relative importance of each objective dimension of the urban environment in distinguishing between types of urban environment

<table>
<thead>
<tr>
<th>Objective dimension of the urban environment</th>
<th>$F$ statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective rural environment</td>
<td>703.99</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td>631.36</td>
</tr>
<tr>
<td>Objective nuclear family household environment</td>
<td>520.19</td>
</tr>
<tr>
<td>Objective older non-nuclear household environment</td>
<td>491.33</td>
</tr>
<tr>
<td>Objective density</td>
<td>377.00</td>
</tr>
<tr>
<td>Objective younger non-nuclear household environment</td>
<td>353.04</td>
</tr>
<tr>
<td>Objective access</td>
<td>347.76</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td>325.68</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>294.81</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td>119.93</td>
</tr>
</tbody>
</table>

Notes: N = 1,518  
Source: the author

### Table 3-8. Mean cluster scores for each type of objective urban environment

<table>
<thead>
<tr>
<th>Objective dimension of the urban environment</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective access</td>
<td>-.84</td>
<td>-.09</td>
<td>-.23</td>
<td>.70</td>
</tr>
<tr>
<td>Objective density</td>
<td>.96</td>
<td>.00</td>
<td>.18</td>
<td>-.72</td>
</tr>
<tr>
<td>Objective rural environment</td>
<td>1.16</td>
<td>-.43</td>
<td>.10</td>
<td>-.83</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>.02</td>
<td>.58</td>
<td>-1.04</td>
<td>.19</td>
</tr>
<tr>
<td>Objective younger non-nuclear households</td>
<td>.91</td>
<td>.08</td>
<td>-.13</td>
<td>-.83</td>
</tr>
<tr>
<td>Objective nuclear family households</td>
<td>-.74</td>
<td>.41</td>
<td>-.65</td>
<td>.92</td>
</tr>
<tr>
<td>Objective older non-nuclear households</td>
<td>.26</td>
<td>-.04</td>
<td>.91</td>
<td>-1.02</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td>1.12</td>
<td>-.94</td>
<td>-.31</td>
<td>.07</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td>-.42</td>
<td>.96</td>
<td>.34</td>
<td>-.63</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td>.66</td>
<td>.28</td>
<td>-.37</td>
<td>-.38</td>
</tr>
</tbody>
</table>

Notes: N = 1,518; the mean and SD for each objective dimension were 0 and 1, respectively  
Source: the author
Like the objective dimensions of the urban environment, there were clear spatial patterns found for objective types of urban environment in SEQ (see Figure 3-2). Cluster 1 had good objective access and high objective density, and was relatively far away from objective rural environments. In this cluster, there were relatively high proportions of younger non-nuclear households and relatively low proportions of nuclear family households. The cluster was also associated with relatively high socioeconomic environments and objective ethnic environments. The map in Figure 3-2 shows that this cluster was mainly found in the inner suburbs of Brisbane and the Gold Coast and may be briefly described as ‘higher socioeconomic inner urban areas’.

Cluster 2 had average levels of objective access and objective density. It was more characterised by relatively low objective socioeconomic and relatively high disadvantaged scores. This cluster was mainly found in a strip of suburbs running east from Ipswich and extending to the south eastern growth corridor, as well as being scattered in outer suburbs and small towns. This cluster may be briefly described as ‘disadvantaged suburban areas’.

Cluster 3 was relatively close to the coast with relatively high proportions of older non-nuclear households. Although found mainly along the coast, this cluster also extended into some suburbs north and east of Brisbane. It may be briefly described as ‘older household coastal areas’.

Cluster 4 had relative poor objective access and relatively low objective density, being relatively close to objective rural environments. In this cluster, there were also higher proportions of nuclear family households and lower proportions of older non-nuclear households. This cluster was mainly found in the outer suburbs and rural-residential areas, and may be described as ‘nuclear family outer suburban areas’.

3.4.3 Subjective Evaluations of the Urban Environment and Subjective Urban QOL

Table 3-9 shows descriptive statistics for subjective evaluations of the urban environment and subjective urban QOL, all constructed from items on 5-point Likert scales. Using labels from the Likert scales assists with interpreting descriptive statistics. The italicised words below refer to labels which are associated with values close to the mean scores.
Figure 3-2. Spatial distributions of objective types of urban environment in South East Queensland

- Cluster 1 – Higher socioeconomic inner urban areas
- Cluster 2 – Disadvantaged suburban areas
- Cluster 3 – Older household coastal areas
- Cluster 4 – Nuclear family outer suburban areas

Source: the author
Table 3-9. Descriptive statistics for subjective evaluations of the urban environment

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Skew.</th>
<th>25th</th>
<th>50th</th>
<th>75th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective access</td>
<td>3.98</td>
<td>.63</td>
<td>-.56</td>
<td>3.63</td>
<td>4.00</td>
<td>4.45</td>
</tr>
<tr>
<td>Subjective overloading</td>
<td>3.12</td>
<td>.70</td>
<td>-.18</td>
<td>2.70</td>
<td>3.20</td>
<td>3.60</td>
</tr>
<tr>
<td>Subjective natural</td>
<td>3.92</td>
<td>.84</td>
<td>-.57</td>
<td>3.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
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<td>environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective social</td>
<td>3.57</td>
<td>.80</td>
<td>-.58</td>
<td>3.00</td>
<td>3.75</td>
<td>4.25</td>
</tr>
<tr>
<td>environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective urban QOL</td>
<td>4.14</td>
<td>.57</td>
<td>-.73</td>
<td>3.75</td>
<td>4.25</td>
<td>4.50</td>
</tr>
</tbody>
</table>

Notes: N = 1,514
Source: the author

The mean scores in Table 3-9 indicate that on average residents were satisfied with their access; they considered overloading as somewhat of a problem; rated the natural environment as good on average; they generally agreed with statements indicating favourable evaluations of their social environment; and were more than satisfied with their subjective urban QOL on average. Thus, residents’ subjective evaluations of the urban environment were generally favourable in SEQ, especially with overall subjective urban QOL.

The interquartile ranges (between the 25th and 75th percentiles) and the negative skewness statistics indicated that most responses were favourable, apart from subjective overloading. The distribution for subjective overloading was much more normally distributed.

In contrast to the objective dimensions of the urban environment, the spatial distributions of subjective evaluations of the urban environment and subjective urban QOL showed no clear spatial patterns (see Appendix C). Generally speaking, most residents subjectively evaluated their urban environment and their subjective urban QOL favourably, regardless of where they were living in SEQ. This lack of a clear spatial pattern in subjective evaluations of the urban environment and subjective urban QOL is an indication that direct relationships between objective dimensions and subjective evaluations of the urban environment may be weak.

3.5 Generalised Linear Modelling

The main statistical method used in this thesis to examine links between objective dimensions and subjective evaluations of the urban environment is Generalised Linear Modelling (GLM). This method was chosen for a few main reasons. Firstly, it allows for extraneous variables to be controlled
by entering them in an earlier step (e.g., controlling for mood bias and controlling for alternative explanations). Secondly, controlling for variables allows mediated models to be tested (Baron & Kenny, 1986) which is important for testing some explanations. And thirdly, GLM easily handles interactions between variables, especially between continuous and categorical variables, which is important in testing other explanations. To conduct the GLM analyses, the GLM univariate procedure in SPSS was used.

Path analysis and multiple regression were also considered for the main statistical method; however, examining interactions between continuous and categorical variables are much more difficult in both. Further, multiple regression is mathematically equivalent to GLM, and is in fact a special application of GLM (Tabachnick & Fidell, 1996).

3.6 Summary

This chapter has described the dataset used for subjective evaluations of the urban environment (i.e., the 2003 QOL Survey) and the datasets used for objective dimensions of the urban environment (i.e., a range of GIS based datasets which included urban features and land uses in SEQ, and a range of demographic and socioeconomic data for SEQ from the 2001 Population of Census and Housing).

A novel method was used to link these objective and subjective datasets using GIS. This involved geocoding the residential addresses of survey respondents; using geoprocessing to create a range of variables which related objective characteristics of the urban environment to residential locations of survey respondents; and overlaying Census Collection District polygons onto a layer of residential locations so that survey responses could be associated with surrounding demographic and socioeconomic data. GIS was also used to identify and exclude respondents who fell outside the scope of this thesis (i.e., residents not living in urban environments).

Then the measures were described for the objective dimensions and subjective evaluations of the urban environment, and subjective urban QOL. Firstly, how the measures were constructed was described; and secondly, descriptive statistics and spatial distributions for the measures were provided. These measures are used in following chapters to examine relationships between objective dimensions and subjective evaluations of the urban environment using Generalised Linear Modelling as the main statistical method.
Chapter 4  The Strength of Relationships between Objective Dimensions and Subjective Evaluations of the Urban Environment

4.1 Introduction

Maintaining or enhancing urban QOL is a often cited goal in urban plans, including the SEQ Regional Plan (Office of Urban Management, 2005), and it is often assumed that changes in the physical and social characteristics of urban environments will lead to changes in subjective evaluations of the urban environment and subjective urban QOL. In the broad conceptual model used in this thesis (see Figure 4-1, reproduced from Chapter 1), relationships between objective characteristics and subjective evaluations of the urban environment are complicated by influences of personal characteristics. So, it is important to understand relationships between objective dimensions and subjective evaluations of urban environments.

Figure 4-1. The broad conceptual framework

![Diagram](image)

Source: adapted from Campbell, Converse, Rodgers and Marans (1976); reproduced from Chapter 1

However, it is also important to first establish the strength of any direct relationships between objective dimensions and subjective evaluations of the urban environment so as to test the simplest
explanation of these relationships as well as to provide a base line for comparison with other more sophisticated explanations. Thus, the main aim of this chapter is to examine the first research question (RQ1) ‘What are the strength of direct links between broad objective dimensions and subjective evaluations of the urban environment?’

This chapter also has two secondary aims: 1) to show that the broad subjective evaluations of the urban environment being examined are related to subjective urban QOL, which is done by testing whether they significantly predict subjective urban QOL; and 2) to test the idea that subjective evaluations of the urban environment mediate relationships between objective dimensions of the urban environment and subjective urban QOL, as shown in Figure 4-2.

Figure 4-2. The mediated model of urban QOL

Source: the author

Figure 4-2 is a bottom-up model (like Figure 4-1) where characteristics of the objective urban environment give rise to subjective urban QOL (or satisfaction in various urban domains) via subjective evaluations of the urban environment. Hence, subjective evaluations are conceptualised as
mediating variables. The subjective perceptions shown in Figure 4-1 are not included in Figure 4-2 since no data was available on subjective perceptions (i.e., sensory perceptions of the urban environment). Relationships between subjective sensory perceptions of the urban environment and the objective urban environment are assumed to be relatively direct, and so subjective evaluations of the urban environment should mediate objective dimensions of the urban environment and subjective urban QOL. Figure 4-2 shows the mediated model tested.

4.1.1 Main Hypotheses

This subsection outlines hypotheses associated with the main aim in this chapter while the next subsection outlines hypotheses associated with the secondary aims in this chapter. The main in this chapter is to test the strength of direct relationships between objective dimensions and subjective evaluations of the urban environment. The first four hypotheses listed below relate to objective dimensions of the physical environment.

- Objective access is expected to be negatively associated with subjective access. Distance a main component of access, so shorter distances to services and facilities are expected to be associated with higher satisfaction with access to services and facilities. This hypothesised association also derives from an extension of Optimal Centrality Theory (Archibugi, 2001; Cicerchia, 1999) which hypothesizes that increasing place size is associated with improved access to the number, variety and quality of services and facilities which in turn contributes to urban QOL. However, this theory is modified in this thesis to apply to an intra-urban context in which improved access to the number, variety and quality of services and facilities is associated with increasing urban density and shorter distances or services and facilities.

- Objective density is expected to be positively associated with subjective overloading. This hypothesised association also derives from Optimal Centrality Theory (Archibugi, 2001; Cicerchia, 1999) by extending urban problems associated with increasing place size to those associated with increasing urban density in an intra-urban context. This theory also proposes an optimum trade-off between access and overloading in terms of maximising urban QOL.

- The objective rural environment is expected to be negatively associated with favourable subjective evaluations of the natural environment because being closer to rural environments provides more access to the natural environment. Exposure to the nature environment has been found to have a positive effect on well-being (Berto, 2005; Kaplan, 1995; Ulrich, 1979; Ulrich, Simons, Losito, Fiorito, & et al., 1991).
Similarly, the objective coastal environment is expected to be negatively associated with the subjective natural environment because being closer to coastal environments provides more access to these natural environments.

Regarding the social environment, some objective dimensions of the social environment may be associated with more favourable subjective evaluations of the social environment on average. However, social homophily theory also suggests that any main effects may be weak because more positive subjective evaluations of the social environment are expected when residents live in areas with similar others in terms of social characteristics and more negative subjective evaluations when residents live in areas with dissimilar others (Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001).

Even so, there may be underlying main effects whereby some objective social environments are evaluated more favourably than others on average. Social Disorganisation Theory (SDT) postulates that residents in more ‘socially organised’ neighbourhoods are more willing to exercise informal social control to facilitate positive social outcomes (see Burgess, 1967 [1925]; Lowenkamp, Cullen, & Pratt, 2003; Sampson & Groves, 1989; Shaw & McKay, 1942), and so are more likely to have favourable neighbourly interactions and a sense of community (i.e., a more favourable subjective social environment). Thus, main effects may be hypothesised to the extent that some social dimensions of the urban environment are conducive to forming socially organised neighbourhoods.

Regarding hypotheses for objective social dimensions relating to household structures, favourable subjective evaluations of the social environment are more likely in stable neighbourhoods in terms of residential mobility (e.g., McCulloch, 2003; Sampson, Morenoff, & Earls, 1999; Sampson, Raudenbush, & Earls, 1997; R. B. Taylor, 1996).

- The objective younger non-nuclear household environment is expected to be negatively associated with the subjective social environment because of lower residential stability associated with a higher proportion on younger residents renting their homes.
- In contrast, the objective nuclear family and older non-nuclear family household environments should be positively associated with the subjective social environment because of higher residential stability associated with a higher proportion of residents either purchasing or owning their homes.
Social organisation is also facilitated by resources to support social institutions in the community (e.g., schools, churches, and clubs). Communities in areas of higher socioeconomic status would have more local resources to support local social institutions (e.g., more income, organisational skills, and status). In contrast, disadvantaged environments would have fewer resources within the community to support social institutions, as well as more disruptions to the social institution of family in terms of higher proportions of single parent families.

- The objective socioeconomic environment is expected to be positively associated with the subjective social environment while the objective disadvantaged environment is expected to be negatively associated with the subjective social environment (Cantillon, Davidson, & Schweitzer, 2003; Sampson, Morenoff, & Earls, 1999; Sampson, Raudenbush, & Earls, 1997).

Historically in SDT, ethnically heterogeneous areas are associated with social disorganisation, partly by over representation in ‘zones of transition’ where newly arrived migrants are hypothesised to initially move to more residentially unstable, lower socioeconomic and disadvantaged areas close to the inner city and industry before becoming more affluent and moving to outer suburban areas (Burgess, 1967 [1925]). However, ethnic diversity may also be hypothesised to hinder communication and interaction within a community because of different languages, values, social norms, customs and cultures (Sampson & Groves, 1989; Shaw & McKay, 1942).

- The objective ethnic environment is expected to be negatively associated with the subjective social environment

### 4.1.2 Secondary Hypotheses

This section outlines the hypotheses associated with the two secondary aims in this chapter. The first secondary aim is to show that the subjective evaluations of the urban environment are related to subjective urban QOL to demonstrate to relevance of these four subjective evaluations of the urban environment to subjective urban QOL.

- The subjective evaluations are expected to significantly predict subjective urban QOL.
The other secondary aim is to test the mediated model where subjective evaluations of the urban environment mediate relationships between objective dimensions of the urban environment and subjective urban QOL (as in Figure 4-2).

- The objective dimensions are expected to significantly predict subjective urban QOL, but not when controlling for subjective evaluations of the urban environment.

4.2 Results

The results section consists of two subsections: bivariate analyses and multivariate analyses. In the bivariate analyses, first-order correlations and scatterplots are used to examine the nature and strength of simple bivariate relationships between the objective dimensions and subjective evaluations of the urban environment. In the multivariate analysis, these relationships are further examined, controlling for the effects of mood bias. Also, the mediated model shown in Figure 4-2 is tested. The effective sample size used in analyses in this chapter is 724 since only about half the sample was asked questions relating to mood bias, as explained in Chapter 3 on data and methodology.

4.2.1 Bivariate Analyses

Table 4-1 shows the bivariate correlations between the objective dimensions of the urban environment, subjective evaluations of the urban environment, and subjective urban QOL. Many objective dimensions were moderately correlated with each other. Only a few were not significantly correlated (see row and columns 1 to 10). Similarly, many subjective evaluations are moderately correlated with each other, with few not significant correlated (see row and columns 11 to 14).

In contrast, the correlations between objective dimensions and subjective evaluations of the urban environment were all either low or not significant (see shaded area). Subjective access was not significantly correlated with subjective overloading ($r = -.04, p > .05$) which is interesting given the strong correlation between objective access and objective density ($r = .66, p < .01$). The highest correlations between objective dimensions and subjective evaluations of the urban environment were between objective and subjective access ($r = -.17, p < .01$) and between the objective younger non-nuclear household environment and subjective evaluations of the social environment ($r = -.16, p < .01$).
Table 4-1. Correlations between objective dimensions, subjective evaluations and subjective urban QOL (Pearson’s r)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
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</thead>
<tbody>
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<td>1. Objective access</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>2. Objective density</td>
<td>-.66**</td>
<td></td>
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<td>3. Objective rural environment</td>
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<td>.72**</td>
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<tr>
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<td>-1.8**</td>
<td>-1.5**</td>
<td></td>
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</tr>
<tr>
<td>5. Objective younger non-nuclear households</td>
<td>-.45**</td>
<td>.55**</td>
<td>.54**</td>
<td>.00</td>
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<td></td>
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</tr>
<tr>
<td>6. Objective nuclear family households</td>
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<td>-52**</td>
<td>-54**</td>
<td>.32**</td>
<td>-.53**</td>
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<tr>
<td>7. Objective older non-nuclear households</td>
<td>-.34**</td>
<td>.39**</td>
<td>.33**</td>
<td>-.33**</td>
<td>.38**</td>
<td>-.80**</td>
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<td>8. Objective socioeconomic environment</td>
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<td>.34**</td>
<td>.50**</td>
<td>-.10**</td>
<td>.23**</td>
<td>-.25**</td>
<td>-.12**</td>
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<td>9. Objective disadvantaged environment</td>
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<td>.04</td>
<td>-.13**</td>
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<td>.23**</td>
<td>-.06*</td>
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<td>-.61**</td>
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<td>.34**</td>
<td>.40**</td>
<td>.13**</td>
<td>.36**</td>
<td>-.15**</td>
<td>.00</td>
<td>.13**</td>
<td>.11**</td>
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<td></td>
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<td></td>
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<td>11. Subjective access</td>
<td>-.17**</td>
<td>.11**</td>
<td>.10**</td>
<td>-.07**</td>
<td>.02</td>
<td>-.12**</td>
<td>.12**</td>
<td>.01</td>
<td>.06*</td>
<td>.02</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>12. Subjective overloading</td>
<td>-.01</td>
<td>-.01</td>
<td>-.04</td>
<td>-.03</td>
<td>.00</td>
<td>-.01</td>
<td>.03</td>
<td>-.08**</td>
<td>.05*</td>
<td>-.04</td>
<td>-.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Subjective natural environment</td>
<td>.04</td>
<td>-.01</td>
<td>.02</td>
<td>-.15**</td>
<td>-.04</td>
<td>-.02</td>
<td>.03</td>
<td>.07**</td>
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<td>-.04</td>
<td>.21**</td>
<td>-.17**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Subjective social environment</td>
<td>.10**</td>
<td>-.13**</td>
<td>-.10**</td>
<td>.02</td>
<td>-.16**</td>
<td>.08**</td>
<td>-.06*</td>
<td>.01</td>
<td>-.05*</td>
<td>-.10**</td>
<td>.19**</td>
<td>-.02</td>
<td>.15**</td>
<td></td>
</tr>
<tr>
<td>15. Subjective urban QOL</td>
<td>.02</td>
<td>-.05</td>
<td>.00</td>
<td>-.08**</td>
<td>-.13**</td>
<td>.00</td>
<td>-.01</td>
<td>.09**</td>
<td>-.13**</td>
<td>-.08**</td>
<td>.34**</td>
<td>-.14**</td>
<td>.29**</td>
<td>.47**</td>
</tr>
</tbody>
</table>

Notes: N = 724; * p < .05; ** p < .01

The shaded area represents correlations between objective dimensions and subjective evaluations of the urban environment sources: the author
To check that the low correlations between objective dimensions and subjective evaluations of the urban environment were not due to non-linear bivariate relationships, scatterplots were examined between objective dimensions and subjective evaluations (see Appendix D). These scatterplots did not suggest any non-linear relationships. Thus, the low correlations and scatterplots suggested that relationships between objective dimensions and subjective evaluations of the urban environment were weak.

4.2.2 Multivariate Analyses

Multivariate analyses were undertaken using Generalised Linear Modelling (GLM) which allowed mood bias to be controlled and allowed for the mediated model to be tested. GLM analysis is mathematically equivalent to multiple regression analysis and so assumes linear relationships and returns similar statistics to multiple regression (i.e., the multiple regression coefficient $R^2$, regression coefficients $B$, and significance values $p$) except it uses partial eta squared ($\eta^2$) statistics to show the percentage of variation in the criterion explained by a particular predictor rather than the squared semi-partial correlation ($sr^2$).

Mood bias in subjective evaluations of the urban environment and subjective urban QOL was controlled by entering positive and negative affect as covariates. While controlling for mood bias effectively halved the sample size for analyses (as only half the sample were asked questions on positive and negative affect), the large initial sample size meant that the GLM analysis still had sufficient power to find small effects.

The aims in this chapter are addressed using the following analytical strategy involving 4 steps (which can be read in conjunction with Figure 4-3):

Step 1. Predicting subjective evaluations from objective dimensions of the urban environment (predicting $B$ from $A$ in Figure 4-3)

Step 2. Predicting subjective urban QOL from subjective evaluations of the urban environment (predicting $C$ from $B$)

Step 3. Predicting subjective urban QOL from objective dimensions of the urban environment (predicting $C$ from $A$)

Step 4. Predicting subjective urban QOL from both the objective dimensions and subjective evaluations of the urban environment (predicting $C$ from $A$ and $B$)
Step 1 addresses the main aim of investigating the strength of relationships between objective dimensions and subjective evaluations of the urban environment. Step 2 addresses the secondary aim of showing that the subjective evaluations of the urban environment are relevant to subjective urban QOL by testing how well they predict urban QOL. Steps 1, 3 and 4 are used together to address the secondary aim of testing the mediating model, as reflected in Figure 4-3.

To support the mediating model, three necessary conditions must hold (Baron & Kenny, 1986). Firstly, A must significantly predict B (Step 1). Secondly, A must also significantly predict C (Step 3); Thirdly, B must significantly predict C while controlling for A (Step 4). If these conditions hold, then there is evidence that B mediates the relationship between A and C, at least to some extent, and if A is not significant in Step 4, then there is evidence that B fully mediates the relationship between A and C.

In addition, these multivariate analyses control for mood bias (positive affect and negative affect) which is known to affect a wide variety of subjective judgements (Abele & Gendolla, 1999; Bower, 1981; Forgas, 1995; Schwarz & Strack, 1999). However, this is the first study (to the author’s knowledge) which controls for mood bias in investigating subjective evaluations of the urban environment and subjective urban QOL.

4.2.2.1 Predicting Subjective Evaluations from Objective Dimensions of the Urban Environment (Step 1)

The main aim in this chapter was to examine the strength of direct relationships between broad objective dimensions and subjective evaluations of the urban environment. Table 4-2 shows the results from predicting subjective evaluations from objective dimensions of the urban environment. The relationships between them were very weak, even controlling for mood bias. Only low percentages of the variation in the subjective evaluations of the urban environment were explained by objective dimensions of the urban environment, as shown in the partial $\eta^2$ statistics for each model.
Table 4-2. Parameter estimates for objective dimensions when predicting subjective evaluations of the urban environment, controlling for positive and negative affect

<table>
<thead>
<tr>
<th>Subjective evaluations</th>
<th>Controls</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$p$</th>
<th>Partial $\eta^2$</th>
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<td>Objective access</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Objective access</td>
<td></td>
<td></td>
<td>-11</td>
<td>&lt;.01</td>
<td>2.7%</td>
</tr>
<tr>
<td>Positive affect</td>
<td></td>
<td></td>
<td>.05</td>
<td>.12</td>
<td>.3%</td>
</tr>
<tr>
<td>Negative affect</td>
<td></td>
<td></td>
<td>-12</td>
<td>&lt;.01</td>
<td>1.3%</td>
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<tr>
<td>Subjective overloading</td>
<td></td>
<td>1.9%</td>
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</tr>
<tr>
<td>Objective density</td>
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<td></td>
<td>.03</td>
<td>.33</td>
<td>.0%</td>
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<tr>
<td>Positive affect</td>
<td></td>
<td></td>
<td>.02</td>
<td>.51</td>
<td>.0%</td>
</tr>
<tr>
<td>Negative affect</td>
<td></td>
<td></td>
<td>.17</td>
<td>&lt;.01</td>
<td>2.1%</td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td></td>
<td>4.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective rural environment</td>
<td></td>
<td></td>
<td>-.03</td>
<td>.32</td>
<td>.1%</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td></td>
<td></td>
<td>-.17</td>
<td>&lt;.01</td>
<td>3.4%</td>
</tr>
<tr>
<td>Positive affect</td>
<td></td>
<td></td>
<td>.09</td>
<td>.03</td>
<td>.7%</td>
</tr>
<tr>
<td>Negative affect</td>
<td></td>
<td></td>
<td>-.09</td>
<td>.08</td>
<td>.4%</td>
</tr>
<tr>
<td>Subjective social environment</td>
<td></td>
<td>5.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear household environment</td>
<td></td>
<td></td>
<td>-.16</td>
<td>&lt;.01</td>
<td>2.8%</td>
</tr>
<tr>
<td>Objective nuclear family household environment</td>
<td></td>
<td></td>
<td>.01</td>
<td>.96</td>
<td>.0%</td>
</tr>
<tr>
<td>Objective older non-nuclear household environment</td>
<td></td>
<td></td>
<td>.01</td>
<td>.88</td>
<td>.0%</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td></td>
<td></td>
<td>.09</td>
<td>.03</td>
<td>.7%</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td></td>
<td></td>
<td>.08</td>
<td>.05</td>
<td>.5%</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td></td>
<td></td>
<td>-.03</td>
<td>.42</td>
<td>.1%</td>
</tr>
<tr>
<td>Positive affect</td>
<td></td>
<td></td>
<td>.08</td>
<td>.05</td>
<td>.6%</td>
</tr>
<tr>
<td>Negative affect</td>
<td></td>
<td></td>
<td>-.11</td>
<td>.02</td>
<td>.7%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

Similarly, the $B$ coefficients were all small as well. These can be interpreted as the expected change in a 5-point scale for the subjective evaluation from a 1 $SD$ change in the objective dimensions (note, the objective dimensions were all standardised).
Notwithstanding these small $B$ coefficients, the $p$ values indicated that a number of the objective dimensions significantly predicted subjective evaluations of the urban environment (using a critical $p$ value of .05). They were objective access in predicting subjective access; objective coastal environment in predicting the subjective natural environment; and the objective younger non-nuclear household environment and the objective socioeconomic environment in predicting evaluations of the subjective social environment. However, the percentage of variation in the subjective evaluations explained by these was still very low, as measured by partial $\eta^2$. The highest was only 3.4% of variation in the subjective natural environment explained by the objective coastal environment.

Other objective dimensions were not significant at all. They were objective density in predicting subjective overloading; the objective rural environment in predicting the subjective natural environment; as well as objective nuclear family households, older non-nuclear households, disadvantaged and ethnic environments when predicting subjective evaluations of the social environment.

Positive and negative affect (or mood bias) explained small though significant variation in subjective evaluations of the urban environment, together explaining between 1.3 and 2.1 percent. This is about the same order of magnitude as that explained by significant objective dimensions of the urban environment.

In summary, the strength of relationships between the objective dimensions and subjective evaluations of the urban environment were very weak, even controlling for mood bias. In fact, the objective dimensions of the urban environment explained little more than that explained by mood bias.

4.2.2.2 Predicting Subjective Urban QOL from Subjective Evaluations of the Urban Environment (Step 2)

In Table 4-3 shows the subjective evaluations of the urban environment were all significantly related to subjective urban QOL (i.e. all $p$ values were less than .05). The largest $B$ coefficients were for the subjective social environment (.24) and subjective access (.19). The $B$ coefficients can be interpreted as the expected change in subjective urban QOL from a one unit change in the subjective evaluation of the urban environment. For example, a one unit change in subjective access (say from 4 ‘satisfied’ to 5 ‘very satisfied’) is expected to increase subjective urban QOL by .19 on a 5-point scale.

The partial $\eta^2$ statistics show that subjective evaluations of the social environment explained most variation in subjective urban QOL (14.1%). Subjective access and the subjective natural environment explained similar amounts of variation in subjective urban QOL (5.3 and 4.3%
respectively), while subjective overloading explained a small though significant amount of subjective urban QOL (.9%).

Table 4-3. Parameter estimates for subjective evaluations of the urban environment when predicting subjective urban QOL, controlling for positive and negative affect

<table>
<thead>
<tr>
<th>Subjective evaluations</th>
<th>$B$</th>
<th>$p$</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective access</td>
<td>.19</td>
<td>&lt;.01</td>
<td>5.3%</td>
</tr>
<tr>
<td>Subjective overloading</td>
<td>-.06</td>
<td>.01</td>
<td>.9%</td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td>.13</td>
<td>&lt;.01</td>
<td>4.3%</td>
</tr>
<tr>
<td>Subjective social environment</td>
<td>.24</td>
<td>&lt;.01</td>
<td>14.1%</td>
</tr>
<tr>
<td>Positive affect</td>
<td>.12</td>
<td>&lt;.01</td>
<td>3.5%</td>
</tr>
<tr>
<td>Negative affect</td>
<td>-.11</td>
<td>&lt;.01</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Notes: $N = 724$; adjusted $R^2 = 33.1%$; weighted by age, sex and geographic zone
Source: the author

The controls for mood bias (positive affect and negative affect) also explained significant variation in subjective urban QOL (3.5% and 1.5%, respectively); more than they explained in subjective evaluations of the urban environment. This suggests there more mood bias in subjective urban QOL than more specific subjective evaluations of the urban environment. Together, the four subjective evaluations of the urban environment and the controls for mood bias explained approximately a third of the variation in subjective urban QOL (adjusted $R^2 = 33.1\%$).

4.2.2.3 Predicting Subjective Urban QOL from Objective Dimensions of the Urban Environment (Step 3)

For subjective evaluations of the urban environment to mediate between objective dimensions of the urban environment and subjective urban QOL, it is first necessary for objective dimensions to predict subjective urban QOL.

Only some of the objective dimensions significantly predicted subjective urban QOL (using a criterion of $p < .05$), and their $B$ coefficients and partial $\eta^2$ statistics were very small (see Table 4-4). They were: the objective coastal environment ($B = -.08$, partial $\eta^2 = 1.6\%$), the objective younger non-nuclear household environment ($B = -.07$, partial $\eta^2 = 1.0\%$), the objective older non-nuclear household...
environment ($B = .10$, partial $\eta^2 = .7\%$), and the objective socioeconomic environment ($B = .06$, partial $\eta^2 = .5\%$). Thus, the objective dimensions of the urban environment were either not significant or weak predictors of subjective urban QOL, each explaining less variation than mood bias. This means that any relationships between objective dimensions of the urban environment and subjective urban QOL which may have been potentially mediated were only weak in themselves.

Table 4-4. Parameter estimates for objective dimensions of the urban environment when predicting subjective urban QOL, controlling for positive and negative affect

<table>
<thead>
<tr>
<th>Objective dimensions</th>
<th>Controls</th>
<th>$B$</th>
<th>$p$</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective access</td>
<td></td>
<td>.03</td>
<td>.34</td>
<td>.1%</td>
</tr>
<tr>
<td>Objective density</td>
<td></td>
<td>-.06</td>
<td>.10</td>
<td>.4%</td>
</tr>
<tr>
<td>Objective rural environment</td>
<td></td>
<td>.05</td>
<td>.19</td>
<td>.2%</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td></td>
<td>-.08</td>
<td>&lt;.01</td>
<td>1.6%</td>
</tr>
<tr>
<td>Objective younger non-nuclear household environment</td>
<td></td>
<td>-.07</td>
<td>.01</td>
<td>1.0%</td>
</tr>
<tr>
<td>Objective nuclear family household environment</td>
<td></td>
<td>.06</td>
<td>.18</td>
<td>.3%</td>
</tr>
<tr>
<td>Objective older non-nuclear household environment</td>
<td></td>
<td>.10</td>
<td>.03</td>
<td>.7%</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td></td>
<td>.06</td>
<td>&lt;.05</td>
<td>.5%</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td></td>
<td>-.03</td>
<td>.32</td>
<td>.1%</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td></td>
<td>&lt;.01</td>
<td>.88</td>
<td>.0%</td>
</tr>
<tr>
<td>Positive affect</td>
<td></td>
<td>.16</td>
<td>&lt;.01</td>
<td>4.4%</td>
</tr>
<tr>
<td>Negative affect</td>
<td></td>
<td>-.17</td>
<td>&lt;.01</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

Notes: N = 724; adjusted $R^2 = 13.8\%$; weighted by age, sex and geographic zone
Source: the author

4.2.2.4 Predicting Subjective Urban QOL from Both Objective Dimensions and Subjective Evaluations of the Urban Environment (Step 4)

Step 4 is part of assessing whether subjective evaluations of the urban environment mediated between objective dimensions of the urban environment and subjective urban QOL. Only those predictors which were significant in both Step 1 and Step 3 were selected in this step because only these predictors were still potentially involved in a mediation process.
Table 4-5 shows the estimated parameters for predicting subjective urban QOL from both the selected objective dimensions and their associated subjective evaluations of the urban environment. The $B$ coefficients and partial $\eta^2$ values were slightly higher than in previous steps because of fewer predictors in the models. However, the table shows that these subjective evaluations of the urban environment did not fully mediate the associated objective dimensions when predicting subjective urban QOL because the objective dimensions were still significant when including their associated subjective evaluations (i.e., all $p$’s < .05).

### Table 4-5. Parameter estimates for selected objective dimensions and subjective evaluations of the urban environment when predicting subjective urban QOL, controlling for positive and negative affect

<table>
<thead>
<tr>
<th>Selected subjective evaluation</th>
<th>Selected objective dimension</th>
<th>$B$</th>
<th>$p$</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td>.19</td>
<td>&lt;.01</td>
<td>7.9%</td>
<td></td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>-.07</td>
<td>&lt;.01</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Positive affect</td>
<td>.14</td>
<td>&lt;.01</td>
<td>3.7%</td>
<td></td>
</tr>
<tr>
<td>Negative affect</td>
<td>-.16</td>
<td>&lt;.01</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>Subjective social environment</td>
<td>.27</td>
<td>&lt;.01</td>
<td>15.4%</td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear household environment</td>
<td>-.07</td>
<td>&lt;.01</td>
<td>1.9%</td>
<td></td>
</tr>
<tr>
<td>Objective older non-nuclear household environment</td>
<td>.06</td>
<td>&lt;.01</td>
<td>1.4%</td>
<td></td>
</tr>
<tr>
<td>Objective socioeconomic household environment</td>
<td>.05</td>
<td>&lt;.01</td>
<td>1.1%</td>
<td></td>
</tr>
<tr>
<td>Positive affect</td>
<td>.14</td>
<td>&lt;.01</td>
<td>4.1%</td>
<td></td>
</tr>
<tr>
<td>Negative affect</td>
<td>-.14</td>
<td>&lt;.01</td>
<td>2.8%</td>
<td></td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone

Source: the author

Taking the results from Steps 1, 3 and 4 together, there is little support for the mediated model shown in Figure 4-2. Most objective dimensions of the urban environment were not mediated because they did not have a significant relationship with their associated subjective evaluation of the urban environment or they did not have a significant relationship with subjective urban QOL. The remaining objective dimensions of the urban environment that had significant relationships with both were not
fully mediated by their associated subjective evaluations despite the relationships between these objective dimensions and subjective urban QOL being weak. However, since the subjective evaluations of the urban environment predicted considerable variation in subjective urban QOL, it seems the main reason the mediated model failed was because of weak relationships between objective dimensions and subjective evaluations of the urban environment.

4.3 Summary, Discussion and Conclusions

4.3.1 Summary of Results

The main aim of this chapter was to examine the strength of relationships between objective dimensions and subjective evaluations of the urban environment. These were found to be weak, even when controlling for mood bias. The highest percentage of variation in subjective evaluations of the urban environment directly explained by an objective dimension of the urban environment was 3.4 percent for the objective coastal environment predicting the subjective natural environment. This percentage was only in the same order of magnitude as that explained by mood bias.

The second aim was to show that the subjective evaluations of the urban environment being examined were related to subjective urban QOL, which was found to be so. The subjective evaluations of the urban environment all significantly predicted subjective urban QOL, and together with positive and negative affect, explained 33.1 percent of variation in subjective urban QOL. The subjective social environment was the most important predictor (explaining 14.1%), followed by subjective access and the subjective natural environment (explaining 5.3% and 4.3%, respectively), while subjective overloading only explained a small but significant percentage of variation in subjective urban QOL (explaining .9%).

The third aim in this chapter was to test a mediated model of subjective urban QOL (see Figure 4-2). That is, to test whether subjective evaluations mediated relationships between objective dimensions of the urban environment and subjective urban QOL. There was little support for this mediated model. The objective dimensions of the urban environment were only weakly related to both subjective evaluations of the urban environment and subjective urban QOL. Their weak relationships with subjective urban QOL were likely due to their weak relationships with the subjective evaluations of the urban environment.
4.3.2 Discussion

4.3.2.1 General Discussion

The weak direct relationships between objective dimensions and subjective evaluations of the urban environment suggest that the relationships between them are simply weak or are not direct (i.e. they are indirect). If the underlying nature of the relationships were direct, then these relationships might be expected to be at least moderate in strength. So the weak direct relationships found suggest the possibility of sophisticated indirect processes needing further investigation. These processes may be psychological in nature, or relate to individual and social group differences, or involve residential relocation behaviour, or any combination of these.

Given weak direct relationships between objective dimensions and subjective evaluations of the urban environment, the results provide little support for the mediated model. Since the subjective evaluations of the urban environment are related to subjective urban QOL, the weak link in this mediated model is between objective dimensions and subjective evaluations of the urban environment. Not surprisingly then, relationships are also weak between the objective dimensions of the urban environment and subjective urban QOL. This is essentially a rejection of the naïve model of subjective urban QOL outlined in Chapter 1 (reproduced in Figure 4-4).

Figure 4-4. A naïve model of subjective urban QOL

![Diagram of the naïve model of subjective urban QOL]

Source: the author, reproduced from Chapter 1

However, it was surprising that four objective dimensions of the urban environment still significantly predicted subjective urban QOL when controlling for associated subjective evaluations of the urban environment, even though the effects were small. This implies that these objective dimensions were also related to subjective urban QOL in ways not captured by their associated subjective evaluations.

The objective coastal environment contributed to subjective urban QOL in ways unrelated to subjective evaluations of the natural environment. This stands in contrast to the objective rural environment that did not significantly predict subjective urban QOL. In speculating on some
characteristics of the coastal environment in SEQ that may contribute to subjective urban QOL independently from the natural coastal environment itself (e.g., beaches and the sea), the Gold Coast and Sunshine Coast in SEQ are also known for their recreation, leisure and consumption opportunities, both being popular tourist and retirement destinations.

In contrast, objective rural environments in SEQ have fewer recreation, leisure and other consumption opportunities that may contribute to subjective urban QOL independently of the natural environment. The relative lack of such opportunities may account for the objective rural environment not significantly predicting subjective urban QOL.

The younger and older non-nuclear household environments and the socioeconomic environment also contributed to subjective urban QOL in ways unrelated to subjective evaluations of the social environment. The younger and older non-nuclear household environments had negative and positive influences respectively on subjective urban QOL, which may be associated with more rented accommodation in younger non-nuclear household environments compared to more home ownership in older non-nuclear household environments affecting satisfaction in various urban domains, especially housing and neighbourhood satisfaction. The positive influence of higher socioeconomic environments on subjective urban QOL may also be associated with better housing and residential locations. However, the direct effects of these objective dimensions of the urban environment on subjective urban QOL were relatively small.

4.3.2.2 Particular Relationships between Objective Dimensions and Subjective Evaluations of the Urban Environment

Objective access was significantly related to subjective access and highly correlated with objective density. However, despite the high correlation between objective access and objective density \((r = -.66, p < .01)\), there was no significant corresponding correlation between subjective access and subjective overloading \((r = -.04, p = .09)\). This suggests that relationships in the objective world are not always mirrored in the subjective world, and may reflect the ecological fallacy (Robinson, 1950) where relationships between objective dimensions of the urban environment at a broad regional level may not be reflected in individual subjective evaluations relating to those dimensions. However, it also reflects a consistent finding that objective variables are more closely related with each other than with associated subjective variables at the same level of analysis (for a review, see Cummins, 2000). The weak relationship between subjective access and subjective overloading suggests, in SEQ at least, a potential to increase objective density and subjective access without necessarily increasing subjective overloading significantly (e.g., urban infill projects with positive net effects on subjective urban QOL).
Subjective access also predicted subjective urban QOL more strongly than subjective overloading. In terms of Optimal Centrality Theory (Cicerchia, 1999)\(^1\), this also suggests increasing densification in SEQ has potential to increase subjective urban QOL since subjective access seems more important to residents than subjective overloading, on average, in any trading-off between them when maximising subjective urban QOL. This helps explain increasing urbanisation in SEQ and suggests the region is generally not overloaded in terms of negative net effects on subjective urban QOL\(^2\). However, increasing urbanisation is only expected to have positive net effects on subjective urban QOL up to a point, after which net impacts on subjective urban QOL are expected to be negative (i.e. the point where the two lines intersect in Figure 4-5).

**Figure 4-5. Effects on subjective urban QOL of subjective access and subjective overloading**

![Figure 4-5](image)

Source: adapted from Cicerchia (1999)

Living close to objective coastal environments was associated with favourable ratings of the subjective natural environment, though being close to objective rural environments was not significantly related. This suggests that objective coastal environments have a stronger positive

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\(^1\) Note that this theory has been extended to apply to intra-urban contexts and the research questions in this thesis by using density rather than place size and by using subjective rather than objective dependent variables for access and overloading.

\(^2\) Note, this does not speak to environmental and economic overloading considerations with increasing urbanisation
influence on subjective urban QOL than objective rural environments via subjective evaluations of the natural environment. Also, the objective coastal environment was associated with subjective urban QOL independently of subjective evaluations of the natural environment. Not surprisingly then, higher concentrations of residents are found near objective coastal environments than objective rural environments.

Younger non-nuclear household environments were negatively associated with subjective evaluations of the social environment. Perhaps higher proportions of rented dwellings were associated with more mobile residents and weaker social connections in these environments. This contrasts with weak positive relationships between the subjective social environment and both nuclear family household and older non-nuclear household environments found in bivariate analyses, though these were later found to be insignificant in multivariate analyses.

The relationship between the objective socioeconomic environment and subjective evaluations of the social environment was interesting because this relationship was insignificant in the bivariate analyses but significant in the multivariate analyses. This indicates a suppressor variable (Howell, 1997; Tabachnick & Fidell, 1996). A suppressor variable controls for irrelevant variance in another predictor variable such that that predictor variable then becomes a better predictor of the dependent variable. A prime candidate for the suppressor variable was the objective disadvantaged environment because it correlated most highly with the objective socioeconomic environment. However, follow-up partial correlation analyses revealed that the suppressor variable was in fact the objective younger non-nuclear household environment because the correlation between the objective socioeconomic environment and subjective evaluations of the social environment became significant only when partialling out this variable (partial $r = .05, p < .05$). Thus, the objective socioeconomic environment has a positive relationship with subjective evaluations of the social environment when controlling for objective young non-nuclear household environments, though once again this relationship was also weak.

The objective disadvantaged environment and objective ethnic environment both had weak negative bivariate relationships with the subjective social environment. However, both of these relationships were not significant in the multivariate analyses.

Overall, the relationships between objective dimensions of the social environment and the subjective social environment were either weak or not significant. So while some of the significant relationships may be interesting, it is important not to overstate their importance.

As mentioned in multivariate analyses (subsection 4.2.2.2), positive affect and negative affect were significant predictors of subjective evaluations of the urban environment and subjective urban
QOL. As well as being control variables for mood bias, they acted as a useful benchmark for comparing effects of other predictors. The direct effects of objective dimensions on subjective evaluations of the urban environment were in the same order of magnitude as mood bias. However, positive affect and negative affect only controlled a small amount of variation in subjective evaluations of the urban environment (less than 2% together for each subjective evaluation, see Table 4-2). Thus, it does not seem very important to control for positive and negative affect in subjective evaluations of the urban environment.

In contrast, positive and negative affect controlled more variation in subjective urban QOL (between 5.1% and 8%, see Table 4-3 and Table 4-4). This is consistent with the idea by Schwarz and Strack (1999) that mood bias is more important in more global judgements like subjective urban QOL and less important in more specific judgements like subjective evaluations of the urban environment. Schwarz and Strack proposed that people use their affective state as a source of heuristic information when asked to make more difficult global judgements (i.e., they consult how they ‘feel’ about a question to assist themselves in answering a more cognitively demanding question). However, in Schwarz and Strack’s (1999) judgement model, mood bias is only expected to influence global judgements relating to overall life satisfaction, as opposed to subjective urban QOL. The findings in this chapter indicate that mood bias influences subjective urban QOL considerably, though not subjective evaluations of the urban environment.

4.3.3 Limitations with Data, Methodology and Analyses

The weak relationships found between objective dimensions and subjective evaluations of the urban environment means that it is important to discuss possible limitations with the data, methodology and analysis that may have contributed to these weak relationships.

4.3.3.1 Data

Items for objective access, the objective rural environment and the objective coastal environment used straight line distances when it may have been better to use the shortest road route distances. However, these objective dimensions were considered broad constructs which could be indicated by either straight line or shortest road route distances. This view is supported by objective density highly correlating with objective access (r = -.66, p < .01), as well as with the objective rural environment (r = .72, p < .01). Thus, straight line distances seemed a good indicator of proximity for these dimensions.
The weak relationship between objective density and subjective overloading may be thought to be due to reliability or validity problems with subjective overloading since it also has low correlations with other variables generally. However, subjective overloading seems reliable as measured by a coefficient alpha of .85. Also, the underlying items have face validity as problems associated with increasing urbanisation and rapid population growth. Finally, subjective overloading has some predictive validity in terms of significantly predicting subjective urban QOL, though this relationship was not strong.

The relationship between objective density and subjective overloading may have been weakened from scale discordance (Lee & Marans, 1980). Objective density items were associated with residents’ neighbourhoods and local areas while subjective overloading was associated with subjective evaluations of various problems in the SEQ region more generally. It is possible that this relationship may have been stronger if objective density and subjective evaluations of various urban problems were both related to residents’ neighbourhoods and local areas. However, the data shows there is no significant relationship between the objective density of a resident’s neighbourhood and their subjective evaluations of problems in SEQ more generally.

Regarding subjective evaluations of the urban environment, they were all negatively skewed with the exception of subjective overloading. The majority of responses for these skewed measures were favourable (i.e. between 4 and 5 on a 5-point scale) which may have produced ceiling effects. Ceiling effects can arise from restricted upper limits in response categories which can attenuate correlations. Thus, it may have been better if item Likert scales had included more extreme end points like extremely good or extremely satisfied rather than very good or very satisfied. While possible ceiling effects may have attenuated correlations somewhat, this would not account for very weak relationships between objective dimensions and subjective evaluations of the urban environment.

Lastly, subjective urban QOL had a relatively low measure of internal consistency coefficient or coefficient alpha (α = .60). However, subjective urban QOL was reliable enough to demonstrate that the four subjective evaluations of the urban were associated with subjective urban QOL (i.e., they were all significant predictors). Further, it was best predicted by the subjective social environment (which had the next lowest coefficient alpha, α = .75), suggesting that lower alpha coefficients detracted very little from the usefulness of these variables and simply reflected the broad nature of these constructs.

4.3.3.2 Methodology and Analyses

Other limitations may be associated with methodologies and analyses. Objective dimensions may affect more than one subjective evaluation of the urban environment. Cross paths may have been
explored with path analysis, for example. However, the main aim in this thesis was to examine the strength of direct links between objective dimensions and subjective of the urban environment most conceptually related with each other.

On another issue, the analyses assumed linear relationships between objective dimensions and subjective evaluations of the urban environment. While it is possible to test for non-linear relationships, the scatterplots in Appendix D did not suggest any non-linear relationships. Accordingly, it seems more productive in subsequent chapters to investigate indirect and more sophisticated explanations relationships between objective dimensions and subjective evaluations of the urban environment. Nonetheless, it was still worthwhile to test the strength of simple direct linear relationships as it tests the most parsimonious of explanations relating objective dimensions with subjective evaluations of the urban environment.

Finally, the objective dimensions of the urban environment may have been better based on the residents’ activity patterns rather than where they lived. Experiences of urban environments are not only a function of where residents live but also of their experiences in other parts of the urban environment (e.g., where they work, study, shop, play and relax). However, limited data was available on activity spaces and where residents live is a ‘primary node’ in activity spaces.

A number of limitations with data, methodology and analyses have been discussed. While these limitations may have weakened relationships somewhat, they would not seem sufficient to explain the very weak relationships found between objective dimensions and subjective evaluations of the urban environment. If relationships between objective dimensions and subjective evaluations of the urban environment were simple direct relationships, then we could have expected these relationships to be at least moderate in strength, even with the limitations discussed. It may be that the relationships between objective dimensions and subjective evaluations are direct but that they are weak. However, before concluding that the objective dimensions of the urban environment have little impact on subjective evaluations of the urban environment and subjective urban QOL, more sophisticated explanations need to be explored which may account for the weak relationships found.

4.3.4 Conclusions

This chapter establishes that the direct relationships between objective dimensions and subjective evaluations of the urban environment are weak. These weak links did not support a simple mediated model of subjective urban QOL despite subjective evaluations of the urban environment significantly predicting subjective urban QOL.
Limitations with data, methodology and analyses, may partly explain weak direct relationships between objective dimensions and subjective evaluations of the urban environment, but they seem insufficient to fully explain them. If the relationships were indeed direct in nature, then it they would be fundamentally weak. However, it seems counter-intuitive that objective dimensions of the urban environment would have little impact on subjective evaluations of the urban environment and subjective urban QOL. So, indirect relationships also need to be explored associated with more sophisticated explanations of possible relationships between them. Such explanations are explored in following chapters.

Chapter 5 explores psychological processes associated with subjective judgement models and adaptation models, while later chapters explore differences between individuals and social groups in what is considered subjectively important in the urban environment, as well as the impact of residential relocation decision processes on relationships between objective dimensions and subjective evaluations of the urban environment. Then in the last chapter, inferences can be made about the best explanation for weak relationships between objective dimensions and subjective evaluations of the urban environment, and implications can be discussed for urban QOL theory and urban planning.
Chapter 5  Psychological Processes

5.1  Introduction

The findings in Chapter 4 showed that direct links between objective dimensions and subjective evaluations of the urban environment were surprisingly weak. This chapter is the first of three chapters examining various explanations that may assist in explaining these weak direct relationships. One such explanation is that direct relationships are weak because psychological processes complicate relationships between objective dimensions and subjective evaluations of the urban environment.

Psychological processes relating to subjective evaluations or judgements connect the objective and subjective worlds of individuals. So any examination of links between objective dimensions and subjective evaluations of the urban environment should incorporate explore these psychological processes. The main aim in this chapter is to examine these underlying psychological processes and the role they may play in explaining weak direct relationships between objective dimensions and subjective evaluations of the urban environment.

This chapter focuses on effects of individual standards of comparison in forming subjective evaluations and how these may weaken relationships between objective dimensions and subjective evaluations of the urban environment. The psychological process of subjectively evaluating an urban environment means imbuing sensory perceptions with positive or negative evaluations. Regardless of whether an objective characteristic of the urban environment has a pleasant or unpleasant effect on the senses, if someone is satisfied or rates a characteristic of the objective environment as relatively good, the subjective judgement implies the object of judgement exceeds some individual standard of comparison.

5.1.1  Individual Standards and Subjective Evaluations

In many life domains, weak relationships between objective circumstances and subjective evaluations are often explained in terms of psychological processes relating to differing individual standards of comparison (e.g., Kahneman, 1999; Michalos, 1985; Schwarz & Strack, 1999). The basic premise underlying such explanations is that subjective evaluations are not predicted by the perceived objects of judgement (targets) but are instead predicted by the difference between targets and individual standards of comparison (individual standards). This chapter examines relationships between targets and individual standards that may explain weak relationships between objective dimensions and subjective evaluations of the urban environment.
Whenever an individual makes a subjective evaluation or judgement of some objective situation, there is a strong tendency to relate the object of judgement (or target) to a relevant frame of reference (or individual standard) (Kahneman, 1999). Michalos (1985) reviews a wide range of empirically supported psychological theories that use this premise as a basis for explaining subjective evaluations, including aspirations theory, equity theory, cognitive dissonance theory, reference group theory and social comparison theory. Models adopting this explanatory framework to explain subjective evaluations are referred to as ‘subjective judgement models’ in this chapter.

Subjective judgement models involving standards of comparison have been used to explain subjective evaluations in various QOL domains (e.g., Kahneman, 1999; Meadow, Mentzer, Rahtz, & Sirgy, 1992; Michalos, 1985; Schwarz & Strack, 1999) as well in urban QOL domains (e.g., Marans & Rodgers, 1975; Michalos, 1985; Schwarz, Strack, Kommer, & Wagner, 1987). However, no studies have yet measured individual standards directly even though some have asked survey respondents to subjectively estimate differences between targets and their standards (e.g. whether targets fall below, meet or exceed standards) (e.g., Michalos, 1985, 1986; Wright, 1985). Presumably this is because it is difficult to measure individual standards directly. Other studies have used experimental and quasi-experimental designs to demonstrate the influence of standards on subjective evaluations (e.g., Abele & Gendolla, 1999; Schwarz, Strack, Kommer, & Wagner, 1987).

In the study by Schwarz et al (1987), students were given a life satisfaction survey, including a question on housing satisfaction. In this experiment, students were randomly allocated to one of two rooms: one very pleasant with posters, flowers and comfortable furniture while the other very unpleasant being small, dirty, overheated and smelly. Both rooms were pre-tested to verify the effectiveness of this ‘pleasantness’ manipulation. The study showed that those in the pleasant room rated their own housing satisfaction significantly lower than those in the unpleasant room, suggesting that the rooms influenced their standards of comparison, presumably at an unconscious level. Thus, experimental evidence suggests that individual standards of comparison would be involved when making subjective evaluations of the urban environment.

5.1.2 Variations in Individual Standards of Comparison

Schwarz and Strack (1999) emphasise individual variations in both perceptions of targets and individual standards in explaining weak relationships between objective circumstances and subjective evaluations. They argue that underlying these individual variations are differences in information readily accessible in memory, primarily because information retrieval from memory is selective. Further, the information search is truncated after enough information comes to mind to form a
subjective evaluation with ‘sufficient’ certainty (Bodenhausen & Wyer, 1987, cited in Schwarz & Strack, 1999). Thus, information that is more readily accessible in memory for one reason or another (e.g., frequency accessed, relatively important, primed, or recent information) may bias mental constructions of targets and standards of comparison. However, individual standards have more potential to vary than targets because while both may rely on biased memory, targets relate to specific targets in the urban environment while individual standards may relate to many different available comparisons. Accordingly, this chapter focus on individual variations in standards.

The variety of standards of comparison are highlighted by Multiple Discrepancy Theory (Michalos, 1985). In Michalos’s operationalisation of his theory, respondents were asked to rate their current circumstances by making a range of comparisons in a variety of life domains. For example, in the urban QOL domain, they were asked to compared the area in which they lived with: their general aspirations or what they wanted; that of most people their own age; what they thought they deserved; what they thought they needed; what they had expected 3 years ago; what they expected 5 years in the future; and the best they had had in the past. In Multiple Discrepancy Theory, respondents are theorised to think about a wide range of subjective discrepancies to form a generalised subjective discrepancy which predicts satisfaction. While, Schwarz and Strack (1999) suggest the formation of individual standards is less systematic, it is clear that many different comparisons can be drawn.

Schwarz and Strack (1999) also reviewed a range of studies showing a variety of ways that standards of comparison may influence subjective evaluations. From an intra-individual perspective, they discussed comparing ‘what is’ with ‘what was’, ‘what will be’ and ‘what might have been’ and from an inter-individual perspective, they discussed ways standards can vary according to different social comparisons. Social comparisons can be downward, upward or lateral in direction, each serving different functions. Downward comparisons with those in less favourable circumstances serve to enhance subjective evaluations of a respondent’s circumstances (a self-enhancement function) (e.g., S. E. Taylor, Wayment, & Carrillo, 1996; Wills, 1981); upward comparisons with those in more favourable circumstances produce less favourable subjective evaluations but may also serve to motivate a respondent toward their aspirations (a self-improvement function) (e.g., Morse & Gergen, 1970; Salovery & Rodin, 1984); and lateral comparisons with others who share a similar social background may be motivated by endeavours to make ‘relevant’ social comparisons for self-evaluation purposes (a self-assessment function) (e.g., Festinger, 1954; Goethals & Darley, 1977; Miller & Prentice, 1996). It is evident then that individual standards of comparison have the potential to vary greatly, both because of what is most accessible in memory and also because of different motivations associated with
subjective evaluations. Thus, Schwarz and Strack (1999) emphasise unpredictability with individual standards.

In contrast to this notion of unpredictable standards is the notion that standards are relatively predictable because they tend towards their targets over time through processes of adaptation. Kahneman (1999) describes two such processes called the ‘hedonic treadmill’ and the ‘satisfaction treadmill’ whereby initially more varied subjective evaluations (both positive and negative) become moderated over time such that most people tend to report being satisfied over time when they may have initially reported being very satisfied or very dissatisfied. With the hedonic treadmill, sensory perceptions of the target adjust over time such that good and bad attributes are less noticed over time (e.g., perceptually adjusting to traffic noise such that it is rarely noticed). With the satisfaction treadmill, standards are hypothesised to adjust over time (e.g., becoming more accepting of traffic noise). Both processes tend to reduce differences between targets and standards and are types of adaptation models.¹

5.1.3 Summary

In summary, standards of comparison are integral to forming subjective evaluations. There are two main ways in which variations in individual standards can explain weak relationships between targets and subjective evaluations. Firstly, variations in individual standards may be relatively unpredictable. This explanation is emphasised by Schwarz and Strack (1999). Secondly, standards and targets may explain weak relationships by moving closer together over time. Close targets and individual standards mean limited variation in subjective evaluations. This second type of explanation is emphasised in adaptation models.

In the rest of this chapter, subjective judgements models are first explored before developing a methodology for examining variations in individual standards. Since no direct measures of individual standards were available, ‘implied standards’ were estimated from objective dimensions and subjective evaluations of the urban environment, together with some simplifying assumptions. Then adaptation models are tested to see whether subjective evaluations of the urban environment tend to decrease in variation with increasing length of residency. Finally, the potential for variations in individual

¹ Note that standards and targets can also become more aligned by means other than psychological processes; that is, by overt actions. The main way this occurs with regard to urban QOL is by the resident relocating. However, residential relocation models are the focus of Chapter 7, while this chapter focuses on psychological processes.
standards to explain weak relationships between objective dimensions and subjective evaluations of the urban environment is discussed.

5.2 A Judgement Model of Subjective Well-Being

The judgement model of subjective well-being proposed by Schwarz and Strack (1999) aims to explain weak relationships between objective circumstances and subjective satisfaction judgements. In this model, subjective evaluations are theorised to be a function of differences between perceived objective circumstances (or targets) and an individual standards of comparison (or standards), rather than being a direct function of objective circumstances. As such, variations in individual standards can weaken direct relationships. Thus, it is important to examine the extent to which individual standards vary.

In Schwarz and Strack’s (1999) judgement model, two different psychological processes are hypothesised depending on whether a global well-being or domain specific judgement is being made (see Figure 5-1). With global well-being judgements such as overall life satisfaction, the respondent may consider mood or affect as informative in making these judgements. Questions about overall life are complex and respondents may use how they are feeling as a simplifying heuristic or source of information when asked complex questions so as to assist with making such judgements.

However, with domain specific judgements such as subjective urban QOL, mood is not hypothesised to be important because the judgement is less complex and simplifying heuristics are not seen as needed. By extrapolation, mood would not be seen as important with sub-domain judgements like subjective evaluations of various aspects of the urban environment, though the model doesn’t specifically refer to sub-domains.

In Figure 5-1 the path for domain specific judgements is the hypothesised process for subjective evaluations of the urban environment and subjective urban QOL, and this path bypasses any mood effects. However in Chapter 4, mood bias was an important predictor of subjective urban QOL, making the other path more relevant for subjective urban QOL. Nonetheless, mood bias was not an important predictor of subjective evaluations of the urban environment, and thus mood bias is not examined in this chapter because the focus is on subjective evaluations of the urban environment.
The path for domain specific judgements involves retrieving relevant information from memory to construct internal representations of targets and standards in a resident’s mind. Then a subjective evaluation is based on the perceived discrepancy between the target and standard. This subjective evaluation is then reported unless the judgement is edited for some social reason. However, social desirability bias is reasonably small in subjective well-being judgements (Diener, 1984), and it would presumably be smaller in life domains and sub-domains less associated with self-evaluation such as subjective urban QOL and subjective evaluations of the urban environment.

5.2.1 Possible Relationships between Standards, Targets and Subjective Evaluations

Three different scenarios map out limits in the ways targets and standards can be related:

- Scenario 1 involves a common standard where there is no variation in individual standards and as such no relationship with targets.
- Scenario 2 involves much variation in individual standards and no relationship with targets because the individual standards are unpredictable.
Scenario 3 involves much variation in standards by way of being highly correlated with their targets, and so they are relatively predictable in that they vary with their target.

Each scenario has different implications for subjective judgement models as an explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment. Figure 5-2 illustrates the basic distinction between a common standard and varying individual standards. If every resident had a common standard (e.g., y\(_0\) in Figure 5-2a) then the strength of relationships between objective dimensions and subjective evaluations of the urban environment would not be influenced by the standard and the relationship would be relatively direct. In this case every resident would have a similar standard and a similar level of satisfaction associated with a target on an objective dimension. Residents whose objective environment exceeded this common standard would be satisfied, while residents whose objective environment did not would be dissatisfied. Thus relationships between objective environments and satisfaction would be strong. However, if residents had very different individual standards (e.g., from y\(_1\) to y\(_5\) in Figure 5-2b), then relationships between objective dimensions and subjective evaluations of the urban environment would be weak. For any target, the subjective evaluation could not be estimated without knowing individual standards.

Figure 5-2. The theoretical effects of differing individual standards on satisfaction with objective dimensions of the urban environment

Source: the author
In Scenario 1, a common standard means there is no correlation between targets and standards, and the relationship between the difference scores (the difference between targets and individual standards) and subjective evaluations becomes a direct function of targets. This is demonstrated below mathematically where $E =$ subjective evaluations, $a =$ constant, $b =$ coefficient, $Diff =$ difference scores, $T =$ targets, and $S =$ a common standard.

\begin{align*}
E &= a + b \times Diff \\
E &= a + b \times (T - S) \quad \text{where } Diff = T - S \\
E &= a + bT - bS \\
E &= (a - bS) + b \times T \quad \text{where } a \text{ and } S \text{ are both constants.} \\
E &= \text{constant} + bT \quad \text{i.e. targets and subjective evaluations are directly related.}
\end{align*}

In Scenario 2 and Scenario 3 the individual standards vary. If individual standards vary greatly, they can vary either independently of the target (Scenario 2), which case there would be no correlation between standards and targets, or they may vary dependent on the target (Scenario 3), perhaps tracking the target closely in which case the correlation between the target and the standard would be high. Together with Scenario 1, these two scenarios map out some limits of relationships between standards, targets and subjective evaluations within the framework of subjective judgement models.

These scenarios relate to different ways in which standards may influence subjective evaluations, and to the extent that the data are more consistent with one of these scenarios, the data can provide support for one explanation over the others for weak relationships between objective dimensions and subjective evaluations of the urban environment:

- If the data were more consistent with Scenario 1 with low variation in standards, then there would be little support for subjective judgement models in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment. To the contrary, we would expect relatively strong relationships because subjective evaluations would then be a direct function of the target.
- If the data were more consistent with Scenario 2 with high variation in standards independent of the target, then there would be support for the subjective judgement model in explaining weak relationships by virtue of individual standards being highly variable and unpredictable.
- If the data were more consistent with Scenario 3 with high variation in standards which were also highly dependent on the target, then the subjective judgement model would also be
consistent with weak relationships. However, the interpretation would not be that standards vary unpredictably, but rather that they are predictably close to targets. This interpretation would lend support to adaptation models and residential relocation models.

5.2.2 Hypotheses

The main hypothesis is there will be great variation in individual standards as this offers an explanation for weak relationships between objective dimensions and subjective evaluations of the urban environment. The magnitude of variation in standards may be thought of relative to variation found in objective dimensions of the urban environment (or targets), and great variation can be considered as variation which is near or even exceeds variation found in the objective urban environment.

- Little or no support is expected for Scenario 1 since relatively low variation in standards (or a fairly common standard of comparison) would not explain weak relationships between objective dimensions and subjective evaluations of the urban environment.
- In contrast, support is expected for either Scenario 2 or Scenario 3 since relatively high variations in standards would be consistent with weak relationships between objective dimensions and subjective evaluations of the urban environment.
- However, no specific hypotheses are made as to whether relatively high variations in standards would be relatively lowly correlated with targets, supporting the idea of relatively unpredictable standards (Scenario 2); or relatively highly correlated with targets, supporting the idea that standards and targets tend to align with each other (Scenario 3).

5.2.3 Methodology

The methodology outlined below explores variations in individual standards and is exploratory in that no analysis of this type has previously been undertaken with subjective judgement models. This innovative methodology calculates ‘implied standards’, using data on objective dimensions and subjective evaluations of the urban environment together with assumptions underlying subjective judgement models to estimate variation in individual standards. This methodology is used because no data on individual standards were available. However, it is still important to explore variations in individual standards because they are integral to psychological processes connecting the objective and

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2 Standards and targets may also align during residential relocation.
subjective worlds of individuals. The methodology used is exploratory theoretical modelling using empirical data.

While the methodology can not directly test subjective judgement models (since these models are assumed as part of calculating implied standards), the methodology can be used to indicate which of the three scenarios outlined above is more plausible given available data on objective dimensions and subjective evaluations of the urban environment within the explanatory framework of subjective judgement models.

5.2.3.1 Theoretical Relationships between Standards, Targets and Difference Scores

Variations in standards, targets and difference scores are related because the latter is the difference between targets and standards.

\[
\text{Diff} = T - S
\]

In accordance with the variance sum law (Howell, 1997), the variance for difference scores is shown below where \( \sigma^2 \) = variance, \( \sigma \) = standard deviation, and \( r_{TS} \) = the correlation between targets and standards.

\[
\sigma^2_{\text{diff}} = \sigma_T^2 + \sigma_S^2 - 2r_{TS} \cdot \sigma_T \cdot \sigma_S
\]

Equation 1 shows that the relationships between variations in standards, targets and difference scores also depend on the correlation between targets and standards. Rearranging Equation 1 shows that the variance for standards is:

\[
\sigma^2_S = \sigma^2_{\text{diff}} - \sigma^2_T + 2r_{TS} \cdot \sigma_T \cdot \sigma_S.
\]

Each scenario has different implications for entities in the variance sum law. In Scenario 1, a common standard means that the standard is constant and the variance of standards is therefore zero. Given that the variance of targets is always 1 (since objective dimensions are standardised variables)

\[\sigma^2_T = \sigma^2_S = 1\]

Equation 1 simplifies to:

\[
\sigma^2_{\text{diff}} = \sigma_{\text{TS}}^2 - 2COV_{TS}
\]

where COV is the covariance. However, the former is used since the correlation \( r \) is more useful for interpretation as a scale free standardised measure.
and the standard is a constant, it means that the variance in difference scores (T-S) is the same as the variance in targets (i.e., 1) and that the correlation between targets and the standard is zero. These relationships for Scenario 1 are shown below mathematically.

\[
\sigma_{\text{diff}}^2 = \sigma_T^2 + \sigma_S^2 - 2r_{TS} \cdot \sigma_T \cdot \sigma_S
\]

\[
\sigma_{\text{diff}}^2 = 1 + 0 - 2 \times 0 \times 1 \times 0
\]

\[
\sigma_{\text{diff}}^2 = 1
\]

Or alternatively

\[
\sigma_S^2 = \sigma_{\text{diff}}^2 - \sigma_T^2 - 2r_{TS} \cdot \sigma_T \cdot \sigma_S
\]

\[
\sigma_S^2 = 1 - 1 + 2 \times 0 \times 1 \times 1
\]

\[
\sigma_S^2 = 0
\]

Scenario 2 has no common standard and the standard varies unpredictably and independently of the target. In this scenario, the correlation between the standard and the target is also zero and the variation in difference scores is relatively large (i.e., equal to the variance of targets plus the variance of standards, as shown below). If the standards varied as much as the target, the variance in standards would be 1 and the variance in difference scores would be twice that of either targets or standards:

\[
\sigma_{\text{diff}}^2 = \sigma_T^2 + \sigma_S^2 - 2r_{TS} \cdot \sigma_T \cdot \sigma_S
\]

\[
\sigma_{\text{diff}}^2 = 1 + 1 - 2 \times 0 \times 1 \times 1
\]

\[
\sigma_{\text{diff}}^2 = 2
\]

Scenario 3 also has no common standard, and standards are dependent on individual targets in that they track targets closely. This implies the variation in difference scores is small. The variation in standards would be similar to that of targets, and the correlation between the standards and targets would be high. In the hypothetical case where standards track targets so closely that they always equal their targets (e.g., the resident is always just satisfied), the variance of standards and targets would both
equal 1, the correlation between standards and targets would also equal 1, and the variance of difference scores would be zero:

\[
\sigma_{\text{diff}}^2 = \sigma_T^2 + \sigma_S^2 - 2r_{TS}\cdot \sigma_T\cdot \sigma_S \\
\sigma_{\text{diff}}^2 = 1 + 1 - 2 \times 1 \times 1 \times 1 \\
\sigma_{\text{diff}}^2 = 0
\]

In summary, the variation in targets, standards, and difference scores, and the correlation between targets and standards have different patterns under the different scenarios. And the pattern for these entities implied by the data may support one scenario over another in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment using subjective judgement models.

5.2.3.2 Implied Standards and Implied Difference Scores

As mentioned, implied standards are calculated from objective dimensions and subjective evaluations, together with some simplifying assumptions. These are then used to estimate variation in standards, variation in difference scores, and correlations between standards and targets.

Standards and difference scores can be implied within the explanatory framework of subjective judgement models using the assumption that subjective evaluations are predicted by difference scores: 
\( E = a + b \times \text{Diff} \). The constant \( a \) in this formula can be ignored for calculating variances in implied standards and difference scores, as well as for implied correlations between standards and targets, because variances and correlations are unaffected by adding a constant (Russo, 2003). So the formula can be simplified to \( E = b \times \text{Diff} \) for our purposes. This formula was used to derive implied standards and difference scores as follows:
Implied standards\(^4\)

\[ E = b \times \text{Diff} \]

\[ E = b(T - S) \]

\[ E = bT - bS \]

\[ bS = bT - E \]

\[ S = \frac{bT - E}{b} \]

\[ S = T - \frac{E}{b} \] \hspace{1cm} (3)

Implied difference scores

\[ E = b \times \text{Diff} \]

\[ \text{Diff} = \frac{E}{b} \] \hspace{1cm} (4)

The implied standards and implied difference scores also depend on assumptions for \( b \). The \( b \) coefficient reflects the assumed linear relationship between difference scores and subjective evaluations. It is the change in subjective evaluations associated with a unit change in difference scores.

An alternative way to view the \( b \) coefficient is to consider how much change in the difference score is needed to change from a very unfavourable subjective evaluation of 1 to a very favourable subjective evaluation of 5. In Figure 5-3, \( b_1 \) assumes it only takes a one unit change in difference scores to change a subjective evaluation from very unfavourable to very favourable, \( b_2 \) assumes it takes a two unit change in difference scores etc (note that the units of targets, standards and difference scores are the same). For example, with \( b_1 \) a resident would need to change from being half a standard deviation below their standard to being half a standard deviation above their standard to change their subjective evaluation from being very unfavourable to very favourable. Similarly, with \( b_6 \) it is assumed that a resident would need to change from being three standard deviations below their standard to being three standard deviations above their standard to change their subjective evaluation from being very unfavourable to very favourable. Thus, \( b_1 \) indicates that subjective evaluations are relatively sensitive to changes in difference scores while \( b_6 \) indicates that subjective evaluations are relatively insensitive.

\(^4\) Note that since \( \text{Diff} = \frac{E}{b} \), an equivalent formula for implied standards is \( S = T - \text{Diff} \)
Figure 5-3. Hypothetical relationships between subjective evaluations and difference scores under different assumptions for the $b$ coefficient

Of course the relationship may not be perfectly linear. Figure 5-4 shows a more likely ‘S-shaped’ relationship relating to $b_6$ where small changes in extreme difference scores may make little impact on subjective evaluations. An ‘S-shaped’ curve suggests that a change from an outlier of -6 to -4 (or 6 SDs below a resident’s standard to 4 SD deviations below their standard) results in little change in the subjective evaluation. However, the linear assumption relating to $b_6$ would still be a reasonable approximation for the relationship between difference scores and subjective evaluations over most of the range of difference scores, and a linear assumption seems reasonable.
5.2.3.3 Procedure

Implied standards and difference scores were calculated for each objective dimension of the urban environment, using Equation 3 and Equation 4 respectively, for each value of the $b$ coefficient from $b_1$ to $b_6$.

The $b$ coefficients for relationships between difference scores and subjective evaluations were assumed to be either positive or negative based on the same sign as the $B$ coefficients for the main effects found in Chapter 4 on the strength of relationships between objective dimensions and subjective evaluations of the urban environment. For example, objective access was negatively associated with subjective access reflecting more satisfaction with access with less distance to services and facilities. So the $b$ coefficient in this case was assumed to be negative such that a positive difference score (being further from services and facilities than your standard) would be associated negatively with subjective access. Conversely, objective density was positively associated with subjective overloading (even thought the $B$ coefficient was not significant), so the $b$ coefficient in this case is assumed to be positive.
such that positive difference scores indicating higher densities than an individual standards are positively associated with subjective overloading.\(^5\)

Using Equation 3 and Equation 4 above, sets of implied standards and difference scores were calculated for each resident, for each relationship between objective dimensions and subjective evaluations of the urban environment, and for each of the six assumed values of \(b\) (from \(b_1\) indicating subjective evaluations are relatively sensitive to changes in difference scores to \(b_6\) indicating that subjective evaluations are relatively insensitive).

After the sets of implied standards and difference scores were calculated for each resident, objective dimension, and assumed value of \(b\), the standard deviations and variances of these implied standards and difference scores were calculated, as well as the correlations between associated targets and implied standards. These calculations were then checked by entering the variances and correlations into the variance sum law \(\sigma_{\text{Diff}}^2 = \sigma_T^2 + \sigma_S^2 - 2r_{TS}\sigma_T\sigma_S\) to confirm that the law held for each value of \(b\) on each dimension.

Finally, the general pattern in the relationships between the variations in implied standards and difference scores as well as the correlation between implied standards and targets were graphed for each objective dimension of the urban environment and each assumed value of \(b\) to see whether the patterns were more supportive of one of the scenarios.

### 5.2.4 Results

The variation in each of the entities (i.e. the implied standards, difference scores and correlations for each value of \(b\)) was reported in standard deviations units rather than variances since standard units are generally more meaningful. Since the overall pattern of results was very similar for each objective dimension, only the general overall pattern is shown in Figure 5-5 which averages across the 10 objective dimensions of the urban environment shown individually in Appendix E. In Appendix E, the signs for the \(b\) coefficients were the same as the main effects for each objective dimension, as mentioned previously. However, the overall pattern of results was very similar even when assuming the opposite signs for \(b\) coefficients\(^6\). This is mainly due to the variance in difference

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\(^5\) While the \(b\) coefficients were assumed to be the same sign as the \(B\) coefficients in GLM analyses in the previous chapter, the analyses were also run with \(b\) coefficients using the opposite signs since the direct relationships found in the previous chapter were weak.

\(^6\) Using the opposite signs for \(b\) produced slightly higher estimates for standard deviations of standards and correlations between targets and standards, while the standard deviation of the difference scores remained unchanged (as discussed above). The largest differences were for the objective younger non-nuclear household environment assuming \(b_6\) where the
scores not being affected by the sign of $b$ since $b$ is squared when calculating the variance in difference scores: Given $\text{Diff} = E/b$ (Equation 4), then $\sigma^2_{\text{Diff}} = \sigma^2_E / b^2$ follows from the laws of algebra (see Russo, 2003, pp. 39-40).

**Figure 5-5.** The pattern of relationships between standard deviations of standards, targets and difference scores, as well as the correlation between standards and targets under various assumptions for the $b$ coefficient.

In Figure 5-5, the standard deviations of implied difference scores (SD Diff) were relatively low for all values of $b$. As outlined in subsection 5.2.3.1 (Scenario 2), a variance of 2 would indicate a large valuation in difference scores, equivalent to a SD Diff of 1.4. However, the standard deviations (and variances) for difference scores were approximately 1 or less.

SD Diff increased as the assumptions for $b$ changed from $b_1$ to $b_6$. These assumptions reflected an increasing insensitivity of subjective evaluations to difference scores, and so larger variations in difference scores were needed to account for the same variation in subjective evaluations. However, implied standard deviation increased from 1.43 to 1.68 and the correlation between targets and standards increased from .56 to .70. However, overall the differences were small.
SD Diff was still generally lower than the standard deviation for targets (i.e. 1 SD) and always lower than the standard deviation of standards (SD Std).

In contrast, SD Std was relatively high under all assumptions for \( b \), increasing as the assumptions for \( b \) changed from \( b_1 \) to \( b_6 \). As mentioned, as \( b \) changes from \( b_1 \) to \( b_6 \), subjective evaluations become increasingly insensitive to difference scores, and thus implied standards are assumed to be further away from the targets to account for the subjective evaluations. However, even at \( b_1 \), the variation in implied standards was quite high, showing as much variation in standards as the objective urban environment (i.e. 1 SD).

Figure 5-5 also shows the implied correlations between targets and standards (T,S) were relatively high, ranging from approximately .6 to nearly 1. As the \( b \) coefficient changed from \( b_1 \) to \( b_6 \), the correlations between targets and standards decreased (i.e., the differences between targets and standards increased in accordance with increasing insensitivity of subjective evaluations to difference scores). However, the correlations between targets and standards were relatively high under all six assumptions for \( b \).

Overall, the pattern of relationships shown in Figure 5-5 was consistent with Scenario 3, as opposed to Scenario 1 or Scenario 2. That is, the pattern was consistent with an explanation of weak relationships between objective dimensions and subjective evaluations where standards vary relatively closely around targets giving rise to high correlations between standards and targets, high variations in individual standards, and low variation in difference scores. The pattern of relationships was not consistent with Scenario 1 where a fairly common standard of comparison would imply relatively low variation in standards and low correlations between targets and standards. Nor was it consistent with Scenario 2 where relatively unpredictable standards would imply high variation in individual standards but relatively low correlations between targets and standards.

5.3 Adaptation Models

Scenario 3 is consistent with psychological adaptation and residential relocation process explanations. In this section, adaptation models are explored. As mentioned previously, adaptation models involve the notion that targets and standards come together over time via two processes: the hedonic treadmill and the satisfaction treadmill (Kahneman, 1999). With the hedonic treadmill, sensory perceptions adapt over time so that constant and familiar stimuli becomes less noticeable. The notion of sensory adaptation originally stemmed from Helson’s adaptation-level theory (Helson, 1948, 1964); however, sensory adaptation was later extended to adjusting standards and aspirations in a paper by Brickman and Campbell (1971). With the satisfaction treadmill, standards adapt over time toward
the target because standards are related to expectations and aspirations, both of which are based to a large degree on our current objective circumstances (for a review, see Irwin, 1944).

Another adaptation model is Cummins’s (2000) theory of homeostasis. In his homeostatic model, cognitive biases serve as functional adaptive devices to promote positive subjective evaluations of a respondent’s life circumstances. Failure of positive cognitive biases in undesirable objective circumstances (e.g., undeniably bad objective circumstances which can not be cognitively reframed) can lead to depression and withdrawal from life which is seen as dysfunctional. Positive cognitive biases occur when constructing targets and standards underlying subjective evaluations (Cummins & Nistico, 2002). Targets may be selectively perceived so as to provide a positive bias. Standards of comparison may also be selective so as to give positive subjective evaluations by making downward comparisons. Thus, Cummins’s homeostasis model also involves adjustments of targets and standards, weakens the relationship between targets and subjective evaluations.

There is another adaptation model that does not necessarily involve the notion of standards and targets. The Dynamic Equilibrium Model (Headey & Wearing, 1989) postulates that subjective well-being for individuals is relatively stable over time due to stabilising influences of personality on subjective evaluations. Personality is a stable predictor of subjective well-being (for a review, see Diener, 1984), and even though a sudden change in life circumstances may change subjective evaluations of life markedly, this theory postulates that, over time, subjective well-being returns to some normal equilibrium level governed by personality.

Although these adaptation models differ somewhat, common among them all is that individual subjective evaluations become less varied over time following a change in life circumstances before tending to settle again at some stable equilibrium level. An often cited example of adaptation processes is from a study by Brickman et al. (1978) where differences between subjective well-being for state lottery winners and accident victims (quadriplegic and paraplegics) were not as great as may be expected. However, in the context of subjective evaluations of the urban environment, a more relevant life event is changing residential locations.

Typical timeframes for psychological adaptation to new residential locations were not known as no studies were found in the literature of these psychological processes in the context of subjective evaluations of the urban environment. However, some adaptation may be expected, especially in the first year after moving. Studies of other major life changes like unemployment, marriage, divorce, and widowhood show adaptation of life satisfaction occurs over a number of years (for a review, see Diener, Lucas, & Scollon, 2006). Adaptation to changes in residential location may also be expected.
over a number of years, even though adaptation timeframes are likely to vary between individuals and subjective evaluations (Diener, Lucas, & Scollon, 2006).

5.3.1 Hypotheses

In the 2003 QOL Survey, respondents were asked how many years they had been living at their current address. Recent movers may be considered as those residents living for one year or less at their current address while longer term residents may be considered as living at their current address for longer periods. With adaptation models, more variation is expected among recent movers than among longer term residents for each subjective evaluation of the urban environment and subjective urban QOL. That is, the variation in these subjective evaluations is hypothesised to decrease over time.

5.3.2 Methodology

The independent variable in these analyses was length of residency while the dependent variables were the subjective evaluations of the urban environment and subjective urban QOL. First, the sample was divided into four reasonably equal sized groups based on length of residency: 1 year or less (n = 306); 2 to 4 years (n = 389); 5 to 10 years (n = 347); and over 10 years (n = 476). Then the variances for each subjective evaluation of the urban environment as well as subjective urban QOL were tested to see if they differed significantly between groups using Brown and Forsythe’s test for homogeneity of variances (M. B. Brown & Forsythe, 1974).

5.3.3 Results

5.3.3.1 Descriptive Statistics

The descriptive statistics show little support for hypotheses that variability in subjective evaluations decline with increasing length of residency expected with adaptation models. On the contrary, the standard deviations (SD) shown in Figure 5-6 suggest there is reasonably consistent

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7 Several statistical tests were available to test for homogeneity of variances. The simplest was the F test for homogeneity of variances (the ratio of the largest variance to the smallest variance). However, this test is sensitive to the assumption that variables are normally distributed (Howell, 1997) and with the exception of subjective overloading, subjective evaluations of the urban environment and subjective urban QOL were negatively skewed. Levene’s test for homogeneity of variances (Levene, 1960) is more robust to non-normal distributions. This is essentially a t-test using deviations from the mean (or deviation scores) instead of absolute scores (Howell, 1997). Levene’s test was subsequently improved by Brown and Forsythe (1974) by using deviations from the median rather than the mean. So, Brown and Forsythe’s test for homogeneity of variances was used to test for homogeneity of variance between the different groups of residents for each subjective evaluation of the urban environment and subjective urban QOL.
variation in subjective evaluations of the urban environment and subjective urban QOL for different lengths of residency.

**Figure 5-6.** Variation in subjective evaluations of the urban environment and subjective urban QOL by length of residency (boxplots of means and standard deviations)

Source: the author
Even though the standard deviations appeared reasonably consistent, they were tested for significant differences using Brown and Forsythe’s test for homogeneity of variances. As Table 5-1 shows, no significant differences were found: the \( p \) values associated with the \( F \) statistics were all over \( .05 \) for each subjective evaluation of the urban environment and subjective urban QOL. Thus, there was no evidence suggesting that adaptation models play a role in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment.

Table 5-1. Tests for significantly different variation in subjective evaluations of the urban environment and subjective urban QOL between groups of residents with different lengths of residency

<table>
<thead>
<tr>
<th>Subjective evaluations</th>
<th>( F )</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective access</td>
<td>1.12</td>
<td>.34</td>
</tr>
<tr>
<td>Subjective overloading</td>
<td>1.71</td>
<td>.16</td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td>1.31</td>
<td>.27</td>
</tr>
<tr>
<td>Subjective social environment</td>
<td>.29</td>
<td>.83</td>
</tr>
<tr>
<td>Subjective urban QOL</td>
<td>1.99</td>
<td>.12</td>
</tr>
</tbody>
</table>

Notes: \( N = 1,514 \)
Source: the author

5.4 Discussion and Conclusions

The main aim in this chapter was to explore psychological processes in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment. This was done with subjective judgement models and adaptation models.

5.4.1 Subjective Judgement Models

Three scenarios were examined with explored different ways in which subjective judgement models may explain weak relationships between objective dimensions and subjective evaluations of the urban environment. The modelling showed individual implied standards varied greatly but not unpredictably. The implied standards were correlated highly with targets. This high correlation was due to relatively small differences between standards and targets, which was consistent with Scenario 3
where individual standards vary around but not far from individual targets. Considering that subjective evaluations of the urban environment are generally favourable, this also implies that individual standards are generally met in SEQ.

The results did not test the subjective judgement model itself since this explanatory framework was assumed in the analyses. Rather, the implied standards were estimated using this explanatory framework and data on objective dimensions and subjective evaluations of the urban environment. Thus, when using subjective judgement models as a theoretical framework for explaining weak relationships between objective dimensions and subjective evaluations of the urban environment, the weak relationships can be explained by standards which vary around and relatively close to targets (as opposed to either relatively unpredictable or fairly common between residents).

Unfortunately individual standards could not be measured directly. However by implying standards within a subjective judgement model, this chapter makes an original contribution by providing justification in favour of one scenario over others; that is, in favour of Scenario 3.

5.4.2 Adaptation Models

A common psychological explanation for standards and targets being relatively close together is they come together over time via adaptation. However, no support was found for adaptation models in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment. Variation in subjective evaluations was not significantly different between residents recently moving to an area (living in their area for one year or less) and other longer term residents. Perhaps adaptation had already taken place for some residents living in their area for one year or less. If residents mostly adapt to new residential environments within the first year, this group would contain some residents who would have mostly adapted. However, there would still be some more recent residents who would not have adapted to their new residential environments. So, higher variation in this group could still be expected compared to groups with longer periods of residency if adaptation was an important factor in aligning standards with targets.

Longitudinal data would have been better than cross-sectional data for testing adaptation following residential relocation. It would have more power to detect adaptation since variations in subjective evaluations associated with individual differences could be controlled and information would not be lost by grouping residents into periods of residency. Notwithstanding this, given that no

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8 Another possibility is that the standards and targets of residents may largely become aligned as part of the process of searching for and moving to new residential locations rather than adapting after moving to new residential locations. Residential relocation processes are explored in Chapter 7.
significant differences were found in variations of subjective evaluations between groups of residents with different lengths of residency, any effects of adaptation would seem small.

5.4.3 Conclusion

This chapter shows that one plausible psychological explanation for weak relationships between objective dimensions and subjective evaluations is that subjective evaluations of the urban environment are predicted by the difference between individual standards and targets rather than directly by targets, and that these individual standards vary around and relatively close to individual targets. However, psychological adaptation does not seem to explain these close relationships between standards and targets. This suggests that other processes outside the mind may be more important in aligning targets and standards, particularly the residential relocation process.

However, before exploring residential relocation in Chapter 7, weak relationships may also be explained by individual and social group differences in the subjective importance of different attributes of the objective urban environment. This explanation is explored in Chapter 6.
Chapter 6  Individual and Social Group Differences

6.1  Introduction

While weak relationships between objective dimensions and subjective evaluations of the urban environment may be plausibly explained in terms of variations in individual standards closely around targets, an alternative explanation is that individual differences in what is subjectively important in the urban environment may moderate relationships between objective dimensions and subjective evaluations of the urban environment. This alternative explanation is explored in this chapter.

Individual differences in what residents consider important in their urban environment relate more to differences in individual values than differences in psychological processes. The more valued something is to an individual; the more subjectively important it is to an individual. Individual differences in what is considered important are investigated in this chapter because such variation can potentially assist in explaining weak direct relationships between objective dimensions and subjective evaluations of the urban environment.

The relationship between an objective dimension and an associated subjective evaluation of the urban environment may be significant for residents who consider that that objective dimension is subjectively important to them but not significant for those residents who do not consider it important. In this way, individual differences in subjective importance may moderate and so weaken the relationships between objective dimensions and subjective evaluations of the urban environment.

Individual differences in subjective importance can relate to both physical and social dimensions of the urban environment. However, subjective importance relating to social dimensions is complicated by the relationship between the social characteristics of residents and their social environment to the extent that it is subjectively important to live in a neighbourhood with other similar people. The subjective importance of living near similar people relates to homophily, which literally means love of the same. Thus relationships between the social characteristics of residents and their objective social environment are also examined in this chapter as a potential moderator of relationships between objective dimensions and subjective evaluations of the social environment.

6.1.1  Homophily

Homophily, which literally means love of the same, can be thought of psychologically as an attraction to similar people, or structurally as a tendency for people to have denser network ties with similar others. Structural homophily refers to an empirical observation in networks of relationships
where people generally have more and denser ties with others who have similar social characteristics, and is a commonly observed characteristic of relationship networks. Structural homophily is expected to occur by chance to some extent because people from majority social groups are more likely to have relationships with other members of the majority by chance alone (McPherson, Smith-Lovin, & Cook, 2001).

Psychological homophily relates to an attraction or liking for similar others. Such attraction or liking may operate via various psychological mechanisms by directly reinforcing own values, reflecting back values, indicating others that are ‘good’, indicating others that are compatible, and indicating others that may like them (Huston & Levinger, 1978).

Lazarsfeld and Merton (1954) propose two types of psychological homophily: social homophily (which they term ‘status homophily’) and value homophily. Social homophily is an attraction to others with the same social characteristics while value homophily is an attraction to others with similar attitudes and values. This thesis examines social homophily as it relates more directly to objective dimensions of the social environment. Figure 6-1 shows the different types of homophily, even though these not mutually exclusive.

**Figure 6-1. Types of homophily**

![Homophily Diagram](image)

Source: the author

In this chapter, structural homophily is examined to see whether simply having similar (or dissimilar) social characteristics to the objective social environment in which a resident lives impacts on their subjective evaluations of the social environment. However, the subjective importance of similar others may vary considerably between individuals. This chapter also examines how individual differences in the subjective importance of similar others may moderate any effects of structural
homophily. In other words, this chapter also examines social homophily effects on subjective evaluations of the social environment over and above any effects for structural homophily.

### 6.1.2 Weighting by Subjective Importance

A common method for testing moderating effects of individual differences when predicting a dependent variable involves weighting or multiplying the main independent variables by an individual difference variable. For example, multiplying an objective dimension of the urban environment (the main independent variable) by individual differences in the subjective importance of that dimension (the moderating variable) when predicting subjective evaluations of the urban environment (see point A in Figure 6-2).

**Figure 6-2. A moderated model of urban QOL**

While weighting by individual differences in subjective importance is common in the QOL literature, these studies have been limited to weighting subjective evaluations in predicting more global subjective evaluations (e.g., point B in Figure 6-2). These studies have mainly found that weighting subjective evaluations by subjective importance is no better than using unweighted subjective evaluations in predicting more global subjective evaluations (e.g., Andrews & Withey, 1976; Campbell, Converse, Rodgers, & Marans, 1976; Cummins, McCabe, Romeo, & Gullone, 1994; Mastekaasa, 1984; e.g., Russell, Hubley, Palepu, & Zumbo, 2006).

Despite this, there have been continuing calls to investigate weighting by subjective importance (see Hsieh, 2003, 2004; Russell, Hubley, Palepu, & Zumbo, 2006), attesting to the persisting intuition that some things contribute more to subjective QOL than others depending on individual differences in subjective importance. However, point B in Figure 6-2 may not be the best place to examine weighting by subjective importance. Trauer and Mackinnon (2001) suggest that subjective evaluations already
incorporate a notion of subjective importance since very favourable or unfavourable subjective evaluations of something imply it is subjectively important. This may explain why weighting subjective evaluations by subjective importance does not improve the predictability of more global subjective evaluations (e.g., point B). However, it also raises the possibility that it may be more appropriate to weight objective characteristics by subjective importance in predicting subjective evaluations (e.g., point A) since objective measures do not inherently incorporate a notion of subjective importance. This chapter tests for moderating effects of subjective importance at point A between objective dimensions and subjective evaluations of the urban environment.

6.1.3 Weighting by Objective Importance

Objective urban QOL studies often apply objective or a common set of weights across all residents in calculating urban QOL. In these studies, places are often ranked in terms of QOL indexes calculated by weighted averages of objective characteristics for each place (e.g., popular place rated almanacs started over twenty five years ago with Boyer & Savageau, 1981). Such rankings are often controversial because the common set of weights can be somewhat arbitrary (Landis & Sawicki, 1988). More objective weightings can arguably be created using hedonic price equations (e.g., Blomquist, Berger, & Hoehn, 1988; Stover & Leven, 1992); however, a common weighting scheme is still assumed across all residents. One study in the literature has used measures of subjective importance in their design (Rogerson, Findlay, Morris, & Coombes, 1989). However, these subjective importance measures were also averaged across the sample to form a common set of weights across residents. The need to use a common set of weights across residents seems to stem from a desire to rank places on QOL according to an objective criteria; however, it does not allow for individual differences in subjective importance.

No studies were found in the literature where objective characteristics of the urban environment were weighted by individual differences in subjective importance. So the analyses in this chapter represent a novel approach by weighting objective dimensions of the urban environment by subjective importance in examining links between objective dimensions and subjective evaluations of the urban environment.

6.1.4 Hypotheses

6.1.4.1 Individual Differences in Subjective Importance

A stronger relationship may be expected between an objective dimension and subjective evaluation of the urban environment for residents who considered that objective dimension subjectively
important. Conversely, a weak or insignificant relationship may be expected for residents who did not consider that objective dimension subjectively important. More specifically, stronger relationships are expected:

- between objective access and subjective access for residents considering ‘convenience to places such as shopping and schools’ subjectively important in choosing where they lived (H1)
- between objective density and subjective overloading for those considering ‘openness/spaciousness of area’ subjectively important in choosing where they lived (H2)
- between the objective rural environment and the subjective natural environment, as well as between the objective coastal environment and the subjective natural environment for residents considering being ‘close to natural areas (bush, creeks, beaches etc)’ subjectively important in choosing where they lived (H3 and H4 respectively)
- between dimensions of the objective social environment and the subjective social environment for residents considering living in areas with ‘people similar to them’ subjectively important in choosing where they lived (H5, H6, H7, H8, H9 and H10 respectively)

These hypotheses are illustrated diagrammatically in Appendix F where positive and negative relationships are represented by positive and negative slopes respectively, and insignificant relationships are represented by a horizontal line. Two examples are explained in more detail below using Figure 6-3 and Figure 6-4 (both reproduced from Appendix F).

Hypotheses H1 to H4 represent two-way interactions between objective dimensions of the urban environment and individual differences in the subjective importance of various attributes of the urban environment in choosing where to live. Two-way interactions mean that the main relationship of interest between the dependent variable and main independent variable is contingent on a moderating variable. For example, the relationship between subjective access (the dependent variable) and objective access (the main independent variable) is contingent on the subjective importance of convenience to places (the moderating variable) such that the relationship between subjective access and objective access is only expected to be significant for residents considering convenience to places subjectively important (see Figure 6-3). Since objective access measures distance from services and facilities, the relationship with subjective access is expected to be negative for these residents.

1 The phrases within quotation marks in these four dot points reflect the wording used in subjective importance measures described in subsection 6.2.1.1).
Figure 6-3. The hypothesised two-way interaction between objective access and the subjective importance of convenience in predicting subjective access

![Figure 6-3 Diagram]

H1 Importance of convenience to places

Source: the author; reproduced from Appendix F.

Figure 6-4. The hypothesised three-way interaction between the objective nuclear family environment, the subjective importance of living in an area with similar others, and whether a resident is living in a nuclear family household

![Figure 6-4 Diagram]

Source: the author, reproduced from Appendix F.
H5 to H10 represent three-way interactions. That is, the main relationship of interest is expected to be contingent on two moderating variables. For example in Figure 6-4, the relationship between the objective nuclear family household environment and the subjective social environment is expected to be contingent on whether the resident was living in a nuclear family household (the first moderating variable) and on whether they considered living in an area with similar people subjectively important (the second moderating variable). For residents considering living in an area with similar people subjectively important, a positive relationship was expected if they were living in a nuclear family household and a negative relationship was expected if they were not (see H6a in Figure 6-4). For those residents not considering living in an area with similar people subjectively important, no significant relationship was expected (H6b in Figure 6-4).

6.1.4.2 Structural Homophily

The three-way interactions hypothesised for objective dimensions of the social environment (H5a to H10b, exemplified in Figure 6-4) relate to social homophily associated with individual differences in the subjective importance of living in areas with similar others. Structural homophily, on the other hand, relates to the likelihood that a resident will live in a neighbourhood with similar social characteristics independently of how subjectively important living near similar others is to them. The expected two-way interactions for structural homophily are shown in hypotheses H11 to H16 in Appendix F.

Structural homophily may affect subjective evaluations of the social environment independently of social homophily. Alternatively, any significant effects of structural homophily may depend on the subjective importance of similar others such that structural homophily only has an effect for residents considering living near similar people subjectively important. So, this thesis examines potential effects of both structural and social homophily on subjective evaluations of the social environment.

6.2 Methodology

6.2.1 Measures

The measures for the objective dimensions and subjective evaluations of the urban environment were defined in Chapter 3. Defined below are measures used in analyses testing moderating effects of subjective importance and social characteristics of residents on subjective evaluations of the urban environment.
6.2.1.1 Subjective Importance Measures

Subjective importance data from the 2003 QOL Survey were gained by asking respondents how important were various attributes of their urban environment in their decision to move to their neighbourhood. Residents responded to a range of items on a 5-point Likert scale where 1 was ‘not at all important’, 2 was ‘not very important’, 3 was ‘somewhat important’, 4 was ‘important’, and 5 was ‘very important’.

For subjective access, the importance item selected was the importance of ‘convenience to places such as shopping and schools’, for subjective overloading it was ‘openness/spaciousness of area’, for the subjective natural environment it was being ‘close to natural areas (bush, creeks, beaches etc)’ and for the subjective social environment it was the importance of in a neighbourhood with ‘people similar to you’. Although 10 other importance items were also asked in the survey, (see Appendix G), these four were selected as being most closely related to the objective dimensions of the urban environment examined in this thesis.

The number and percentage of missing values for these four items were relatively low: convenience of place (n = 14; 1.8%), openness/spaciousness of area (n = 16; 2.1%), close to natural areas (n = 15; 1.9%), and people similar to you (n = 17; 2.2%). However, these four items were only asked of approximately half the sample (N = 775, randomly selected) as part of a non-core set of questions designed to reduce the length of the survey and respondent burden, as explained in subsection 3.1.1.

6.2.1.2 Social Characteristics of Residents

The sampled residents had social characteristics related to the objective social dimensions of the urban environment in SEQ. This allowed the homophily hypotheses to be tested where more positive subjective evaluations of the social environment are expected by residents living in areas with others similar to themselves (see McPherson, Smith-Lovin, & Cook, 2001). The social characteristics of residents measured were resident-household types, resident socioeconomic status, disadvantaged residents and ethnic residents.

The resident-household types were based on both the type of household in which a resident lived and the age of the resident. Residents living in a ‘couple with children’ household or a ‘one parent family’ household were classified as being a resident in a nuclear family household, regardless of their age. The remaining residents were classified as either a younger resident in a non-nuclear household or an older resident in a non-nuclear household depending on whether the resident was aged 45 or less (45 was the median age in the sample). These resident-household types were intended to
relate to the first three objective dimensions of the social environment: younger non-nuclear, nuclear family and older non-nuclear household environments.

*Resident socioeconomic status* was measured using the ANU4 scale (Jones & McMillan, 2001) which is a socioeconomic index for 117 different Australian occupations based on the 2 digit level of the Australian Standard Classification of Occupations (ASCO; Australian Bureau of Statistics, 1997). Socioeconomic status is inferred from occupation using a technique which optimises the effect of occupation as an intervening variable between education and income (see Ganzeboom, De Graaf, & Treiman, 1992). This method highly correlates with another method used for the ANU3_2 scale (J. McMillan & Jones, 2000) which was based on a survey of social prestige associated with different occupations ($r = .92$ between ANU3_2 and ANU4 for residents in this sample). While both measures are closely related and both produce an index of socioeconomic status by occupation code, the ANU4 was used as a more up-to-date index based on a later edition of ASCO.

In the 2003 QOL Survey, residents were asked for their occupation if they were currently employed or asked for their last occupation if not currently employed (e.g., unemployed, retired, studying or undertaking home duties). These occupations were then coded to ASCO before being allocated a socioeconomic index score ranging from 0 to 100 from the ANU4 scale (e.g., agricultural labourers = 0, motor mechanics = 33, generalist managers = 50, architects = 84, and medical practitioner = 100).

*Disadvantaged residents* were conceptualised as residents having difficulties meeting their basic needs (i.e., food, clothing and shelter) and thus having difficulties participating fully in society. Disadvantaged residents may be unemployed, single parents, disabled or elderly but not necessarily. In Australia, those having difficulty meeting basic needs are generally eligible to receive a government pension or benefit. So in this thesis, disadvantaged residents were defined as those residents whose main source of income was a government pension or benefit, which was asked in the 2003 QOL Survey.

*Ethnic residents* were conceptualised as residents from a non-western cultural backgrounds while non-ethnic residents were from a western cultural backgrounds. Non-ethnic residents were defined in this thesis as those born in Australia and New Zealand; Northern and Western Europe (including the United Kingdom and Ireland); the USA and Canada. On the other hand, ethnic residents were defined as those born in Eastern, South-Eastern and Southern Europe; Central and South American; the Caribbean; Melanesia, Micronesia, and Polynesia; North and Sub-Saharan Africa; the
Middle East; and Asia (South-East, North-East, Southern and Central Asia)\textsuperscript{2}. This was intended to relate to the objective ethnic environment in SEQ which was defined by the percentage of residents belonging to non-Christian religions, the percentage born in South East Asia, the percentage born in Southern or Eastern Europe and the percentage born in South and Central America.

While the 2003 QOL Survey had no information on a resident’s religion or their parent’s country of birth, the survey had information on the resident’s country of birth. So residents were classified as being ethnic or non-ethnic based on their own country of birth. This means that first generation Australians were classified as non-ethnic residents while their parents were classified as ethnic residents.

As with the subjective importance measures, the number and percentage of missing values for the social characteristics of residents were relatively low: resident-household type (n = 10; .7%), resident socioeconomic status (n = 51; 3.4%), disadvantaged residents (n = 9; .6%), and ethnic residents (n = 2; .1%). While the items relating to social characteristics were asked of the full sample (N = 1,518), the effective sample size used in analyses in this chapter involving subjective importance, social characteristics, and objective dimensions and subjective evaluations of the urban environment was 724, taking into account missing values on these measures and taking into account that approximately half the residents were asked items relating to subjective importance.

6.3 Results

6.3.1 Descriptive Statistics

Figure 6-5 shows the subjective importance of various attributes of the urban environment for residents in SEQ in choosing the neighbourhood in which they lived. Most residents considered convenience to places, openness/spacious, and closeness to natural areas as either important or very important in choosing where they lived (67.5%, 65.0%, and 58.1% respectively). However, fewer residents considered living in neighbourhoods with similar people as important or very important (39.7%). However, it was similar to the percentage of residents considering neighbourhoods with similar people as not very important or not at all important (37.7%).

\textsuperscript{2} Countries in the broad country groupings are as defined by the Standard Australian Classification of Countries (Australian Bureau of Statistics, 1998)
The percentage of residents with different social characteristics are shown in Table 6-1. Approximately 45 percent of residents were living in a nuclear family household, with around 35 percent being older residents in non-nuclear households and less than 20 percent being younger residents in non-nuclear households. Less than one third of residents were higher socioeconomic status residents, using a cut-off index value of 50 out of a 100. Only 7 percent of residents were classified as disadvantaged residents, and less than 6 percent were classified as ethnic residents, reflecting a relatively affluent western society in SEQ.

### Table 6-1. Social characteristics of residents in the sample

<table>
<thead>
<tr>
<th>Social characteristics</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger residents in a non-nuclear households</td>
<td>19.2</td>
</tr>
<tr>
<td>Residents in a nuclear family households</td>
<td>45.4</td>
</tr>
<tr>
<td>Older residents in a non-nuclear households</td>
<td>35.3</td>
</tr>
<tr>
<td>Higher socioeconomic status residents</td>
<td>31.8</td>
</tr>
<tr>
<td>Disadvantaged residents</td>
<td>25.0</td>
</tr>
<tr>
<td>Ethnic residents</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Notes: N = 724
Source: the author
6.3.2 Bivariate Correlations

Before analysing interactions with Generalised Linear Modelling (GLM), simpler bivariate relationships were examined (see Table 6-2). Individual differences in subjective importance were generally correlated moderately with objective dimensions of the urban environment. In particular, the importance of convenience to places was moderately correlated with objective access (-.28); importance of openness/spaciousness with objective density (-.21); importance of closeness to natural areas with objective rural and coastal environments (-.20 and -.11 respectively). These relationships presumably reflect residential relocation decision processes which are examined in the next chapter. In contrast, the importance of similar people was not significantly correlated with any objective dimensions of the social urban environment, which may be because these relationships depend on social characteristics of residents.

Individual differences in subjective importance were also correlated moderately with most of the subjective evaluations of the urban environment. In particular, the importance of convenience to places was correlated with subjective access ($r = .32$); importance of closeness to natural areas with the subjective natural environment ($r = .15$); and importance of similar people with the subjective social environment ($r = .23$), though the importance of openness/spaciousness was not significantly correlated with subjective overloading. These significant relationships may also reflect the residential relocation decision process to the extent that residents presumably choose neighbourhoods that they favourably evaluate on attributes of the urban environment important to them. On the other hand, the correlations may also underlie interactions with subjective importance variables in predicting subjective evaluations of the urban environment, as tested in the GLM analysis below (see subsection 6.3.3).

The social characteristics of residents were often significantly correlated with objective dimensions of the social environment, as may be expected with structural homophily. Younger residents in non-nuclear households were correlated with objective younger non-nuclear household environments ($r = .22$); residents in nuclear family households with objective nuclear family environments ($r = .23$); older residents in non-nuclear households with objective older non-nuclear household environments ($r = .19$); socioeconomic status of residents with objective socioeconomic environments ($r = .30$); disadvantaged residents with objective disadvantaged environments ($r = .16$); and ethnic residents with objective ethnic environments ($r = .11$). Thus residents were more likely to live in neighbourhoods with similar people but these correlations were not high.
Table 6-2. Correlations between objective dimensions and subjective evaluations of the urban environment with individual differences in subjective importance and social characteristics of residents

<table>
<thead>
<tr>
<th>Objective dimensions of the urban environment</th>
<th>Subjective evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective access</td>
<td>Subjective access</td>
</tr>
<tr>
<td>Objective density</td>
<td>Subjective overloading</td>
</tr>
<tr>
<td>Objective rural environment</td>
<td>Subjective natural environment</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td>Subjective social environment</td>
</tr>
<tr>
<td>Objective younger non-nuclear household envir.</td>
<td>Objective socioeconomic environment</td>
</tr>
<tr>
<td>Objective nuclear family household environment</td>
<td>Objective disadvantaged environment</td>
</tr>
<tr>
<td>Objective older non-nuclear household envir.</td>
<td>Objective ethnic environment</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td>Subjective access</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td>Subjective overloading</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td>Subjective natural environment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual differences in subjective importance</th>
<th>Convenient to places</th>
<th>Openness/spaciousness</th>
<th>Closeness to natural areas</th>
<th>Similar people</th>
<th>Younger resident in a non-nuclear household</th>
<th>Resident in a nuclear family household</th>
<th>Older resident in a non-nuclear household</th>
<th>Socioeconomic status</th>
<th>Disadvantaged resident</th>
<th>Ethnic resident</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.28**</td>
<td>.25**</td>
<td>.29**</td>
<td>-.03</td>
<td>-.12**</td>
<td>.11**</td>
<td>-.01</td>
<td>-.09**</td>
<td>.05</td>
<td>-.03</td>
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<tr>
<td></td>
<td>.24**</td>
<td>-.21**</td>
<td>-.24**</td>
<td>.03</td>
<td>.15**</td>
<td>-.09**</td>
<td>-.03</td>
<td>-.09**</td>
<td>-.09**</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>.21**</td>
<td>-.18**</td>
<td>-.20**</td>
<td>.05</td>
<td>.15**</td>
<td>-.11**</td>
<td>-.11**</td>
<td>-.09**</td>
<td>-.09**</td>
<td>.09*</td>
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<tr>
<td></td>
<td>.01</td>
<td>.02</td>
<td>-.11**</td>
<td>-.03</td>
<td>.22**</td>
<td>-.13**</td>
<td>.05</td>
<td>-.07**</td>
<td>-.07**</td>
<td>-.05</td>
</tr>
<tr>
<td></td>
<td>.14**</td>
<td>.25**</td>
<td>.24**</td>
<td>-.05</td>
<td>.08**</td>
<td>-.13**</td>
<td>.05</td>
<td>-.02</td>
<td>-.02</td>
<td>-.05</td>
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<tr>
<td></td>
<td>-.17**</td>
<td>.16**</td>
<td>.09**</td>
<td>.04</td>
<td>.13**</td>
<td>-.14**</td>
<td>-.05</td>
<td>-.04</td>
<td>-.04</td>
<td>-.05</td>
</tr>
<tr>
<td></td>
<td>.14**</td>
<td>-.14**</td>
<td>-.05</td>
<td>.11**</td>
<td>-.07**</td>
<td>-.12**</td>
<td>.05</td>
<td>-.10**</td>
<td>-.10**</td>
<td>-.05*</td>
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<td></td>
<td>.32**</td>
<td>.09*</td>
<td>.06</td>
<td>.05</td>
<td>.15**</td>
<td>.00</td>
<td>.00</td>
<td>.05*</td>
<td>.05*</td>
<td>.06*</td>
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<tr>
<td></td>
<td>.06</td>
<td>.02</td>
<td>.00</td>
<td>.00</td>
<td>.09*</td>
<td>.00</td>
<td>.00</td>
<td>.05*</td>
<td>.05*</td>
<td>.06*</td>
</tr>
<tr>
<td></td>
<td>.12**</td>
<td>.09*</td>
<td>.06*</td>
<td>.01</td>
<td>.12**</td>
<td>.00</td>
<td>.00</td>
<td>.05*</td>
<td>.05*</td>
<td>.06*</td>
</tr>
<tr>
<td></td>
<td>.14**</td>
<td>.18**</td>
<td>.27**</td>
<td>.04</td>
<td>.04</td>
<td>.04</td>
<td>.04</td>
<td>.04*</td>
<td>.04*</td>
<td>.04*</td>
</tr>
</tbody>
</table>

Notes: N = 724; envir. = environment; * p < .05; ** p < .01
Source: the author
Table 6-3 shows correlations between the subjective importance of various attributes of the urban environment and social characteristics of residents. Although the correlations were all low, some were significant. Younger residents in non-nuclear households was negatively correlated with the importance of openness/spaciousness \((r = -.14)\) and closeness to natural areas \((r = -.07)\), which means they considered these less important on average. Older residents in non-nuclear households were positively correlated with the importance of openness/spaciousness of an area \((r = .08)\), meaning this was more important to these residents on average. The socioeconomic status of residents was negatively correlated with the importance of convenience to places \((r = -.08)\) being less concerned with convenience on average. And disadvantaged residents were positively correlated with importance of similar people \((r = .08)\) suggesting more concern with living in neighbourhoods with similar others on average. However, these correlations were all low.

### Table 6-3. Correlations between the subjective importance of various attributes of the urban environment and social characteristics of residents

<table>
<thead>
<tr>
<th>Social characteristics of residents</th>
<th>Subjective importance</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Convenient to places</td>
<td>Openness/spaciousness</td>
<td>Closeness to natural areas</td>
<td>Similar people</td>
</tr>
<tr>
<td>Younger resident in a non-nuclear household</td>
<td>.01</td>
<td>-.14**</td>
<td>-.07*</td>
<td>-.05</td>
</tr>
<tr>
<td>Resident in a nuclear family household</td>
<td>.05</td>
<td>.04</td>
<td>.02</td>
<td>-.01</td>
</tr>
<tr>
<td>Older resident in a non-nuclear household</td>
<td>-.06</td>
<td>.08*</td>
<td>.05</td>
<td>.05</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>-.08*</td>
<td>.03</td>
<td>.04</td>
<td>-.03</td>
</tr>
<tr>
<td>Disadvantaged resident</td>
<td>.01</td>
<td>-.03</td>
<td>-.02</td>
<td>.08*</td>
</tr>
<tr>
<td>Ethnic resident</td>
<td>.07</td>
<td>.05</td>
<td>.02</td>
<td>.01</td>
</tr>
</tbody>
</table>

Notes: \(N = 724\); * \(p < .05\); ** \(p < .01\)

Source: the author
6.3.3 Generalised Linear Modelling

6.3.3.1 Analytic Strategy

To test for possible moderating effects of subjective importance and social characteristics of residents on relationships between objective dimensions and subjective evaluations of the urban environment, two-way and three-way interactions between objective dimensions, subjective importance and social characteristics of residents were tested. Generalised linear modelling (GLM) accommodates interactions involving both continuous and categorical variables. Interactions between continuous variables are handled in an equivalent way to cross-product terms in regression analysis while interactions between continuous and categorical variables are handled in an equivalent way to separate slopes models where different regression coefficients are estimated for each level of a categorical variable. In the GLM analyses, the subjective importance measures were treated as categorical measures so that interactions could be tested for each level of subjective importance.

The hypotheses relating to the objective physical environment (H1 to H4) involved two steps:

Step 1. An objective dimension of the urban environment was entered to control for the most parsimonious explanation; that is, the direct effects of objective dimensions on subjective evaluations of the urban environment.

Step 2. A two-way interaction between the objective dimension and the associated subjective importance measure was entered to test for any additional variation that may be explained by individual differences in subjective importance.

Testing hypotheses relating to the objective social environment (H5 to H16) involved three steps:

Step 1. As before, an objective dimension of the social environment was entered to control for any direct effects on the subjective social environment.

Step 2. A two-way interaction between the objective social dimension and the associated social characteristic of the resident was entered to test for effects of structural homophily on subjective evaluations of the social environment (H11 to H16).

Step 3. A three-way interaction was entered to test whether the two-way interaction for structural homophily depended on the subjective importance of living in an area with similar others (H5 to H10).
Main effects for subjective importance and social characteristics of residents were not entered for a couple of reasons. Firstly, the hypotheses related to weighting by subjective importance rather than directly predicting by subjective importance. And secondly, not entering these main effects allowed the interactions involving subjective importance and social characteristics of residents the opportunity to account for as much variation as possible in subjective evaluations of the urban environment as part of testing their possible moderating role in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment.

6.3.3.2 GLM Results

The two-way interactions associated with hypotheses H1 to H4 and H11 to H16 are first discussed, followed by the three-way interactions associated with hypotheses H5 to H10. The tests of the two-way interactions between objective dimensions of the physical environment and the subjective importance of various attributes of the urban environment in predicting subjective evaluations of the urban environment (H1 to H4) are shown in Table 6-4. This table shows no significant two-way interactions which suggests that relationships between objective dimensions and subjective evaluations of the physical urban environment are not moderated by individual differences in the subjective importance of various attributes of the physical urban environment.

Tests for the two-way interactions for hypotheses H11 to H16 related to whether subjective evaluations of the social environment were more favourable for residents with similar social characteristics to their objective social environments. Although little variation in subjective evaluations of the social environment was explained by any of the two-way interactions, some were significant (see Table 6-5, Step 2 for each objective social dimension). There was a significant two-way interaction between the objective younger non-nuclear household environment and younger residents in non-nuclear households ($p = <.05$). Follow up tests showed a negative relationship between objective younger non-nuclear household environment and subjective evaluations of the social environment which was stronger for younger residents in non-nuclear households ($b = -.15, p < .01$) than for other residents ($b = -.10, p < .01$). This was contrary to that hypothesised; the relationship was expected to be positive for younger residents in non-nuclear households (H11).
Table 6-4. Interactions between objective dimensions of the physical environment and the subjective importance of various attributes of the physical environment

<table>
<thead>
<tr>
<th>Subjective evaluation of the physical environment (DV)</th>
<th>F</th>
<th>p</th>
<th>Partial η^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Objective dimension of the physical environment (Step 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Two-way interaction with subjective importance (Step 2)</td>
<td>F</td>
<td>p</td>
<td>Partial η^2</td>
</tr>
<tr>
<td>Subjective access</td>
<td>46.02</td>
<td>&lt;.01</td>
<td>2.9%</td>
</tr>
<tr>
<td>1. Objective access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Interaction with importance of convenience to places</td>
<td>.36</td>
<td>.84</td>
<td>.2%</td>
</tr>
<tr>
<td>Subjective overloading</td>
<td>1.59</td>
<td>.21</td>
<td>.2%</td>
</tr>
<tr>
<td>1. Objective density</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Interaction with importance of openness/spaciousness</td>
<td>.81</td>
<td>.52</td>
<td>.4%</td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td>.79</td>
<td>.37</td>
<td>.1%</td>
</tr>
<tr>
<td>1. Objective rural environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Interaction with importance of closeness to natural areas</td>
<td>1.97</td>
<td>.20</td>
<td>.2%</td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td>3.55</td>
<td>.06</td>
<td>.5%</td>
</tr>
<tr>
<td>1. Objective coastal environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Interaction with importance closeness to natural areas</td>
<td>1.02</td>
<td>.39</td>
<td>.5%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

There was also a significant two-way interaction between objective older non-nuclear household environment and older residents in non-nuclear households (p < .01). Follow up tests showed that for older residents in non-nuclear households there was no significant relationship between the objective older non-nuclear household environment and subjective evaluations of the social environment (b = .04, p > .05), but a significant negative relationship for other residents (b = -.12, p < .01). This gave partial support for H13 whereby other residents in objective older non-nuclear household environments were expected to evaluate the subjective social environment less favourably on average.

Finally, there was a significant two-way interaction between the objective disadvantaged environment and disadvantaged residents in predicting subjective evaluations of the urban environment. Follow up tests showed a negative relationship between the objective disadvantaged environment and subjective evaluations of the social environment for residents who were not disadvantaged (b = -.09, p < .01) and a positive though not significant relationship for disadvantaged
residents \((b = .05, \ p > .05)\). This pattern was supportive of H15, though the positive relationship was not significant.

Table 6-5. Interactions between objective dimensions of the social environment, social characteristics of residents and the subjective importance of similar people

<table>
<thead>
<tr>
<th>Subjective social environment</th>
<th>(F)</th>
<th>(p)</th>
<th>Partial (\eta^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective evaluation of the social environment (DV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Objective dimension of the social environment (Step 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Two-way interaction with resident social characteristic (Step 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Three-way interaction with individual importance (Step 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Objective younger non-nuclear household environment</td>
<td>17.62</td>
<td>&lt;.01</td>
<td>2.3%</td>
</tr>
<tr>
<td>2. Interaction with younger resident in non-nuclear holds</td>
<td>4.81</td>
<td>.03</td>
<td>.6%</td>
</tr>
<tr>
<td>3. Interaction with importance of similar people</td>
<td>.87</td>
<td>.55</td>
<td>.9%</td>
</tr>
<tr>
<td>1. Objective nuclear family household environment</td>
<td>8.89</td>
<td>.96</td>
<td>1.2%</td>
</tr>
<tr>
<td>2. Interaction with resident in nuclear family households</td>
<td>.44</td>
<td>.59</td>
<td>.1%</td>
</tr>
<tr>
<td>3. Interaction with importance of similar people</td>
<td>1.84</td>
<td>.07</td>
<td>1.9%</td>
</tr>
<tr>
<td>1. Objective older non-nuclear household environment</td>
<td>6.99</td>
<td>&lt;.01</td>
<td>.9%</td>
</tr>
<tr>
<td>2. Interaction with older resident in non-nuclear households</td>
<td>9.43</td>
<td>&lt;.01</td>
<td>1.2%</td>
</tr>
<tr>
<td>3. Interaction with importance of similar people</td>
<td>1.44</td>
<td>.18</td>
<td>1.5%</td>
</tr>
<tr>
<td>1. Objective socioeconomic environment</td>
<td>.07</td>
<td>.79</td>
<td>.0%</td>
</tr>
<tr>
<td>2. Interaction with resident socioeconomic status</td>
<td>1.74</td>
<td>.19</td>
<td>.2%</td>
</tr>
<tr>
<td>3. Interaction with importance of similar people</td>
<td>1.92</td>
<td>.11</td>
<td>1.0%</td>
</tr>
<tr>
<td>1. Objective disadvantaged environment</td>
<td>2.78</td>
<td>.10</td>
<td>.4%</td>
</tr>
<tr>
<td>2. Interaction with disadvantaged resident</td>
<td>5.94</td>
<td>.02</td>
<td>.8%</td>
</tr>
<tr>
<td>3. Interaction with importance of similar people</td>
<td>1.31</td>
<td>.24</td>
<td>1.4%</td>
</tr>
<tr>
<td>1. Objective ethnic environment</td>
<td>9.10</td>
<td>&lt;.01</td>
<td>1.2%</td>
</tr>
<tr>
<td>2. Interaction with ethnic resident</td>
<td>1.47</td>
<td>.23</td>
<td>.2%</td>
</tr>
<tr>
<td>3. Interaction with importance of similar people</td>
<td>.57</td>
<td>.80</td>
<td>.6%</td>
</tr>
</tbody>
</table>

Notes: \(N = 724\); weighted by age, sex and geographic zone

Source: the author

Even though there were some significant two-way interactions at the second step, they explained very small percentages of variation in subjective evaluations of the social environment, as
reflected in the small partial eta squared ($\eta^2$) statistics, the highest being 1.2 percent at the second step for objective older non-nuclear household environments. Thus structural homophily seems to play a very small part in explaining variation in subjective evaluations of the social environment.

The three-way interactions for hypotheses H5 to H10 related to whether the effects of structural homophily depend on individual differences in the subjective importance of living in neighbourhoods with similar people. As Table 6-5 shows, none of these three-way interactions at Step 3 were significant. So although living in neighbourhoods with similar people was considered important or very important by nearly 40 percent of residents, individual differences in psychological homophily did not explain weak relationships between objective dimensions and subjective evaluations of the social environment.

6.4 Discussion

This main finding in this chapter is that weak relationships between objective dimensions and subjective evaluations of the urban environment were not adequately explained by moderating effects of individual differences in the subjective importance of various attributes of the urban environment. These moderating effects were either not significant or explained little variation in subjective evaluations of the urban environment.

6.4.1 Individual Differences in Subjective Importance

However, individual differences in the subjective importance of various attributes of the urban environment were often significantly correlated with subjective evaluations of the urban environment. These correlations were not found to be underlying moderating effects of subjective importance on relationships between objective dimensions and subjective evaluations of the urban environment.

It may be argued that the relationships between subjective importance measures and subjective evaluations of the urban environment may be due to avoiding cognitive dissonance (Festinger, 1957). More specifically, it may be argued that cognitive dissonance can arise if unfavourable subjective evaluations are associated with attributes of the urban environment that a resident considers subjectively important. Such cognitive dissonance may be avoided by realigning attitudes so that subjective evaluations are consistent with attributes of the urban environment considered subjectively important. However, this argument should also apply to realigning subjective evaluations with objective dimensions of the urban environment to be more consistent, which is not the case. So, this post factum psychological explanation can be discounted.
The more straightforward explanation for the correlations between the subjective importance of various attributes of the urban environment with both objective dimensions and subjective evaluations of the urban environment relates to the residential relocation process. In this case, correlations with both would arise because residents select residential locations based on favourable evaluations of those attributes of the urban environment subjectively important to them. This explanation is explored further in Chapter 7 which examines residential relocation decisions.

6.4.2 Social Characteristics of Residents

The results showed that social characteristics of residents were often significantly correlated with objective dimensions of the social environment, ranging from a low of \( r = .11 \) for disadvantaged residents with objective disadvantaged environments to a high of \( r = .30 \) for resident socioeconomic status with objective socioeconomic environments. These correlations reflected low to moderate levels of structural homophily. However, structural homophily did not have little impact on subjective evaluations of the social environment; nor did taking into account individual differences in the subjective importance of living near similar people (or social homophily).

Notwithstanding this, the subjective importance of similar people was significantly correlated with subjective evaluations of the social environment (\( r = .23 \)). Given the subjective importance of similar others does not relate to social homophily based on social characteristics, the importance of similar others may relate more to value homophily based on similar values, attitudes and even lifestyles. In other words, perhaps value homophily is more important than social homophily in predicting subjective evaluations of the social environment. This is an area of possible future research.

6.4.3 Conclusions

The weak relationships between objective dimensions and subjective evaluations of the urban environment were not adequately accounted for by weighting objective dimensions by individual differences in the subjective importance of various attributes of the urban environment. Consequently, the moderated effects explanation relating to individual and social group differences was not a viable alternative to the subjective judgement model explanation discussed in Chapter 5 where weak relationships were explained by variation in individual standards being highly correlated with and relatively close to targets (i.e., Scenario 3).

Scenario 3 suggested a process which aligns individual standards and targets but no support was found for psychological adaptation causing such alignment. However, alignment may occur instead during the residential relocation process. Further, the correlations found in the analyses undertaken this
chapter also suggest that the residential relocation process may play an important role in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment. This explanation is explored in Chapter 7.
Chapter 7  Residential Relocation Processes

7.1  Introduction

In Chapter 6, the moderating effects of the subjective importance of various attributes of the urban environment were not able to explain weak relationships between objective dimensions and subjective evaluations of the urban environment. However in Chapter 5, it was found plausible that variations in individual standards of comparison may explain these weak relationships provided they vary around and reasonably close to the judgement targets. Despite this, no evidence was found that psychological adaptation caused this aligning of standards and targets after residential relocation. However, individual standards of comparison and targets may become more aligned during the residential relocation process. This chapter examines whether adjustment of individual standards during the residential relocation process is a plausible explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment.

As explained in the literature review, this thesis adopts a behavioural approach with a focus on intra-urban residential relocation. A behaviourist approach has been adopted because it models the underlying cognitive and decision processes as well as the overt spatial behaviour associated with the residential relocation process (Stimson & McCrea, 2004), which together link objective dimensions and subjective evaluations of the urban environment.

An early behavioural model of residential relocation by Brown and Moore (1970) has been adopted as an explanatory framework. Although it can be extended by incorporating costs of moving, social norms, institutional constraints, and residential lifestyles (e.g., L. A. Brown & Moore, 1970; Desbarats, 1983; Fredland, 1974; Ge & Hokao, 2006; Speare, Goldstein, & Frey, 1975), this basic model by Brown and Moore (1970) provides a detailed account of cognitive decision making and overt behaviours involved in the residential relocation process compared to some later models (e.g., Amerigo & Aragones, 1997; Desbarats, 1983), and it is still applied as a basic behavioural model for the residential relocation process (Golledge & Stimson, 1997; Pacione, 1990).

7.2  Explaining Weak Relationships Using Brown and Moore’s Residential Relocation Model

Brown and Moore’s (1970) residential relocation model may also be used as a framework for potentially explaining weak relationships between objective dimensions and subjective evaluations of the urban environment via aligning of residents’ individual standards of comparison (conceptualised by the authors as needs and aspirations) with targets in their objective urban environments.
As mentioned, little evidence was found in Chapter 5 that individual standards and targets align over time via psychological adaptation. This would relate to Phase I in Brown and Moore’s model (see Figure 7-1, reproduced from the literature review in Chapter 2) where residents deciding not to move may adjust their needs and aspirations in response to dissatisfaction with their residential environment.

They may also adjust their environment in Phase I rather than moving. However, this would be limited mainly to adjusting their objective housing characteristics (e.g., housing extensions to accommodate changing space requirements) as opposed to adjusting objective dimensions of the urban environment associated with their residential location, which is more feasible through residential relocation.

**Figure 7-1. A behavioural model of the residential relocation process**

Source: adapted from L. A. Brown and Moore (1970) and Golledge and Stimson (1997); reproduced from Chapter 2
In Phase II of Brown and Moore’s model, potential aligning of a resident’s individual standards and objective judgement targets may be explained in two ways:

1) Initially, a resident formulates their searching and evaluation criteria. This involves identifying their needs and aspirations on attributes of the urban environment subjectively important to them. A resident may then find a suitable vacancy and subsequently relocate to an urban environment which closely aligns with their individual standards (or their needs and aspirations).

2) If they are unable to find any suitable vacancies, a resident reviews their needs and aspirations, thus also bringing their individual standards into closer alignment with vacancies available to them, given the constraints they face. Note, one of these ‘vacancies’ may be not to move and to adjust their needs and aspirations.

These two aligning processes have implications for relationships between objective dimensions and subjective evaluations of the urban environment, as well as for their relationships with the subjective importance of various attributes of the urban environment. These two processes of aligning individual standards and targets such that needs and aspirations are generally met implies that most residents would be satisfied with where they live, weakening relationships between objective dimensions and subjective evaluations of the urban environment.

However, under this model there still should be significant relationships between the subjective importance of various attributes of the urban environment and associated objective dimensions of the urban environment because although individual standards vary individually and may be revised when facing constraints, residents should still seek relatively favourable outcomes on objective dimensions associated with attributes of the urban environment subjectively important to them, within their own constraints. Conversely, residents would not actively pursue outcomes on attributes of the urban environment not subjectively important to them.

Also, there should still be significant relationships between the subjective importance of various attributes of the urban environment and associated subjective evaluations of the urban environment even if no vacancy could be found to meet initial needs and aspirations, since the needs and aspirations can adjust until a suitable vacancy is found for residents. Thus, residents should have favourable subjective evaluations associated with attributes of the urban environment subjectively important to them. Attributes not subjectively important for residents would not be involved in the decision process, and we may expect fairly neutral subjective evaluations of associated objective dimensions of the urban environment.
environment. Indeed, subjective evaluations were found to be mostly favourable or neutral in the descriptive statistics in Chapter 3.

7.3 Mediated and Unmediated Models of the Residential Relocation Process

Given that the residential relocation process implies weak relationships between objective dimensions and subjective evaluations of the urban environment but significant relationships between them and the subjective importance of associated attributes of the urban environment, the plausibility of the residential relocation model explanation can be tested.

In a more naïve model of residential relocation, residents may select residential locations based on what is subjectively important to them without considering the role of varied and adjusting needs and aspirations. This naïve model would predict significant relationships between the subjective importance of various attributes of the urban environment and associated objective dimensions of the urban environment, as well as direct relationships between objective dimensions and subjective evaluations of the urban environment, as reflected in the mediated model shown in Figure 7-2.

Figure 7-2. Mediated and unmediated models for objective dimensions of the urban environment

Mediated model

![Mediated model diagram](image)

Unmediated model

![Unmediated model diagram](image)

Source: the author

However, the residential relocation model of Brown and Moore implies an unmediated model with direct relationships between the subjective importance of various attributes of the urban environment and associated objective dimensions of the urban environment, as well as direct relationships between objective dimensions and subjective evaluations of the urban environment.
environment and associated subjective evaluations that are not mediated by objective dimensions of the urban environment (see Figure 7-2). Subjective importance should predict subjective evaluations of the urban environment relatively independently of outcomes achieved on objective dimensions since needs and aspirations can adjust. This chapter tests these mediated and unmediated models as a way of examining the plausibility of the residential relocation process in explaining weak relationships between objective dimensions and subjective evaluations of the urban environment.

If needs and aspirations commonly adjust during the residential search process, three propositions follow:

1. The subjective importance of various attributes of the urban environment should predict associated subjective evaluations of the urban environment because needs and aspirations can adjust such that most residents become satisfied on attributes of the urban environment subjectively important to them, which occurs independently of achieved outcomes on the associated objective dimensions of the urban environment.

2. As a consequence, the relationships between objective dimensions and subjective evaluation of the urban environment may be weak. Moreover, the objective dimension should not mediate the relationship between the subjective importance of an attribute in choosing where to live and the associated subjective evaluation of the urban environment.

3. However, the subjective importance of various attributes of the urban environment should still predict associated objective dimensions of the urban environment because relatively good outcomes are sort on objective dimensions considered subjectively important, though the relationship between them may not be strong because of constraints and other competing criteria.

To summarise these three propositions, the importance of various attributes of the urban environment should predict associated objective dimensions and subjective evaluations of the urban environment, without being mediated by objective dimensions. This equates to testing whether objective dimensions mediate the relationships between the subjective importance of various attributes and subjective evaluations of the urban environment.

The mediated and unmediated models of residential location are relatively simple models compared to Brown and Moore’s (1970) detailed model of the residential location process, which
reflects the limitations of using secondary data not designed to test this more detailed model. Nonetheless, the three propositions outlined above follow from the more detailed model and can be used to examine the residential relocation process as a potential explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment.

7.4 Analytical Strategy

Slightly different approaches are used for analyses relating to the physical and social environments when testing the mediated and unmediated models. In analyses relating to the physical environment, the subjective importance variables are used as predictors. However, in analyses relating to the social environment, interaction terms between the subjective importance of similar others and social characteristics of residents are used as predictors to reflect the importance of social homophily.

Table 7-1 shows the expected relationships between subjective importance variables and associated objective dimensions and subjective evaluations of the urban environment. The measures for subjective importance are described in Chapter 6 while the measures for objective dimensions and subjective evaluations are described in Chapter 3. The objective dimensions for access, the rural environment and the coastal environment were measured using distances which means for example that the importance of convenience to places is expected to be negatively related to objective access.

When predicting objective dimensions of the social environment, the subjective importance of similar people (1 = not at all important; 5 = very important) is multiplied by the resident social characteristic associated with an objective dimension (0 = no; 1 = yes), giving an interaction term for the importance of social homophily relating to that dimension. A positive relationship represents a stronger relationship between a residents social characteristics and the associated objective dimension for residents considering living near similar others subjectively important.

When predicting the subjective social environment, the subjective importance of similar people is multiplied by the social characteristics of residents and associated objective dimensions of the social environment. In this case, a positive relationship represents more positive subjective evaluations of the social environment for residents who have social characteristics similar to their objective social environment and who consider living near similar others subjectively important.

The analytical strategy in this chapter is reasonably complicated, mostly because of using interaction terms for structural and social homophily when testing mediated and unmediated models. So, this analytical strategy section has subsections for the physical and social environments, with the latter having subsections for structural homophily and social homophily.
Table 7-1. Subjective importance variables and associated objective dimensions and subject evaluations of the urban environment

<table>
<thead>
<tr>
<th>Subjective importance variable</th>
<th>Associated objective dimensions and subjective evaluations</th>
<th>Expected relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of convenience to places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective access</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>Subjective access</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Importance of openness/spaciousness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective density</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>Subjective overloading</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>Importance of being close to the natural areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective rural environment</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>Objective coastal environment</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>Subjective natural environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Importance of similar people interacting with social characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective younger non-nuclear household environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Objective nuclear family household environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Objective older non-nuclear household environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Objective socioeconomic environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Objective disadvantaged environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Objective ethnic environment</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Subjective social environment</td>
<td></td>
<td>Positive</td>
</tr>
</tbody>
</table>

Source: the author

7.4.1 The Physical Environment

For objective dimensions of the physical environment, the three steps for testing mediation recommended by Baron and Kenny (1986) were used to test whether objective dimensions mediated relationships between the subjective importance of various attributes of the urban environment and associated subjective evaluations. These analytical steps were:
Step 1. Regressing objective dimensions of the urban environment on associated subjective importance variables

Step 2. Regressing subjective evaluations of the urban environment on associated subjective importance variables

Step 3. Regressing subjective evaluations of the urban environment on associated subjective importance variables and objective dimensions

To support a mediating model, the following conditions must hold (Baron & Kenny, 1986): subjective importance must significantly predict the associated objective dimension of the urban environment (Step 1); the subjective importance variable must also significantly predict the associated subjective evaluation of the urban environment (Step 2); and the objective dimension must significantly predict the associated subjective evaluation of the urban environment while controlling for the subjective importance variable (Step 3). If these conditions hold, then there is evidence that the objective dimension mediates relationships between subjective importance and subjective evaluations of the urban environment, at least to some extent. And if the subjective importance variable is not significant in Step 3, then there is evidence that the objective dimension fully mediates this relationship.

If objective dimensions fully mediate relationships between subjective importance variables and subjective evaluations, then there is no evidence that needs and aspirations adjust during the residential relocation process. However, if the subjective importance variables still predict subjective evaluations of the urban environment independently of objective dimensions, as in the unmediated model, then this is consistent with needs and aspirations adjusting during the residential relocation process.

### 7.4.2 The Social Environment

In testing the mediated and unmediated models for objective dimensions of the social environment, the subjective importance of living near similar people was related to the social characteristics of a resident to gain a measure of social homophily.

As mentioned in Chapter 6, social homophily refers to an attraction to others with similar social characteristics. This can be distinguished from value homophily which refers to an attraction to others with similar attitudes and values (Lazarsfeld & Merton, 1954). Even though both involve a psychological attraction to similar others (psychological homophily) and even though social and value homophily are not mutually exclusive, the focus is on social homophily in this thesis as it most relates to the objective dimensions of the social environment being examined. However, any effects of social
homophily need to be over and above any effects of structural homophily where resident with similar social characteristics are likely to live near each other by chance alone\(^1\) (McPherson, Smith-Lovin, & Cook, 2001). Different types of homophily are shown in Figure 7-3, reproduced from Chapter 6.

**Figure 7-3. Types of homophily**

![Types of homophily diagram](image)

Source: the author, reproduced from Chapter 6

### 7.4.2.1 Effects of Social Homophily

The effects for social homophily were captured using interaction terms which related the subjective importance of living near similar people with social characteristics of residents. However, the interaction terms for social homophily need to be slightly different when predicting objective dimensions of the urban environment compared to predicting subjective evaluations of the social environment. When predicting subjective evaluations of the social environment, the interaction terms for social homophily also needed to include the objective urban environment of a resident together with their social characteristic and the subjective importance of living near similar others. However, it was necessary not to include the objective urban environment of the resident in the interaction term when predicted objective dimensions of the urban environment.

When predicting objective dimensions of the social environment, social homophily was represented by a two-way interaction between the importance of living near similar people and the social characteristics of residents relating to those objective dimensions. For example, a stronger relationship may exist between older residents living in non-nuclear households and the objective older

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\(^1\) Residents from majority social groups are likely to live near other members of the majority, to some extent, simply by chance.
non-nuclear environment for those who considered considering living near similar others subjectively important.

When predicting subjective evaluations of the social environment, social homophily was represented by a three-way interaction between an objective dimension of the urban environment, the associated social characteristics of the resident, and the subjective importance of living near similar others. For example, more favourable subjective evaluations may not only depend on whether a resident lives in an objective social environment similar to their own social characteristics, but also on whether the resident considered living near similar people subjectively important.

As mentioned, it is important that any effects of social homophily be over and above any effects of structural homophily which can occur simply because majority social groups have a higher probability of living in neighbourhoods with similar people simply by chance. With regard to testing the mediating and unmediated models shown in Figure 7-2, the subjective importance variable is interpreted as social homophily after controlling for structural homophily. Also as mentioned, support for an unmediated model would be consistent with a residential relocation process explanation for weak relationships between objective dimensions and subjective evaluations of the urban environment.

7.4.2.2 Effects of Structural Homophily

The effects of structural homophily were also captured using different terms when predicting objective dimensions of the urban environment compared to predicting subjective evaluations of the social environment. Given that structural homophily is the probability of living in neighbourhoods with similar people simply by chance (i.e., excluding any attraction to similar others), the terms for structural homophily can be operationalised the same way as social homophily except excluding the subjective importance of living near similar people.

When predicting subjective evaluations of the social environment, structural homophily can be operationalised by a two-way interaction between the objective dimension of the urban environment and the associated social characteristic of the resident (without regard to the subjective importance of living near similar others). For example, in predicting the subjective evaluations of the social environment, favourable subjective evaluations may simply depend on whether a resident’s social characteristics are similar to their objective social environment, without regard to how subjectively important this was to them.

However, when predicting objective dimensions of the social environment, only the social characteristic of the resident was needed to represent structural homophily. For example, the social characteristic of being an older person living in a non-nuclear household may predict living in an
objective older non-nuclear household environment, without regard to how subjectively important living near similar people was to the resident.

7.4.2.3 Analytical Steps for the Social Environment

When testing for mediating effects, there were differences between analyses for the social environment compared to the physical environment since the effects of structural homophily needed to be controlled when testing for effects of social homophily. In addition, the main effects were controlled for those variables involved in the interaction terms for structural and social homophily to ensure that any significant effects found for structural and social homophily were not simply due to any underlying main effects.

However, using these controls meant that testing for the mediating effects of the objective social environment could not have been done using the same three steps as used for the objective physical environment. In Step 3 for the physical environment, the objective dimension is added to the analysis. However in Step 2 for the social environment, the objective dimension is already added to control for main effects of variables involved in the interaction terms. Thus there was no need for Step 3, and analyses for mediation by the objective dimensions of the social environment were conducted using only two steps.

Despite only two steps being used to test the mediated model in the objective social environment, a number of things could still be determined. In Step 1, if social homophily did not significantly predict an objective dimension of the social environment, then social homophily could not be mediated by that objective dimension of the social environment. However if social homophily did significantly predict the objective social dimension in Step 1, then various outcomes were possible depending on the results in Step 2 (see Figure 7-4).

If in Step 2, neither the objective dimension of the social environment nor structural homophily significantly predict subjective evaluations of the social environment, then social homophily could not be mediated by the objective social environment. However, if either the objective dimension of the social environment or structural homophily significantly predicted subjective evaluations of the social environment then a couple of other outcomes were possible. If social homophily was also significant in predicting subjective evaluations of the social environment, then social homophily would be mediated to some extent by the objective social environment. However, if social homophily were not significant, then social homophily may be fully mediated or not at all mediated by the objective social environment. In this last case, mediation can not be determined with only two steps since the interaction term for social homophily is entered together with the objective dimension in Step 2; and
so, further tests would be needed to determine whether social homophily was fully or not at all mediated.

**Figure 7-4. Flowchart of steps for testing mediation of social homophily**

Since these two steps involve controlling for main effects and structural homophily, they require some elaboration. In Step 1, social homophily was represented by a two-way interaction between the social characteristics of the resident and the importance of similar people in predicting objective dimensions of the social environment. Prior to this, the main effects of the two variables
involved in the interaction were controlled (Step 1a). Then the two-way interaction term for social homophily was added (Step 1b).

In Step 1a, the main effects for the social characteristics of residents were expected to be significant since structural homophily is intrinsic to objective dimensions of the social environment. However, the main effects for the subjective importance of similar people were not expected to be significant since this variable gains meaning by relating it to the social characteristics of residents when predicting objective dimensions of the social environment (i.e. by making an interaction term for social homophily). After controlling for any main effects of these two variables, the two-way interaction for social homophily was added in Step 1b.

In Step 2, the subjective social environment was predicted by social homophily after controlling for the main effects of the variables involved in the interactions for social homophily and structural homophily. In Step 2a, the main effects were controlled: the objective dimension of the social environment, the social characteristic of the resident and the subjective importance of similar people. Then in Step 2b, structural homophily was controlled by adding a two-way interaction term between the objective dimension of the social environment and the social characteristics of the resident. Then in Step 2c, an effect of social homophily was tested by adding a three-way interaction term between all three variables.

The two main steps may be summarised as follows:

Step 1. Regressing the objective dimensions of the social environment on social homophily after controlling for main effects and structural homophily.

Step 2. Regressing subjective evaluations of the social environment on social homophily after controlling for main effects and structural homophily.²

² The analyses for social homophily in Step 2 are the same as the analysis for social homophily in Chapter 6 on individual and social group differences. However, these analyses are undertaken again to compare them with the findings from Step 1 to determine the extent to which social homophily may be mediated by the objective social environment.
7.5 Results

7.5.1 The Physical Environment

7.5.1.1 Objective Access

As mentioned, when testing the mediated and unmediated models relating to objective dimensions of the physical environment, three steps were used. Table 7-2 shows statistics for each step in the analyses for testing the mediated model for objective access. In Steps 1 and 2, the importance of convenience to places significantly predicted objective access and subjective access explaining 6.9 percent and 11.5 percent in objective access and subjective access, respectively. In Step 3 when objective access was added to the analysis, it was a significant predictor of subjective access, though it only explained 1.1 percent of subjective access, much less than the subjective importance of convenience to places (9.4%). This suggested a largely direct relationship between the subjective importance of convenience to places and subjective access with little mediation by objective access. There was more support for the unmediated model than the mediated model relating to this objective dimension.

Table 7-2. Testing mediating effects of objective access

<table>
<thead>
<tr>
<th>Step</th>
<th>Importance of convenience to places</th>
<th>B</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1. Objective access (DV)</td>
<td></td>
<td>-.22</td>
<td>&lt;.01</td>
<td>6.9%</td>
</tr>
<tr>
<td>Step 2. Subjective access (DV)</td>
<td></td>
<td>.18</td>
<td>&lt;.01</td>
<td>11.5%</td>
</tr>
<tr>
<td>Step 3. Subjective access (DV)</td>
<td></td>
<td>.17</td>
<td>&lt;.01</td>
<td>9.4%</td>
</tr>
<tr>
<td></td>
<td>Objective access</td>
<td>-.07</td>
<td>&lt;.01</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

7.5.1.2 Objective Density

Table 7-3 shows the statistics for each step in the analyses for testing objective density as a mediating variable. In Step 1, the subjective importance of the openness/spaciousness of an area significantly predicted objective density, explaining 4.2 percent of variation. However, the importance
of openness/spaciousness did not significantly predict subjective overloading in Step 2. That is, there was no relationship between them to be mediated by objective density. In Step 3 neither objective density nor the importance of openness/spacious significantly predicted subjective overloading. This suggested that the link between objective density and subjective overloading was very weak at best, consistent with previous findings, and did not support a mediated or unmediated model for this dimension.

Table 7-3. Testing mediating effects of objective density

<table>
<thead>
<tr>
<th>Step</th>
<th>Importance of openness/spaciousness</th>
<th>B</th>
<th>p</th>
<th>partial ( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1. Objective density (DV)</td>
<td>Importance of openness/spaciousness</td>
<td>-.17</td>
<td>&lt;.01</td>
<td>4.2%</td>
</tr>
<tr>
<td>Step 2. Subjective overloading (DV)</td>
<td>Importance of openness/spaciousness</td>
<td>&lt;.01</td>
<td>.83</td>
<td>&lt;.1%</td>
</tr>
<tr>
<td>Step 3. Subjective overloading (DV)</td>
<td>Importance of openness/spaciousness</td>
<td>&lt;.01</td>
<td>.96</td>
<td>&lt;.1%</td>
</tr>
<tr>
<td></td>
<td>Objective density</td>
<td>-.03</td>
<td>.21</td>
<td>.2%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

7.5.1.3 Objective Rural Environment

Table 7-4 shows statistics for each step in testing whether the objective rural environment mediated the relationship between the subjective importance of being close to natural areas and subjective evaluations of the natural environment. In Steps 1 and 2, the importance of being close to natural areas significantly predicted both the objective rural environment and the subjective natural environment. However, the objective rural environment did not significantly predict the subjective natural environment in Step 3. This provided support for a direct relationship between the importance of being close to natural areas and subjective evaluations of the natural environment that was not mediated by the objective rural environment.
Table 7-4. Testing mediating effects of the objective rural environment

<table>
<thead>
<tr>
<th>Step</th>
<th>Objective rural environment (DV)</th>
<th>Importance of being close to natural areas</th>
<th>B</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>-.15</td>
<td>&lt;.01</td>
<td>.01</td>
<td>3.7%</td>
</tr>
<tr>
<td>2</td>
<td>Subjective natural environment (DV)</td>
<td>.10</td>
<td>&lt;.01</td>
<td>.01</td>
<td>2.5%</td>
</tr>
<tr>
<td>3</td>
<td>Subjective natural environment (DV)</td>
<td>.11</td>
<td>&lt;.01</td>
<td>.01</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

Objective rural environment -.06 .07 .4%

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

7.5.1.4 Objective Coastal Environment

Table 7-5 shows statistics for the objective coastal environment as a mediating variable. This showed a similar pattern of results as for the objective rural environment. In Steps 1 and 2, the subjective importance of being close the natural areas significantly predicted the objective coastal environment and the subjective natural environment. However in Step 3, the objective coastal environment did not significantly predict the subjective natural environment. This suggested a direct relationship between the importance of being close to natural areas and the subjective natural environment that was not mediated by the objective coastal environment. That is, there was support for the mediated model.

Table 7-5. Testing mediating effects of the objective coastal environment

<table>
<thead>
<tr>
<th>Step</th>
<th>Objective coastal environment (DV)</th>
<th>Importance of being close to natural areas</th>
<th>B</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>-.08</td>
<td>&lt;.01</td>
<td>.01</td>
<td>1.3%</td>
</tr>
<tr>
<td>2</td>
<td>Subjective natural environment (DV)</td>
<td>.10</td>
<td>&lt;.01</td>
<td>.01</td>
<td>2.5%</td>
</tr>
<tr>
<td>3</td>
<td>Subjective natural environment (DV)</td>
<td>.10</td>
<td>&lt;.01</td>
<td>.01</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Objective coastal environment -.05 .16 .3%

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author
7.5.1.5 Summary of Results for the Physical Environment

For three of the four objective dimensions of the physical environment – objective access, the objective rural environment and the objective coastal environment – support was found for the unmediated model. In other words, support was found for direct relationships between subjective importance and associated subjective evaluations of the urban environment which were not mediated by their associated objective dimensions of the urban environment. However, no support was found for either the mediated or unmediated model with regard to objective density.

For objective access, the relationship between the subjective importance of convenience to places and subjective access was mostly direct, though there was support for some mediation by objective access since it still explained a small but significant variation in subjective access when controlling for the importance of convenience to places. Nonetheless, the relationship between the importance of convenience to places and subjective access was mostly unmediated.

For the objective rural and objective coastal environments, there was no evidence that they mediated relationships between the subjective importance of being close to natural areas and subjective evaluations of the natural environment. This is despite the importance of being close to natural areas significantly predicting both the objective rural and objective coastal environments. The importance of being close to natural areas also significantly predicted subjective evaluations of the natural environment when controlling for the objective rural and objective coastal environments respectively, which gave some support for the unmediated model, though these direct relationships were not strong.

For objective density, no support was found for either the mediated or unmediated model. While the subjective importance of the openness/spacious of an area did significantly predict objective density, it did not significantly predict subjective overloading; nor did objective density predict subjective overloading. Thus, there was no support for a direct relationship between the importance of openness/spaciousness and subjective overloading; nor was there support that this relationship was mediated by objective density. The relationship between objective density and subjective overloading seemed inherently weak.

7.5.2 The Social Environment

When testing the mediated and unmediated models relating to the objective social environment, two main steps were used, though the analyses in each step were hierarchical to control for structural homophily and the main effects when testing for the effects of social homophily. Step 1 related to predicting the effects of social homophily on objective dimensions of the social environment and Step 2 related to predicting its effects on subjective evaluations of the urban environment.
7.5.2.1 *Objective Younger Non-Nuclear Household Environment*

Table 7-6 shows the statistics for each step in the analyses relating to testing whether objective younger non-nuclear household environments were a mediator of social homophily in predicting subjective evaluations of the social environment. When controlling for main effects in Step 1a, the social characteristic of living in a younger non-nuclear household significantly predicted variation in the objective younger non-nuclear household environment (7.6%). This represents an effect of structural homophily. As may be expected, a main effect for the subjective importance of similar people by itself was not significant when predicting this objective dimension. In Step 1b when adding the two-way interaction for social homophily (the social characteristics of the resident by the importance of similar people), it did not significantly predict the objective younger non-nuclear household environment.

Table 7-6. Testing mediating effects of the objective younger non-nuclear household environment

<table>
<thead>
<tr>
<th>Step 1. Objective social dimension (DV)</th>
<th>B</th>
<th>p</th>
<th>partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social characteristic of resident (structural homophily)</td>
<td>.64</td>
<td>&lt;.01</td>
<td>7.6%</td>
</tr>
<tr>
<td>Importance of similar people</td>
<td></td>
<td>&lt;.01</td>
<td>&lt;.1%</td>
</tr>
<tr>
<td>Step 1b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-way interaction for social homophily</td>
<td>.02</td>
<td>.74</td>
<td>&lt;.1%</td>
</tr>
<tr>
<td>Step 2. Subjective social environment (DV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective social dimension</td>
<td>-.11</td>
<td>&lt;.01</td>
<td>1.7%</td>
</tr>
<tr>
<td>Social characteristic of resident</td>
<td>-.12</td>
<td>.07</td>
<td>.4%</td>
</tr>
<tr>
<td>Importance of similar people</td>
<td>.14</td>
<td>&lt;.01</td>
<td>5.8%</td>
</tr>
<tr>
<td>Step 2b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-way interaction for structural homophily</td>
<td>-.11</td>
<td>.07</td>
<td>.4%</td>
</tr>
<tr>
<td>Step 2c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three-way interaction for social homophily</td>
<td>-.03</td>
<td>.45</td>
<td>.1%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone

Source: the author
When controlling for the main effects in Step 2a, the most important variable was the subjective importance of similar people, explaining 5.8 percent of variation in subjective evaluations of the social environment. The objective younger non-nuclear household environment also significantly predicted subjective evaluations of the social environment, though the social characteristic of the resident was not significant. When controlling for structural homophily in Step 2b by adding a two-way interaction term between the objective dimension and the social characteristic of living in a younger non-nuclear household, it was also found not significant. Similarly in Step 2c, social homophily did not significantly predict subjective evaluations of the social environment when adding the three-way interaction term for social homophily (the objective dimension with the social characteristic of the resident with the importance of similar people). Thus, there was no support for either the mediated or unmediated model since social homophily was neither associated with the objective younger non-nuclear household environment nor subjective evaluations of the social environment.

7.5.2.2 Objective Nuclear Family Household Environment

Table 7-7 shows the statistics for the objective nuclear family household environment. When controlling for the main effects in Step 1a, the social characteristic of living in a nuclear family household significantly predicted the objective nuclear family household environment (explaining 6.8 percent), though the importance of similar people as a main effect was again not significant. When the interaction term for social homophily was added, it was also not significant.

In Step 2a when controlling for the main effects of the interaction variables, the objective dimension and the importance of similar people again significantly predicted the subjective social environment while the social characteristic of living in a nuclear family household was not significant. When controlling for structural homophily in Step 2b by adding a two-way interaction between the objective dimension and the social characteristic of living in a nuclear family household, it was also not significant. In Step 2c when the three-way interaction term for social homophily was added, it did not significantly predict subjective evaluations of the social environment.

The results relating to the objective younger nuclear family household environment were similar to those for the objective non-nuclear household environment except that the main effect for the former was positively associated with subjective evaluations of the social environment ($B = .09, p <.01$) while the latter was negatively associated ($B = -.11, p <.01$). However, more importantly for this chapter, social homophily relating to nuclear family households did not significantly predict either the objective nuclear family environment or the subjective social environment. Thus, no support was evident for the mediated or unmediated models relating to this dimension.
Table 7-7. Testing mediating effects of the objective nuclear family household environment

<table>
<thead>
<tr>
<th>Step 1. Objective social dimension (DV)</th>
<th>B</th>
<th>p</th>
<th>partial ( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social characteristic of resident</td>
<td>.50</td>
<td>&lt;.01</td>
<td>6.8%</td>
</tr>
<tr>
<td>Importance of similar people</td>
<td>-.04</td>
<td>.14</td>
<td>.3%</td>
</tr>
<tr>
<td>Step 1b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-way interaction for social homophily</td>
<td>-.02</td>
<td>.77</td>
<td>&lt;.1%</td>
</tr>
<tr>
<td>Step 2. Subjective social environment (DV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective social dimension</td>
<td>.09</td>
<td>&lt;.01</td>
<td>1.2%</td>
</tr>
<tr>
<td>Social characteristic of resident</td>
<td>.05</td>
<td>.38</td>
<td>.1%</td>
</tr>
<tr>
<td>Importance of similar people</td>
<td>.09</td>
<td>&lt;.01</td>
<td>6.2%</td>
</tr>
<tr>
<td>Step 2b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-way interaction for structural homophily</td>
<td>.01</td>
<td>.87</td>
<td>&lt;.01%</td>
</tr>
<tr>
<td>Step 2c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three-way interaction for social homophily</td>
<td>.04</td>
<td>.33</td>
<td>.1%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

7.5.2.3 Objective Older Non-Nuclear Household Environment

Table 7-8 shows statistics relating to the objective older non-nuclear household environment. When controlling for the main effects in Step 1a, the social characteristic of living in an older non-nuclear household significantly predicted the objective older non-nuclear household environment, reflecting structural homophily as before. Also as found in the previous analyses, the main effect for the subjective importance of similar people on the objective dimension was not significant in Step 1a.

However, contrary to the two previous objective dimensions relating to household structure, Step 1b showed that social homophily significantly predicted the objective older non-nuclear household environment such that residents living in older non-nuclear households were more likely to live in environments with higher percentages of older non-nuclear households if they considered that living in neighbourhoods with similar people was very important to them (see Figure 7-5).
Table 7-8. Testing mediating effects of the objective older non-nuclear household environment

<table>
<thead>
<tr>
<th>Step</th>
<th>Objective social dimension (DV)</th>
<th>Step 1a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Social characteristic of resident (structural homophily)</td>
<td>.34 &lt; .01</td>
</tr>
<tr>
<td></td>
<td>Importance of similar people</td>
<td>.01 .83</td>
</tr>
<tr>
<td></td>
<td>Two-way interaction for social homophily</td>
<td>.13 .03</td>
</tr>
<tr>
<td></td>
<td>Step 2a</td>
<td>Subjective social environment (DV)</td>
</tr>
<tr>
<td></td>
<td>Objective social dimension</td>
<td>-.13 &lt; .01</td>
</tr>
<tr>
<td></td>
<td>Social characteristic of resident</td>
<td>.05 .37</td>
</tr>
<tr>
<td></td>
<td>Importance of similar people</td>
<td>.15 .02</td>
</tr>
<tr>
<td></td>
<td>Two-way interaction for structural homophily</td>
<td>.15 .02</td>
</tr>
<tr>
<td></td>
<td>Three-way interaction for social homophily</td>
<td>-.01 .79</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

Figure 7-5. The effect of social homophily on the objective older non-nuclear household environment

Source: the author
As Figure 7-5 shows, for residents who were living in an older non-nuclear household environment, there was a significant difference between the mean for those who considered the importance similar of people very important (\(M = .42\)) and those who considered similar people not at all important (\(M = -.17\)) (\(B = .09, p < .05, \text{partial } \eta^2 = 1.6\%\)); whereas for residents who were not living in older non-nuclear households, there was no significant difference between those who considered similar people very important and not at all important (\(M = -.17\) and -.02, respectively; \(B = -.04, p > .05, \text{partial } \eta^2 = .2\%)\). However, the effect of social homophily on the objective older non-nuclear household environment was very small (\text{partial } \eta^2 = .7\%).

When controlling for the main effects in Step 2a, both the objective social dimension and the importance of similar people significantly predicted subjective evaluations of the social environment, as in previous analyses, and once again the subjective importance of similar people explained most variation in the subjective social environment (\text{partial } \eta^2 = 5.6\%).

In Step 2b when the two-way interaction term for structural homophily was added, it significantly predicted the subjective social environment (see Figure 7-6). Follow up simple slope analyses showed that the positive slope for residents in older non-nuclear households in Figure 7-6 was not significantly different from zero (\(B = .04, p > .05, \text{partial } \eta^2 = .3\%\)). However, the negative slope for residents not in an older non-nuclear household was significantly different from zero (\(B = -.14, p < .01, \text{partial } \eta^2 = 3.0\%\)). This means that the negative main effect for objective older non-nuclear household environments on the subjective social environment found in Step 2a was qualified such that the negative relationship was only significant for residents who were not living in an older non-nuclear household. However, once again, this effect was very small.

When the three-way interaction term for social homophily was added in Step 2c, it did not significantly predict the subjective social environment. Social homophily may have been fully mediated or not at all mediated by the objective social environment since the objective dimension was significantly predicted by structural and social homophily in Step 1, and the subjective social environment was significantly predicted by the objective dimension and structural homophily in Step 2 (see Figure 7-4). So another test was conducted with social homophily predicting subjective evaluations of the social environment without any controls. This analysis showed that social homophily was still not a significant predictor of the subjective social environment (\(B = .02, p > .05, \text{partial } \eta^2 = .2\%\)) suggesting there was no direct nor mediated relationship between social homophily (relating to older non-nuclear households) and subjective evaluations of the urban environment.
7.5.2.4 Objective Socioeconomic Environment

Table 7-9 shows statistics relating to the objective socioeconomic environment. When controlling for the main effects in Step 1a, once again the social characteristic of resident (i.e., socioeconomic status) was a significant predictor of the objective socioeconomic environment, reflecting structural homophily, and the main effect for the subjective importance of similar people was not significant.

In Step 1b, the two-way interaction for social homophily was found to significantly predict the objective socioeconomic environment (see Figure 7-7). Follow up simple slope analyses showed a significant positive slope for both residents who considered similar people not at all important \((B = .01, p < .05, \text{partial } \eta^2 = 3.4\%)\) and for residents who considered similar people very important \((B = .02, p < .01, \text{partial } \eta^2 = 9.4\%)\). However, the positive slope for residents who considered similar people very important was significantly greater than for residents who considered similar people not very important. This significant two-way interaction qualified the main effect found for the social characteristic in Step 1a such that residents of higher socioeconomic status were likely to live in higher objective socioeconomic environments (structural homophily); however, this was more so for residents who considered similar people as being very important (social homophily).
Table 7-9. Testing mediating effects of the objective socioeconomic environment

<table>
<thead>
<tr>
<th>Step</th>
<th>Objective social dimension (DV)</th>
<th>$B$</th>
<th>$p$</th>
<th>partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1a</td>
<td>Social characteristic of resident (structural homophily)</td>
<td>.01</td>
<td>&lt;.01</td>
<td>9.0%</td>
</tr>
<tr>
<td></td>
<td>Importance of similar people</td>
<td>.04</td>
<td>.14</td>
<td>.3%</td>
</tr>
<tr>
<td>Step 1b</td>
<td>Two-way interaction for social homophily</td>
<td>&lt;.01</td>
<td>.03</td>
<td>.7%</td>
</tr>
<tr>
<td>Step 2a</td>
<td>Objective social dimension</td>
<td>-.01</td>
<td>.82</td>
<td>&lt;.1%</td>
</tr>
<tr>
<td></td>
<td>Social characteristic of resident</td>
<td>&lt;.01</td>
<td>.51</td>
<td>.1%</td>
</tr>
<tr>
<td></td>
<td>Importance of similar people</td>
<td>.14</td>
<td>&lt;.01</td>
<td>5.2%</td>
</tr>
<tr>
<td>Step 2b</td>
<td>Two-way interaction for structural homophily</td>
<td>&lt;-.01</td>
<td>.11</td>
<td>.4%</td>
</tr>
<tr>
<td>Step 2c</td>
<td>Three-way interaction for social homophily</td>
<td>&lt;.01</td>
<td>.18</td>
<td>&lt;.1%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

Figure 7-7. The effect of social homophily on the objective socioeconomic environment

Source: the author
In Step 2a when controlling the main effects, only the subjective importance of similar people significantly predicted subjective evaluations of the social environment, explaining 5.2 percent of the variation; and in Step 2b and Step 2c, neither structural homophily nor social homophily were significant predictors of the subjective social environment, despite both of these significantly predicting the objective socioeconomic environment in Step 1. Since neither the objective social environment, structural homophily nor social homophily significantly predicted the subjective social environment, social homophily relating to socioeconomic status was not seen to have a direct or mediated relationship with subjective evaluations of the social environment. It was only related to predicting a small percentage of the variation in the objective socioeconomic environment (partial $\eta^2 = .7\%$).

7.5.2.5 Objective Disadvantage Environment

Table 7-10 shows statistics for analyses relating to the objective disadvantaged environment. As with previous analyses for Step 1a, the social characteristic of being disadvantaged significantly predicted the objective disadvantaged environment, reflecting structural homophily, while there was no main effect for the subjective importance of similar people. In Step 1b, there was no significant effect for social homophily in predicting the objective disadvantaged environment. Perhaps the importance of living near similar people others may relate less to living near other disadvantaged residents.

In Step 2a, only the importance of similar people was a significant predictor of the subjective social environment. However in Step 2b, the two-way interaction for structural homophily significantly predicted the subjective social environment (see Figure 7-8). Follow up analyses showed a significant negative association between the objective disadvantaged environment and subjective evaluations of the social environment for residents who were not disadvantaged themselves ($B = -.10, p < .01$, partial $\eta^2 = 1.4\%$). However, this was not true for disadvantaged residents. The relationship for disadvantaged residents was positive though not significantly different from zero ($B = .05, p > .05$, partial $\eta^2 = .4\%$).

When a three-way interaction term for social homophily was added in Step 2c, it did not significantly predict the subjective social environment. So despite Steps 1b and 2b showing an effect of structural homophily on both the objective disadvantaged environment and subjective evaluations of the social environment, the objective disadvantage environment was not seen as mediating social homophily because social homophily did not significantly predict the objective disadvantaged environment in Step 1b nor the subjective social environment in Step 2c. Thus, there was no support for the mediated or unmediated model for social homophily related to this dimension.
Table 7-10. Testing mediating effects of the objective disadvantaged environment

<table>
<thead>
<tr>
<th>Step</th>
<th>Objective social dimension (DV)</th>
<th>Step</th>
<th>Subjective social environment (DV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Step</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social characteristic of resident (structural homophily)</td>
<td>2a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Importance of similar people</td>
<td>3a</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>.36</td>
<td>&lt;.01</td>
<td>2.5%</td>
</tr>
<tr>
<td>-.05</td>
<td>.09</td>
<td>.4%</td>
</tr>
<tr>
<td>.06</td>
<td>.30</td>
<td>.1%</td>
</tr>
<tr>
<td>-.04</td>
<td>.13</td>
<td>.3%</td>
</tr>
<tr>
<td>.06</td>
<td>.35</td>
<td>.1%</td>
</tr>
<tr>
<td>.14</td>
<td>&lt;.01</td>
<td>5.7%</td>
</tr>
<tr>
<td>.13</td>
<td>.04</td>
<td>.5%</td>
</tr>
<tr>
<td>&lt;.01</td>
<td>.93</td>
<td>&lt;.1%</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

Figure 7-8. The effect of structural homophily associated with the objective disadvantaged environment on the subjective social environment

Source: the author
7.5.2.6 Objective Ethnic Environment

Finally, Table 7-11 shows the statistics for each step in analyses relating to whether the objective ethnic environment mediated relationships between social homophily and subjective evaluations of the social environment. In Step 1a when controlling for main effects, the social characteristic of ethnicity significantly predicted the objective ethnic environment, consistent with structural homophily, while the main effect for the subjective importance of similar people was not significant, as in previous analyses.

Table 7-11. Testing mediating effects of the objective ethnic environment

<table>
<thead>
<tr>
<th>Step 1. Objective social dimension (DV)</th>
<th>B</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social characteristic of resident</td>
<td>.49</td>
<td>&lt;.01</td>
<td>1.5%</td>
</tr>
<tr>
<td>Importance of similar people</td>
<td>.02</td>
<td>.39</td>
<td>.1%</td>
</tr>
<tr>
<td>Step 1b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-way interaction for social homophily</td>
<td>.27</td>
<td>.02</td>
<td>.8%</td>
</tr>
</tbody>
</table>

| Step 2. Subjective social environment (DV) |     |      |            |
| Step 2a                                |     |      |            |
| Objective social dimension              | -.10| <.01 | 1.6%       |
| Social characteristic of resident       | .20 | .09  | .4%        |
| Importance of similar people            | .15 | <.01 | 6.2%       |
| Step 2b                                |     |      |            |
| Two-way interaction for structural homophily | .02 | .90  | <.1%       |
| Step 2c                                |     |      |            |
| Three-way interaction for social homophily | -.02| .81  | <.1%       |

Notes: N = 724; weighted by age, sex and geographic zone
Source: the author

In Step 1b when the two-way interaction for social homophily was added, it was found to be significant (see Figure 7-9). This qualified the main effect of structural homophily such that for residents who were not ethnic, there was no significant difference in the means for those considering...
similar people very important and those considering it not at all important ($M = .02$ and -.01, respectively; $B = .01$, $p > .05$, partial $\eta^2 < .1\%$); whereas for residents who were ethnic, there was a significant difference in the means for those considering similar people very important and those considering it not at all important ($M = 1.10$ and -.01, respectively; $B = .28$, $p < .01$, partial $\eta^2 = 12.1\%$), explaining 12.1 percent of the variation in the objective ethnic environment for ethnic residents. In other words, a resident was more likely to live in a more ethnic environment if they themselves were ethnic and considered living near similar others subjectively important.

**Figure 7-9. The effect of social homophily on the objective ethnic environment**

![Graph showing the effect of social homophily on the objective ethnic environment](source: the author)

In Step 2a, when controlling the main effects of the interaction variables, the objective ethnic environment and the importance of similar people were significant; the former was negatively associated with and the latter was positively associated with subjective evaluations of the social environment. However in Step 2b, the two-way interaction for structural homophily did not significantly predict the subjective social environment, nor did the three-way interaction for social homophily in Step 2c.

Since social homophily significantly predicted the objective ethnic environment in Step 1b, it was possible that social homophily was mediated by the objective ethnic environment when predicting the subjective social environment (see Figure 7-4). So as with the older non-nuclear household environment, an additional analysis was conducted where social homophily predicted the subjective social environment without any of the control variables; and as before, the three-way interaction term for social homophily was not significant ($B = .02$, $p > .05$, partial $\eta^2 = < .1\%$). So there was no direct or
mediated relationship between social homophily (relating to ethnicity) and subjective evaluations of the urban environment.

7.5.2.7 Summary of Results for the Social Environment

In Step 1a of every analysis for the social environment, the social characteristic of residents significantly predicted the associated objective dimension of the social environment, reflecting structural homophily in the objective social environment. In contrast, the subjective importance of similar people by itself was not a significant predictor in Step 1a, as expected.

In Step 1b when the interaction between the subjective importance of similar others and the social characteristics of residents was added to represent social homophily, the interaction significantly predicted three objective dimensions of the social environment: the objective older non-nuclear household environment; the objective socioeconomic environment; and the objective ethnic environment. Thus social homophily appears to influence choice of residential neighbourhood on some objective social dimensions. However, structural homophily explained much more variation than social homophily in each objective dimensions of the social environment.

It was only possible for relationships between social homophily and subjective evaluations of the social environment to be mediated by the three objective dimensions of the social environment which were predicted by social homophily (i.e., the objective older non-nuclear household environment, the objective socioeconomic environment and the objective ethnic environment). However, the analyses in Step 2 showed that social homophily was not in fact mediated by any of these three objective dimensions of the social environment, nor were there any direct relationships between social homophily and associated subjective evaluations of the social environment. Thus there was no support for either the mediated or unmediated models relating to social homophily and objective dimensions of the social environment.

7.6 Discussion

7.6.1 Overview of Results

As part of explaining weak relationships between objective dimensions and subjective evaluations of the urban environment, this chapter tested whether objective dimensions of the urban environment mediated relationships between the subjective importance of various attributes of the urban environment and associated subjective evaluations. Generally speaking, these relationships were not mediated by objective dimensions of the urban environment (i.e., there was little support for the mediated model). However, there was some support for direct relationships between the subjective
importance of various attributes of and subjective evaluations of the physical environment relating to
subjective access and the subjective natural environment (i.e., there was some support for the
unmediated model in relation to the physical environment). But there was no such support for any
direct or mediated relationships between social homophily and subjective evaluations of the social
environment (i.e., there was no support for either the mediated or unmediated models in relation to the
social environment).

The implications relating to objective dimensions of the physical environment were somewhat
different to those for the social environment since there was support for an unmediated model for
relationships between the subjective importance of various attributes of the urban environment and
associated subjective evaluations in the physical environment but not in the social environment.

7.6.2 Implications

7.6.2.1 The Physical Environment

As mentioned, support for the unmediated model was found relating to subjective access and
the subjective natural environment. This finding is consistent with needs and aspirations adjusting
during the residential relocation process, thereby facilitating satisfaction with attributes of the urban
environment subjectively important to residents relatively independently of associated objective
dimensions of the physical environment. Thus, the residential relocation process assists in explaining
weak relationships between these objective dimensions and subjective evaluations of the objective
physical environment. This is the main implication of the findings in this chapter.

However, it is also important to note little support for either the mediated or unmediated model
in relation to objective density. This suggested the link between objective density and subjective
overloading was inherently weak. Contrasted with the fact that objective access partly mediated the
relationship between subjective importance of convenience to places and subjective access, the
possibility is highlighted of increasing urban density and objective access with a net gain in subjective
urban QOL in SEQ, as discussed in Chapter 4. However, the relationships between the objective urban
environment and associated subjective evaluations were not strong, and given that adjustment to urban
environments seems to occur more through the process of residential relocation than psychological
adjustment, consideration needs to be given to any stimulated intra-urban migration associated with
increasing urban density.
7.6.2.2 The Social Environment

Even though structural homophily significantly predicted each objective dimension of the social environment, social homophily predicted only three objective dimensions: older non-nuclear household environments, socioeconomic environments and ethnic environments. Moreover, structural homophily predicted objective dimensions of the social environment much better than social homophily. This implies social homophily is not very important in giving rise to the objective dimensions of the social environment, which is consistent with findings in Chapter 6 that social homophily is the least important reason, on average, for SEQ residents in choosing their residential neighbourhood. It also implies that other reasons may be more important in creating objective dimensions of the social environment in SEQ.

To further examine this, objective dimensions of the social environment were regressed against all reasons for choosing a neighbourhood available from the 2003 QOL Survey (see Appendix H). This showed that many other reasons significantly predicted each objective dimension of the social environment. For example, the objective younger non-nuclear household environment was positively associated with the subjective importance of being close to public transport; the objective nuclear family household environment was positively associated with the importance of good schools; the older non-nuclear family environment was positively associated with the importance of convenience to places; the objective socioeconomic environment was positively associated with the importance of an attractive appearance of the neighbourhood; the objective disadvantaged environment was positively associated with the importance of housing costs/ good value; and the objective ethnic environment was positively associated with the importance of familiarity with an area. Thus many reasons apart from structural and social homophily are important in explaining how objective dimensions of the social environment arise.

However, the focus in this thesis was on the subjective importance of similar people because this reason was most conceptually related to examining links between objective dimensions and subjective evaluations of the social environment. However, no support was found for either the mediated or unmediated models in relation to social homophily. This implies social homophily does not drive the residential relocation process and therefore does not explain weak relationships between objective dimensions and subjective evaluations of the social environment via the residential relocation process. These relationships seem inherently weak, and this is the second main implication of the findings in this chapter.
At the same time, the main effect for the subjective importance of similar people was the most important predictor of subjective evaluations of the social environment. This implies that although social homophily was not very important in predicting subjective evaluations of the social environment, another kind of psychological homophily was important like value homophily. However, other kinds of psychological homophily would not be as related to these objective dimensions of the social environment and therefore would not be as relevant in explaining weak links between these objective dimensions and subjective evaluations of the social environment. It appears that links between these objective dimensions and subjective evaluations of the social environment are inherently weak, whereas weak links between the objective dimensions and subjective evaluations of the physical environment can generally be explained via processes of residential relocation.

7.6.2.3 Conclusions

This chapter has examined the residential relocation process as potentially explaining weak links between objective dimensions and subjective evaluations of the urban environment. There was some support for residential relocation processes in explaining weak links for the objective physical environment because the unmediated model had support for three of four objective dimensions of the physical environment: objective access, the objective rural environment and the objective coastal environment. For these objective dimensions the subjective importance of associated attributes of the urban environment predicted associated subjective evaluations of the urban environment independently of the objective dimensions.

This unmediated effect can be explained in terms of adjusting needs and aspirations occurring during the residential relocation process. However, the strength of relationships between the subjective importance measures and associated subjective evaluations of the urban environment were not strong, and so the residential relocation process only goes some way in explaining weak links between objective dimensions and subjective evaluations of the physical urban environment.

In contrast, no support was found for the residential relocation process in explaining weak links between objective density and subjective overloading. There was no support for either the mediated or unmediated model, and so it was concluded that the link between objective density and subjective overloading was inherently weak.

Similarly for objective dimensions and subjective evaluations of the social environment, no support was found for the mediated or unmediated models in relation to social homophily. Similarly, social homophily was not seen as important in linking objective dimensions and subjective evaluations of the social environment, and these links were also considered inherently weak.
In the next and final chapter, Chapter 8, findings from Chapters 4, 5, 6 and 7 are brought together to derive an integrated explanation for the weak links between objective dimensions and subjective evaluations of the urban environment. This last chapter also draws together various implications for urban QOL theory and urban planning; examines limitations with this research; and it makes recommendations for future research.
Chapter 8  Discussion and Conclusions

8.1  Overview of Findings

This thesis aimed to answer two research questions: 1) What are the strength of direct links between broad objective dimensions and subjective evaluations of the urban environment? (RQ1); and 2) How do effects of psychological processes, individual and social group differences, and residential relocation influence these links? (RQ2).

Regarding RQ1, the links between broad objective dimensions and associated subjective evaluations of the urban environment were found to be weak. While subjective evaluations of the urban environment significantly predicted subjective urban QOL, little support was found for a simple mediated model of subjective urban QOL like that in Figure 8-1. This suggests links between objective dimensions and subjective evaluations of the urban environment are not direct.

Figure 8-1. A naïve model of subjective urban QOL

| Objective characteristics of the urban environment | Subjective evaluations of the urban environment | Subjective urban QOL |

Source: the author, reproduced from Chapter 1

With regard to RQ2, a range of explanations were considered to examine the extent to which they might explain weak links between objective dimensions and subjective evaluations of the urban environment: namely, psychological processes, individual and social group differences, and residential relocation processes.

Two types of psychological processes were examined: subjective judgement models and adaptation models. To test the plausibility of an explanation based on subjective judgement models, implied standards of comparison were used in combination with data on objective dimensions and subjective evaluations of the urban environment to explain indirect relationships between objective dimensions and subjective evaluations of the urban environment. The analyses showed that subjective judgement models were a plausible explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment. Moreover, the analyses showed it was likely that individual standards were close to and highly correlated with targets (or individual locations on
objective dimensions of the urban environment). This finding suggested a process which aligned individual standards of comparison with objective dimensions of the urban environment associated with individual residential locations.

Adaptation models theorise aligning of standards of comparison with their targets over time after a change. However, little support was found for this explanation relating to the urban life domain. If standards of comparison and judgements targets became aligned via adaptation to living in residential environments over time, there should have been declining variation in subjective evaluations over time after residential relocation. However, no significant difference was found in variations in subjective evaluations of the urban environment between new residents and longer term residents.

An alternative idea to aligning standards of comparison and judgement targets for explaining weak direct links between objective dimensions and subjective evaluations of the urban environment involves the idea of individual differences in what is considered subjectively important in urban environments. Where an attribute of the urban environment is considered important, we may expect a direct relationship between an associated objective dimension and subjective evaluation of the urban environment. Conversely, when an attribute is not considered important, we may expect no relationship between an associated objective dimension and subjective evaluation of the urban environment. Thus, the strength of relationships between objective dimensions and subjective evaluations of the urban environment may depend on the subjective importance individual residents place on various attributes of the urban environment.

Such a dependency may especially weaken relationships between objective dimensions and subjective evaluations of the social environment because for residents who consider living near similar people as important, the valence of the subjective evaluation (favourable or unfavourable) may also depend on the relationship between the social characteristics of the resident and their objective social environment. However, weighting the physical or social objective dimensions of the urban environment by their subjective importance did not improve prediction of subjective evaluations of the urban environment. Thus, this explanation was not an alternative to an explanation involving aligning standards of comparison and targets.

Lastly, the residential relocation process was examined as an explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment. The residential relocation process theorises aligning standards of comparison and judgement targets when choosing a residential location satisfactory to residents. According to this explanation, in choosing a residential location a resident considers attributes of the urban environment subjectively important to them. Searching and evaluating residential locations on subjectively important attributes serves to align
targets (or characteristics of vacancies) with standards of comparison because either their standards are met and a suitable vacancy is found or searching continues with some adjustment of standards until a suitable vacancy is found (L. A. Brown & Moore, 1970). Therefore standards may adjust during the searching process bringing standards and targets into close alignment.

Support was found for this explanation; however, the effects of the residential relocation process on objective dimensions of the physical environment seemed to be different to the effects on objective dimensions of the social environment. For objective dimensions of the physical environment, there were significant relationships between the importance of various attributes of the urban environment and associated objective dimensions of the physical environment. However, the importance of living in a neighbourhood with similar people was not important in predicting objective dimensions of the social environment. That is, social homophily explained very little variation in the objective social dimensions and was the least important reason on average for SEQ residents in choosing their residential neighbourhood. This implied that the residential relocation process is important in aligning standards and targets with objective dimensions of the physical environment but not with the objective dimensions of the social environment.

8.2 An Integrated Explanation of Subjective Urban QOL

The overview of findings above can be drawn together into an integrated explanation of weak relationships between objective dimensions and subjective evaluations of the urban environment which involves aligning standards and targets as part of the residential relocation process, as well as involving subjective judgement models, and differences in the subjective importance of various attributes of the urban environment (see Figure 8-2).

As is commonly found, subjective evaluations of the physical and social environments contribute to subjective urban QOL (e.g., Michalos & Zumbo, 1999; Sirgy, Rahtz, Cicic, & Underwood, 2000), which in turn contributes to moving intentions (e.g., W. A. V. Clark & Ledwith, 2006; Lu, 1998), even though moving intentions are also influenced by constraints facing individuals (e.g., Desbarats, 1983; Li, 2004). This part of the integrated explanation is well established in previous research.

1 Alternatively, a resident may decide to stay at their present location, though their standards of comparison would presumably still adjust during their search process such that staying now seemed like the best option.
The right brace (bracket) in Figure 8-2 indicates that relationships between objective dimensions and subjective evaluations of the physical environment are not direct relationships, but indirect relationships where subjective evaluations arise from differences between objective dimensions and standards of comparison relating to residents and their residential locations. As mentioned, the latter two are likely to be highly correlated and the difference between them small. This is a plausible explanation for weak relationships between objective dimensions and subjective evaluations of the urban environment given the aligning of standards and judgement targets is also explained.

Even though such aligning of standards and targets could not be explained by adaptation to residential environments over time after residential relocation, there was support for the aligning of standards and targets during the residential relocation process. The subjective importance of various attributes of the urban environment in choosing where to live predicted associated objective dimensions of the physical environment. Moreover they predicted subjective evaluations of the physical environment without being mediated by objective dimensions of the physical environment. The unmediated effects of the subjective importance of various attributes on associated subjective evaluations of the physical environment is consistent with the idea of aligning standards because it implies that residents favourably evaluate outcomes on attributes of the urban environment important to them according to their own standards, and somewhat independently of achieved outcomes on
associated objective dimensions of the urban environment. If subjective importance had been mediated by objective dimensions, standards need not have a part in the explanation.

However, as mentioned, the subjective importance residents placed on living in neighbourhoods with similar people was not very important in predicting objective dimensions or subjective evaluations of the social environment. Accordingly, the importance placed on living with people with similar social characteristics (i.e. social homophily) was not seen as giving rise to the objective dimensions of the social environment, and so there was no reason to theorise an aligning of standards and targets on these social dimensions during residential relocation.

In contrast, the objective social dimensions were reasonably well predicted by the subjective importance of attributes of the physical environment which suggests that structural homophily rather than social homophily is primarily responsible for objective dimensions of the social environment. In other words, the objective dimensions of the social environment primarily arose because residents with similar social characteristics find similar attributes of the physical environment important, more so than finding living with similar people important. Since social homophily was not important in explaining the objective social dimensions, the link between the latter and subjective evaluations of the social environment is shown as being inherently weak by a dashed line in Figure 8-2 rather than being indirect.

8.3 Implications

8.3.1 Explaining Weak Relationships in the Urban Domain Compared to Other Life Domains

The integrated explanation for weak relationships between objective dimensions and subjective evaluations of the urban environment is fundamentally different to other explanations commonly given for weak relationships between objective circumstances and satisfaction in other life domains such as work, relationships, income and health. These other explanations generally involve some psychological adaptation process which helps align perceptions of objective circumstances and standards of comparison after an event (e.g., Cummins, 2000; Diener, Lucas, & Scollon, 2006; S. Evans & Huxley, 2002; Kahneman, 1999). However, the integrated explanation for the urban life domain suggests that the aligning of standards and targets occurs primarily during the event of choosing a residential location. This simultaneous focus on choice with adjustment emphasises the active role of residents in choosing their objective circumstances to achieve satisfaction with their subjective urban QOL.
Emphasising choosing satisfactory residential locations is more proactive and purposeful than emphasizing psychological adaptation to existing objective circumstances after an event. Brickman and Campbell (1971) call the latter ‘the pessimistic theme … of the relativistic nature of subjective experience’ (p. 299) and suggest that a major difficulty in planning a good society is that members of society are on an endless hedonic treadmill where they need to keep striving to attain satisfaction in the face of continually adapting to improving objective circumstances. Kahneman (1999) also recognises a problem of pessimism relating to hedonic and satisfaction treadmills, though considers it still worthwhile to increase the relative number of pleasant versus unpleasant experiences even if standards of comparison rise and members of society end up not being more subjectively satisfied.

In contrast, the integrated explanation does not emphasise adaptation via psychological treadmills. It emphasises the proactive role of residents in choosing residential environments which provide satisfaction, in line with attributes of the urban environment subjectively important to them, even though this also involves adjusting standards of comparison and constraints. Emphasising an active role of residents is a less pessimistic view of subjective urban QOL because it emphasises satisfaction as the end of purposeful and meaningful activity aimed at meeting individual standards.

8.3.2 Changes to the Broad Conceptual Model of Subjective Urban QOL

It is worthwhile discussing the overall findings and integrated explanation with reference to the broad conceptual model by Campbell, Converse, Rodgers and Marans (1976) (used as a framework for this thesis and reproduced in Figure 8-3) keeping in mind that this thesis examined links between broad objective dimensions and subjective evaluations of the urban environment whereas the conceptual model also includes specific objective characteristics and subjective evaluations of the urban environment. How well the findings in this thesis generalise to specific objective characteristics and subjective evaluations of the urban environment is a question for future research. Nevertheless, generalisation is possible to the extent that theorised processes are similar for broad and specific characteristics of the urban environment. For comparison, a modified version of the broad conceptual model is shown in Figure 8-4 relating to broad dimensions of the urban environment based on findings from this thesis and the integrated explanation of subjective urban QOL.

In the modified version, the residential relocation process has been added to the left to indicate that a resident’s location on broad objective dimensions of the urban environment arises out of the residential relocation process which is influenced by their subjective importance of various attributes of the urban environment and their standards of comparison, both of which were found to be correlated with broad objective dimensions of the urban environment.
Figure 8-3. The broad conceptual framework

Source: adapted from Campbell, Converse, Rodgers and Marans (1976); reproduced from Chapter 1

Figure 8-4. A modified version of the broad conceptual framework

Source: the author
The influence of personal characteristics on subjective perceptions (or sensory perceptions) was not included in the modified model as the links between objective characteristics and subjective perceptions of the urban environment are assumed to be relatively direct (Campbell, Converse, Rodgers, & Marans, 1976; Marans & Rodgers, 1975). This simplifies the modified version.

Subjective evaluations of the urban environment are predicted by the difference between subjective perceptions of objective dimensions of the physical environment and standards of comparison. This notion of the difference between perceptions and standards was also in the original model, though the modified version makes this explicit in the diagram by using a right brace symbol rather than direct arrows from standards of comparison and subjective perceptions to subjective evaluations. This also emphasises the indirect nature of links between objective dimensions and subjective evaluations of the physical environment. However, the links between subjective perceptions and subjective evaluations of the social environment were shown to be inherently weak.

This thesis found that mood predicted considerable variation in subjective urban QOL, but little variation in subjective evaluations of the urban environment. Accordingly, in Figure 8-4, mood bias predicts subjective urban QOL while the arrow showing direct effects of personal characteristics on subjective evaluations of the urban environment has been removed. This supports Schwarz & Strack’s (1999) view that mood bias is more important in predicting more global satisfaction judgements rather than more specific sub-domain judgements.

While mood was the only direct personal characteristic examined when predicting subjective evaluations, personality traits of extroversion and neuroticism are highly correlated with positive and negative affect, and so the impact of personality is potentially mediated by mood (Diener, Suh, Lucas, & Smith, 1999). So these personality traits also seem not important in influencing subjective evaluations of the urban environment.

The arrow from personal characteristics to the relationships between subjective evaluations of the urban environment and subjective urban QOL was removed in the modified model because most studies have found that subjective importance does not moderate subjective evaluations in predicting satisfaction in more global domains (e.g., Andrews & Withey, 1976; Campbell, Converse, Rodgers, & Marans, 1976; Cummins, McCabe, Romeo, & Gullone, 1994; Mastekaasa, 1984; e.g., Russell, Hubley, Palepu, & Zumbo, 2006). Some authors suggest this is because very favourable and very unfavourable subjective evaluations inherently include subjective importance in their measurement (Trauer & Mackinnon, 2001; Wu & Yao, 2006a).

This thesis has tested moderating effects of subjective importance on objective dimensions in predicting subjective evaluations of the urban environment since objective dimensions don’t inherently
imply a measure of subjective importance in their measurement. However, no moderating effects were found here either. While objective measures do not inherently imply a level of subjective importance in their measurement, it seems subjective importance is incorporated into the objective dimensions via the residential relocation process. Hence, there are no arrows in the modified versions reflecting moderating effects of subjective importance.

Lastly, in the modified version, subjective urban QOL predicts moving intentions which can be moderated by constraints to moving. By retaining moving intentions in the modified model and linking them back to the residential relocation process, the dynamic and systemic nature of relationships between objective dimensions and subjective evaluations of the urban environment is emphasised. Linking intentions to move back to the residential relocation process makes explicit that objective dimensions are not exogenous factors, but are part of a dynamic model of residential satisfaction (Amerigo & Aragones, 1997).

8.3.3 Particular Objective Dimensions and Subjective Evaluations of the Urban Environment

The findings in this thesis for relationships between particular objective dimensions and subjective evaluations of the urban environment are discussed below within the context of the integrated explanation for subjective urban QOL.

8.3.3.1 Density, Access and Overloading

In this thesis, Optimal Centrality Theory (Archibugi, 2001; Cicerchia, 1999) was extended to examine the effects of increasing urban density on subjective access, subjective overloading, and subjective urban QOL (rather than the effects of place size on objective indicators of urban QOL) (see Figure 8-5).

Only a weak correlation was found between objective density and subjective access, mediated by a correlation between objective access and subjective access. The correlation between objective density and subjective overloading was even weaker and not significant. Neither were subjective overloading and subjective access significantly correlated.

In contrast, objective density was highly correlated with objective access. Cummins (2000) also found objective variables were more closely associated with each other than with subjective variables, highlighting that relationships in the objective world are not closely mirrored in the subjective world, and this questions the idea of an optimal objective density in an intra-regional context in terms of subjective urban QOL.
Notwithstanding this, there was a significant relationship between objective access and subjective access, albeit it weak, compared to no significant relationship between objective density and subjective overloading. Together with the finding that subjective access contributed more to subjective urban QOL than subjective overloading, it seems overall subjective urban QOL may be improved in SEQ by increasing access to services and facilities generally, even if this is accompanied with some increasing density (e.g., Baldassare & Wilson, 1995), and even though residents generally prefer less dense environments (e.g., Schwanen & Mokhtarian, 2004; Senecal & Hamel, 2001).

However, the weak relationship between objective density and subjective overloading may strengthen over time with increasing density and overloading problems associated with rapid growth in SEQ. The SEQ Regional Plan aims to deliver a more compact urban form and has set targets for local governments to provide 40 percent of all new dwellings within the existing urban footprint (i.e., as urban infill), rising to 50 percent in the second half of the plan (Office of Urban Management, 2005, p. 65). So the importance of subjective overloading on subjective urban QOL in SEQ may increase over time.
It is also important to remember that the relationship between objective density and subjective overloading may have been weakened by scale discordance effects (Lee & Marans, 1980), as mentioned previously. Given questions about scale discordance and changes in average density over time, it is important to review the strength of relationships between objective density, subjective overloading, and subjective urban QOL in future research.

Nonetheless, residents choose residential locations based on what is subjectively important to them and their own standards of comparison (e.g., the importance of openness and spaciousness). So increasing urban density around existing infrastructure, services and facilities – which is an integral part of the SEQ Regional Plan – is likely to stimulate residential relocation in and out of these areas.

8.3.3.2 The Natural Environment

The subjective natural environment explained significant variation in subjective urban QOL (approximately the same as that explained by subjective access and more than that explained by subjective overloading). However, the subjective natural environment was only predicted by the objective coastal environment and not the objective rural environment.

Prima facie, it may seem as if living closer to the objective rural environment does not influence subjective evaluations of the natural environment and subjective urban QOL. However, the importance of being close to natural areas (bush, creeks, beaches etc.) significantly predicted both the objective rural and coastal environments, as well as subjective evaluations of the natural environment. This paradox can be explained by the integrated explanation of subjective urban QOL.

The integrated explanation suggests that residents considering that being close to natural areas is important are more likely to locate closer to objective rural environments and are likely to favourably evaluate the natural environment in SEQ. However, due to variation in individual standards of comparison, most residents meet their own standards for proximity to natural environments. Thus most residents favourably evaluate the natural environment in SEQ, even those considering being close to natural areas less important and thus locating farther away from natural environments. Thus, the integrated explanation can also be a plausible explanation for the absence of direct relationships (as well as weak direct relationships) between objective dimensions and subjective evaluations of the urban environment, provided they are both also predicted by the subjective importance of an associated attribute of the urban environment in choosing where to live.

The finding that subjective access and the subjective natural environment were both better predictors of subjective urban QOL than subjective overcrowding has implications for explaining the broad structure of the urban environment in SEQ. If objective density has less impact on subjective
urban QOL (via subjective evaluations of overloading) compared to subjective access and the subjective natural environment, then areas with many services and facilities are likely to attract residents into higher density environments (such as inner Brisbane), as well as into areas which also have high natural amenity (such as many parts of the Sunshine and Gold Coasts).

Given that subjective overloading is less important than subjective access and the natural environment in contributing to subjective urban QOL, urban density may easily increase beyond environmentally sustainable levels unless constraints are placed on residential relocation. Many areas along the coast in SEQ are currently facing considerable environmental pressure, and the SEQ Regional Plan has an explicit strategy to limit growth in environmentally sensitive coastal areas, as well as promoting growth in inland areas close to existing infrastructure and services. The plan also limits growth in rural and other natural areas, partly for ecological reasons, but also for scenic, recreational and rural production values (Office of Urban Management, 2005).

8.3.3.3 The Social Environment

In contrast, weak links between objective dimensions and evaluations of the social environment were not explained by the residential relocation processes and subjective judgement models since social homophily was not very important in predicting objective dimensions and subjective evaluations of the social environment.

Notwithstanding this, weak direct relationships were found when predicting the subjective social environment with two of the objective social dimensions: the objective younger non-nuclear household environment and the socioeconomic environment. This lends some support to Social Disorganisation Theory where social cohesiveness may be inhibited somewhat in objective younger non-nuclear household environments (e.g., via a less stable residential environments) and facilitated in more affluent socioeconomic environments (e.g., via better access to community resources) (Sampson, Raudenbush, & Earls, 1997; R. B. Taylor, 1996). However, it seems these weak relationships are not a result of social homophily.

While social homophily was not important in explaining subjective evaluations of the social environment, psychological homophily was a significant predictor. The importance of living near similar people was a significant predictor of the subjective social environment, even though interactions between this and a resident’s social characteristics and their objective social environment were not significant predictors. So while social homophily was not important, another type of psychological homophily seems important in predicting the subjective social environment.
Lazarsfeld and Merton’s (1954) distinction between social (or status) homophily and value homophily seems applicable here. The subjective social environment may be more related to shared values rather than shared social characteristics. This assists in explaining weak links between objective dimensions and subjective evaluations of the social environment while allowing for the formation of urban subcultures relating to shared values and lifestyles in different areas (e.g., Curry, Koczberski, & Selwood, 2001; Ge & Hokao, 2006; Walmsley, Epps, & Duncan, 1998).

8.3.4 Measuring Urban QOL

8.3.4.1 Objective Urban QOL

Looking at urban QOL more generally, if different types of residents are attracted to different local areas based on what is subjectively important to them, then calculating ‘objective’ urban QOL makes little sense (including ranking urban QOL for different places). Thus it is possible for residents living in a place with a low ‘objective’ urban QOL rating to favourably evaluate their local area. For example, Cummins (2000) tells the anecdote of media interviews with residents in Lawrence, Massachusetts which was at the time rated as having the worst QOL of any place in the USA (Boyer & Savageau, 1981). However, residents living there generally reported positive evaluations of their community and an attachment to their town.

Cummins explains these positive subjective evaluations of Lawrence at the time in terms of adaptive psychological processes based on a need to maintain self-esteem (Cummins, 2000; Cummins & Nistico, 2002). In contrast, the integrated explanation of subjective QOL suggests that residents of Lawrence chose to live there because the town had attributes important to them and which met their standards.

From the perspective of the integrated explanation of subjective urban QOL, using an ‘objective’ set of weights to calculate objective urban QOL for a place is not valid. Rogerson, Findlay, Morris, and Coombes (1989) partly addressed the problem of arbitrary objective weights by recommending that objective attributes of the urban environment be multiplied by the average subjective importance of these attributes for residents. However, their approach still assumes that residents have similar sets of subjective weights across different British cities, and is still not valid assuming residents choose different places to live based on the attributes of places, subjective importance and standards of comparison.
8.3.4.2 Social Indicators

A social indicators approach collects a wide range of indicators for monitoring urban QOL to measure changes or whether standards have been met, though not necessarily to estimate an overall objective urban QOL index for ranking places (e.g., Archibugi, 2001; Cicerchia, 1996; D'Andrea, 1998; Perz, 2000).

The fundamentally different nature of objective and subjective indicators of urban QOL means it is important to include both types of indicators when examining urban QOL for places when using a social indicators approach. Objective indicators measure objective changes and whether objective standards have been met whereas subjective indicators of satisfaction measure the extent to which subjective standards or expectations have been met.

Calls to include subjective evaluations of urban QOL alongside objective indicators of urban QOL (e.g., Cutter, 1985; Diener & Suh, 1997; Marans, 2003; Santos & Martins, 2007) may be supported by emphasising the different nature and uses of these measures. Measuring the extent to which subjective expectations have been met is as important to urban planners and policy makers as measuring objective changes over time. For example, subjective evaluations are related to residential relocation (W. A. V. Clark & Ledwith, 2006; Lu, 1998) and participating in community action (Dahmann, 1985).

8.4 Main Limitations of the Study

Two main limitations with this thesis relate to using secondary data analysis and generalising from the findings. Weak links between broad objective dimensions and subjective evaluations of the urban environment may be partly due to using secondary data since the specific objective and subjective items used to construct the broad objective and subjective measures could not be perfectly matched with each other. However, the specific items were used only as indicators of the broader underlying constructs, and by constructing these broad measures using Principal Component Analysis, measurement error associated with imperfectly matched specific items was reduced. Thus, it is likely that the links between the broader constructs would still have been weak, and certainly not strong.

While focusing on broad dimensions meant the specific indicators did not need to be perfectly matched, care should be taken when generalising the findings from broad dimensions to specific characteristics of the urban environment. It is possible that relationships between corresponding objective and subjective measures of urban QOL when measured at more specific levels are stronger. For example, measures of objective and subjective access to specific services and facilities may be stronger than broader measures of objective and subjective access to services and facilities more
generally. As mentioned, generalisation is only possible to the extent that processes in the integrated explanation of subjective urban QOL relating to broad objective dimensions also apply to more specific characteristics of the urban environment.

One generic process in the integrated explanation relates to the objective physical environment where standards and targets align during the residential relocation process, though there was no evidence that weak relationships between objective dimensions and subjective evaluations of the social environment were part of this process. That is, there was no evidence that objective dimensions and subjective evaluations of the social environment were related via social homophily (considering it important to live near people with similar social characteristics).

However, the findings in this thesis relate to a sample of residents in the South East Queensland (SEQ) region, and as with any situationally specific study, there is a need to replicate these findings in other situational contexts. This means there are limitations in generalising from these results for the SEQ region in Australia to other regions in other western countries, depending on the similarity between SEQ and other regions.

Two ways in which the SEQ region may differ from many regions are that SEQ has a relatively low average density and a relative low percentage of ethnic persons compared to many regions. For example, the median dwelling density was only 6.43 dwellings per hectare and the median percentage of residents having a non-Christian religion was only 1.94 percent for resident neighbourhoods sampled in this study. The relatively low average density may assist in explaining weak relationships between objective density, subjective overloading and subjective urban QOL, and these relationships may be stronger in more densely settled and overloaded regions. Also, social homophily may be more important in regions with larger percentages for various ethnic groups, especially if ethnic tensions exist. For example, places such as Belfast, Jerusalem, and Johannesburg have polarised communities with strong ethnic identities manifesting in spatially segregated ethnic areas (Bollens, 2002).

8.5 Future Research

The integrated explanation of subjective urban QOL suggests future research directions for both objective and subjective urban QOL research. For objective QOL research, the notion of using objective weights to calculate objective urban QOL for a place is questioned. Given the emphasis on residents choosing their residential location based on what is subjectively important to them, it seems more reasonable to weight by the average subjective importance for residents choosing to live in that place. This is valid to the extent that residents of a place share a similar set of subjective importance weights.
The purpose of this notion of objective urban QOL for residents of a place would not be to compare objective urban QOL between places; this would not be possible as each place would have a different set of subjective weights. Rather, the purpose would be to objectively measure changes over time in urban QOL for residents of a place. Changes in objective urban QOL for residents of a place could be conceptualised as changes in objective urban QOL for the composition of residents in the year surveyed. This year would then be the base year for a weighted index. This approach focuses on important attributes of the urban environment for residents choosing a particular place to live, and is a potential tool for improving objective and subjective urban QOL for residents in that place.

Obviously, this notion can be extended to measuring objective urban QOL for a particular resident using their own subjective importance weights. In this case, the objective urban QOL for a resident could be compared between places because the same individual subjective importance weights would be used. An extension of this idea could be calculating individualised rankings of objective urban QOL for a range of places (e.g., as part of an automated decision support system for choosing where to live).

For subjective urban QOL research, the integrated explanation suggests that residents consider relocating when they are dissatisfied with their urban QOL to a location where they are more satisfied with attributes of the urban environment subjectively important to them. This implies local areas with different sets of attributes attract different types of residents based on what is subjectively important to them to form distinctive local areas in terms of physical and social characteristics. While the integrated explanation still predicts that residents would generally be satisfied with their subjective urban QOL, the nature of subjective urban QOL may be very different between places.

Future research may focus on identifying different types of urban environment with particular qualities of subjective urban QOL experienced by residents in those environments. This research direction can also include examining different kinds of subcultures and lifestyles within urban environments – for example, relaxed lifestyles in pleasant natural environments (e.g., Smith & Phillips, 2001; Walmsley, Epps, & Duncan, 1998) and high status consumption lifestyles in gentrified areas (e.g., E. Clark, 2005; Lees, 2000) – as well as examining the importance of value homophily in contributing to favourable subjective evaluations of the social environment.

Although the findings in this study support the integrated explanation of subjective urban QOL over the adaptation explanation in explaining weak links between objective dimensions and subjective evaluations of the urban environment, these findings should be replicated using longitudinal panel data since cross-sectional data used in this thesis is limited in examining changes over time. In a longitudinal panel study, the question of whether adjustment of standards occurs primarily during the
residential relocation process or after residential relocation may be approached by examining individual standards (e.g., acceptable criteria for residential locations) at three time periods: prior to searching for a new residential location, after choosing a new residential location and some time after moving to the new residential location. Any changes standards may also be influenced by different constraints faced by individual residents.

8.6 Summary and Conclusions

This thesis investigated the strength of links between broad objective dimensions and subjective evaluations of the urban environment relating to subjective urban QOL. In other life domains (e.g., health, relationships, income and work) links between objective circumstances and satisfaction have often been weak and this has generally explained in terms of psychological adjustment made after a change in objective circumstances. The results from this thesis found links between objective dimensions and subjective evaluations of the urban environment were also weak; though this was not explained by psychological adjustment after change.

A range of explanations were examined before developing an integrated explanation to account for weak relationships between objective dimensions and subjective evaluations of the urban environment (i.e., psychological processes; individual and social group differences in what is subjectively important in the urban environment, and the residential relocation process). The integrated explanation emphasised the active role of residents in the residential relocation process where they sought locations to meet their individual standards, even though their standards may adjust while searching for vacancies. This aligns individual standards and objective circumstances during the residential relocation process and means that residents generally have favourable subjective evaluations of their urban environment, even if they choose to live in very different urban environments.

However, this aligning of standards and objective circumstances during the residential relocation process only seemed to apply to objective dimensions of the physical environment. The subjective importance of choosing a neighbourhood with similar social characteristics to the resident (social homophily) did not only predict little variation in objective dimensions of the social environment, but they predicted less variation than did the subjective importance of physical characteristics of neighbourhoods. This implied that the formation of the objective dimensions of the social environment were largely due to structural homophily (i.e. due to residents with similar social characteristics finding similar attributes of the physical environment subjectively important). Consequently, links between objective dimensions and subjective evaluations of the social environment were seen as inherently weak. Notwithstanding this, subjective evaluations of the social environment
were significantly predicted by psychological homophily more generally, which suggests living near others with similar values rather than similar social characteristics may be an important social consideration in choosing an area in which to live.

By emphasising that individual residents find satisfaction in different types of urban environment or local areas, the integrated explanation of subjective urban QOL suggests that future research in urban QOL should pay attention to the distinctiveness of objective and subjective urban QOL in different local areas, including examining different subcultures and lifestyles. Enhancing subjective urban QOL in different areas may be pursued by enhancing the main attributes of different areas that attracted residents to them (e.g., building upon the unique character of areas); and when other more generic urban QOL initiatives are taken, at least not detracting from the main attributes of areas. Any changes significantly detracting from these main attributes are likely to create dissatisfaction among existing residents and a disequilibrium which would then stimulate the residential relocation process, reflecting the systemic nature of relationships between objective characteristics and subjective evaluations of the urban environment.
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Appendix A. Spatial Distributions of the Objective Dimensions of the Urban Environment in South East Queensland

A1. Spatial distribution of objective access in South East Queensland

Source: the author
A2. Spatial distribution of objective density in South East Queensland

Objective density

- ≥ 1.10 (≥ 1.10 - 1.79)
- 0.69 - 0.79
- 0.0917 - 0.09179
- 0.36 - 0.58
- 0.761 - 3.66

Source: the author
A3. Spatial distribution of the objective rural environment in South East Queensland

Source: the author
A4. Spatial distribution of the objective coastal environment in South East Queensland

![Map of the objective coastal environment in South East Queensland](image)

**Objective coastal environment**
- $-1.77$ - $-1.17$
- $-1.02$ - $-0.25$
- $-0.24$ - $0.16$
- $0.17$ - $0.76$
- $0.77$ - $3.00$

Source: the author
Appendix A continued

A5. Spatial distribution of the objective younger non-nuclear household environment in South East Queensland

Source: the author
A6. Spatial distribution of the objective nuclear family household environment in South East Queensland

Source: the author
A7. Spatial distribution of the objective older non-nuclear household environment in South East Queensland

Source: the author
A8. Spatial distribution of the objective socioeconomic environment in South East Queensland

Source: the author
A9. Spatial distribution of the objective disadvantaged environment in South East Queensland

Source: the author
A10. Spatial distribution of the objective ethnic environment in South East Queensland

Source: the author
Appendix B. Mean Cluster Scores for Types of Objective Urban Environment in South East Queensland

Cluster 1
- Obj. access
- Obj. density
- Obj. rural environment
- Obj. coastal environment
- Obj. younger non-nuclear households
- Obj. nuclear family households
- Obj. older non-nuclear households
- Obj. socioeconomic environment
- Obj. disadvantaged environment
- Obj. ethnic environment

Cluster 2
- Obj. access
- Obj. density
- Obj. rural environment
- Obj. coastal environment
- Obj. younger non-nuclear households
- Obj. nuclear family households
- Obj. older non-nuclear households
- Obj. socioeconomic environment
- Obj. disadvantaged environment
- Obj. ethnic environment

Cluster 3
- Obj. access
- Obj. density
- Obj. rural environment
- Obj. coastal environment
- Obj. younger non-nuclear households
- Obj. nuclear family households
- Obj. older non-nuclear households
- Obj. socioeconomic environment
- Obj. disadvantaged environment
- Obj. ethnic environment

Cluster 4
- Obj. access
- Obj. density
- Obj. rural environment
- Obj. coastal environment
- Obj. younger non-nuclear households
- Obj. nuclear family households
- Obj. older non-nuclear households
- Obj. socioeconomic environment
- Obj. disadvantaged environment
- Obj. ethnic environment

Source: the author
Appendix C. Spatial Distributions of Subjective Evaluations of the Urban Environment and Subjective Urban QOL in South East Queensland

C1. Spatial distribution of subjective access in South East Queensland

Source: the author
C2. Spatial distribution of subjective overloading in South East Queensland

Source: the author
C3. Spatial distribution of the subjective natural environment in South East Queensland

Source: the author
C4. Spatial distribution of the subjective social environment in South East Queensland

Source: the author
C5. Spatial distribution of subjective urban QOL in South East Queensland

Source: the author
Appendix D. Scatterplots of Objective Dimensions with Subjective Evaluations of the Urban Environment

D1. Scatterplot of objective access with subjective access

Source: the author

D2. Scatterplot of objective density with subjective overloading

Source: the author

1 To avoid overprinting of dots and to make the scatterplots easier to read and interpret, 30% of cases were randomly selected for display and their dots were ‘jittered’ or given a random locational disturbance up to 5% of the graph area.
D3. Scatterplot of the objective rural environment with the subjective natural environment

Source: the author

D4. Scatterplot of the objective coastal environment with the subjective natural environment

Source: the author
D5. Scatterplot of the objective younger non-nuclear household environment with the subjective social environment

Source: the author

D6. Scatterplot of the objective nuclear family household environment with the subjective social environment

Source: the author
D7. Scatterplot of the objective older non-nuclear household environment with the subjective social environment

Source: the author

D8. Scatterplot of the objective socioeconomic environment with the subjective social environment

Source: the author
D9. Scatterplot of the objective disadvantaged environment with the subjective social environment

Source: the author

D10. Scatterplot of the objective ethnic environment with the subjective social environment

Source: the author
Appendix E. Relationships between Standard Deviations of Standards, Targets and Difference Scores, as well as the Correlation Between Standards and Targets under Various Assumptions for the $b$ Coefficient\(^1\).

\(^1\)Note: Correlation (T,S) = Pearson’s correlation between targets and implied standards
SD Diff = Standard deviation of the difference scores between targets and implied standards
SD Std = Standard deviation of the implied standards
Standard deviation of the target = 1
Appendix E continued

Source: the author
Appendix F. Hypothesised Interactions with Individual Differences in Subjective Importance

Below are hypothesised relationships between objective dimensions and subjective evaluations of the urban environment, contingent on the importance of objective dimensions to residents in choosing where to live¹

¹ Note that the relationships for H1, H3 and H4 are negative for residents considering the associated attributes of the urban environment as important because the objective dimensions for H1, H3 and H4 represent distance from services and facilities; rural and rural-residential land; and the coast, respectively.
Objective younger non-nuclear household environment

Subjective social environment

Similar people not important

Younger non-nuclear household residents

Other residents

Both younger non-nuclear household and other residents

H5a

H5b

Subjective social environment

Objective nuclear family household environment

Similar people important

Nuclear family household residents

Other residents

Both nuclear family household and other residents

H6a

H6b

Subjective social environment

Objective older non-nuclear household environment

Similar people important

Older non-nuclear household residents

Other residents

Both older non-nuclear household and other residents

H7a

H7b

Subjective social environment
Appendix F continued

H8a
Similar people important

H8b
Similar people not important

Objective socioeconomic environment

Both high and low socioeconomic status residents

Subjective social environment

H9a
Similar people important

H9b
Similar people not important

Objective disadvantaged environment

Both disadvantaged and advantaged residents

Subjective social environment

H10a
Similar people important

H10b
Similar people not important

Objective ethnic environment

Both ethnic and other residents
Appendix F continued

H11

Subjective social environment

Objective younger non-nuclear household environment

Younger non-nuclear household residents

Other residents

H12

Subjective social environment

Objective nuclear family household environment

Nuclear family household residents

Other residents

H13

Subjective social environment

Objective older non-nuclear household environment

Older non-nuclear household residents

Other residents

H14

Subjective social environment

Objective socioeconomic environment

High socioeconomic status residents

Low socioeconomic status residents

H15

Subjective social environment

Objective disadvantaged environment

Disadvantaged residents

Other residents

H16

Subjective social environment

Objective ethnic environment

Ethnic residents

Other residents

Source: the author
Appendix G. Items for the Subjective Importance of Various Attributes of the Urban Environment

Response items from the 2003 QOL Survey to the question ‘How important was each of the following in your decision to move to this particular neighbourhood?’

1. close to work
2. good schools
3. housing costs/good value
4. convenience to places such as shopping and schools
5. close to public transport
6. lots of recreational opportunities
7. attractive appearance of neighbourhood
8. community size
9. people similar to you
10. appearance/layout of dwellings
11. familiar with area
12. close to natural areas (bush, creeks, beaches, etc)
13. openness/spaciousness of area
14. closeness to family and friends
### Appendix H. Regression Coefficients for Regressing Objective Dimensions of the Social Environment on Subjective Importance and Social Characteristics of Residents

<table>
<thead>
<tr>
<th>Subjective importance</th>
<th>Younger non-nuclear household environment</th>
<th>Nuclear family household environment</th>
<th>Older non-nuclear household environment</th>
<th>Socioeconomic environment</th>
<th>Disadvantaged environment</th>
<th>Ethnic environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience to places</td>
<td>.10</td>
<td>-.14</td>
<td>.15</td>
<td>-.02</td>
<td>.10</td>
<td>.08</td>
</tr>
<tr>
<td>Openness/spaciousness of area</td>
<td>-.12</td>
<td>.10</td>
<td>-.12</td>
<td>-.02</td>
<td>-.13</td>
<td>-.11</td>
</tr>
<tr>
<td>Close to natural areas</td>
<td>-.09</td>
<td>.01</td>
<td>.02</td>
<td>-.09</td>
<td>.03</td>
<td>-.09</td>
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<tr>
<td>People similar to you</td>
<td>.04</td>
<td>-.04</td>
<td>-.01</td>
<td>.04</td>
<td>-.03</td>
<td>.05</td>
</tr>
<tr>
<td>Close to work</td>
<td>.05</td>
<td>-.04</td>
<td>.01</td>
<td>.05</td>
<td>-.01</td>
<td>.01</td>
</tr>
<tr>
<td>Good schools</td>
<td>-.12</td>
<td>.14</td>
<td>-.14</td>
<td>-.08</td>
<td>-.03</td>
<td>.02</td>
</tr>
<tr>
<td>Housing costs/good value</td>
<td>&lt;.01</td>
<td>.07</td>
<td>-.02</td>
<td>-.15</td>
<td>.14</td>
<td>.02</td>
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<tr>
<td>Close to public transport</td>
<td>.12</td>
<td>-.11</td>
<td>.07</td>
<td>.12</td>
<td>-.02</td>
<td>.05</td>
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<tr>
<td>Recreational opportunities</td>
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<td>-.09</td>
<td>.09</td>
<td>.05</td>
<td>-.01</td>
<td>-.03</td>
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<td>Attractive appearance of neighbourhood</td>
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<td>.00</td>
<td>-.06</td>
<td>.12</td>
<td>-.07</td>
<td>.01</td>
</tr>
<tr>
<td>Community size</td>
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<td>.07</td>
<td>-.01</td>
<td>-.07</td>
<td>.08</td>
<td>-.09</td>
</tr>
<tr>
<td>Appearance/layout of dwellings</td>
<td>-.01</td>
<td>.04</td>
<td>-.04</td>
<td>.06</td>
<td>-.05</td>
<td>.02</td>
</tr>
<tr>
<td>Familiar with area</td>
<td>.04</td>
<td>-.01</td>
<td>-.01</td>
<td>.06</td>
<td>-.02</td>
<td>.08</td>
</tr>
<tr>
<td>Closeness to family and friends</td>
<td>-.08</td>
<td>.00</td>
<td>.04</td>
<td>-.05</td>
<td>-.01</td>
<td>-.01</td>
</tr>
<tr>
<td>Social characteristic of resident</td>
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<td>-.34</td>
<td>-.21</td>
<td>.01</td>
<td>-.33</td>
<td>-.41</td>
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<tr>
<td>- structural homophily</td>
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<tr>
<td>Social characteristic x importance</td>
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<td>.02</td>
<td>-.08</td>
<td>.01</td>
<td>-.06</td>
<td>-.39</td>
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<td>- social homophily (Step 2)</td>
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<td>adjusted $R^2$</td>
<td>.242</td>
<td>.219</td>
<td>.099</td>
<td>.225</td>
<td>.062</td>
<td>.109</td>
</tr>
</tbody>
</table>

Notes: N = 724; weighted by age, sex and geographic zone; bolded coefficients significant ($p < .05$)

Source: the author