

**“They’re not including us!” Neighbourhood deprivation and older  
adults’ leisure time physical activity participation**

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Population ageing and the tendency for older adults to have poorer health status than younger adults have raised concerns about potential increases in the number of elderly suffering disease and disability. Significantly, many health problems experienced in later life are associated with the onset of a more sedentary lifestyle. Increasing older adults’ participation in leisure time physical activity (henceforth LTPA) offers an opportunity to reduce the prevalence of preventable morbidity in later life and offset a potential burden of ageing on the public health sector. As a forerunner to the development of strategies to increase older adults’ LTPA participation, researchers have investigated the intrapersonal, interpersonal and, to a lesser extent, environmental influences on this health behaviour. Recent findings from studies of the adult population have suggested that neighbourhood deprivation, a measure of the socioeconomic conditions of small areas, may significantly influence LTPA participation.

Extending previous findings, this research investigated how neighbourhood deprivation influenced older adults’ LTPA participation. A total of 63 older adults were recruited from high- and low-deprivation neighbourhoods in Christchurch, New Zealand. Neighbourhoods were selected because of their relative positions on the New Zealand Deprivation Index and were characterised by the researcher as “East-town”, a neighbourhood of high deprivation, and “West-town”, a neighbourhood of low deprivation. The research incorporated a cross-sectional, comparative and mixed-methods approach. The methods of enquiry employed in this research included a recall survey, Q method, and semi-structured interviewing. Each method addressed a different aspect of the primary research question and provided data that was used in the creation of an integrated model depicting the influence of neighbourhood deprivation on older adults’ LTPA participation.

The results derived from the three research methods showed that older adults from the low-deprivation neighbourhood of West-town participated in LTPA more frequently than older adults from the high-deprivation neighbourhood of East-town. East-town was identified as having many physical and social environmental constraints to LTPA and comparatively few facilitators. Alternatively, West-town was found to have many physical and social environmental facilitators to LTPA and relatively few constraints. Neighbourhood attributes which appeared to influence older adults' LTPA participation included appropriateness of leisure provision, neighbourhood attractiveness, walkability, traffic, and perceptions of crime and antisocial behaviour. One implication of this research is that environmental interventions should be considered in attempts to engage older adults in LTPA for health purposes, particularly in high-deprivation neighbourhoods.

**Keywords:** Population ageing, older adult, compression of morbidity, leisure time physical activity, neighbourhood deprivation, physical environment, social environment, mixed methods.

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# Chapter One: Introduction to the research problem

## 1.1 Chapter introduction

In Aotearoa, New Zealand, the older-adult cohort is projected to grow significantly in both absolute and relative terms over the next 50 years (Statistics New Zealand, 2004). This growth is likely to be associated with an increasing prevalence of disease and disability as older adults tend to have higher rates of morbidity<sup>1</sup> than younger adults (Dunstan & Thompson, 2006; Ministry of Health, 2002a, 2004c). Significantly, much of the disease and disability in later life stems from the development of a more sedentary lifestyle, which is risk factor for a number of commonly-occurring ailments, including heart disease, cancers, strokes and type-two diabetes (Campbell, 1993; U.S. Department of Health and Human Services, 1998). An increase in the prevalence of lifestyle-related illness will not only adversely affect the wellbeing of the older-adult cohort, but will also increase the pressure on the public health sector through greater demand for health services and resources (Ministry of Health, 2004c; Stephenson & Scobie, 2002).

High and growing rates of preventable morbidity among the elderly could potentially be ameliorated by increasing older adults' participation in leisure time physical activity (henceforth referred to as LTPA). LTPA is associated with significant and well-established physical and mental health benefits, including a reduced risk of disease and disability in later life (Nelson et al., 2007; U.S. Department of Health and Human Services, 1998). Increasing older adults' participation in LTPA may help to compress morbidity into a short time at the very end of life, offsetting a so-called burden of ageing on society (Fries, 1980, 1996). Currently, however, a large proportion of the older-adult cohort is inactive and most prefer a core of leisure activities which are predominantly passive in nature (Kelly, 1996; Sport and Recreation New Zealand, 2001). The prevalence of disease and disability among the older-adult cohort and the trends toward inactivity suggest that New Zealand may soon be faced with a significant expansion of morbidity among its elderly population.

Considering the potential health gains and reduced burden to society which could be facilitated by bolstering older adults' involvement in LTPA, there has been growing interest

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<sup>1</sup> Morbidity refers to any departure from a state of physiological or psychological wellbeing (Ministry of Health, 2002a).

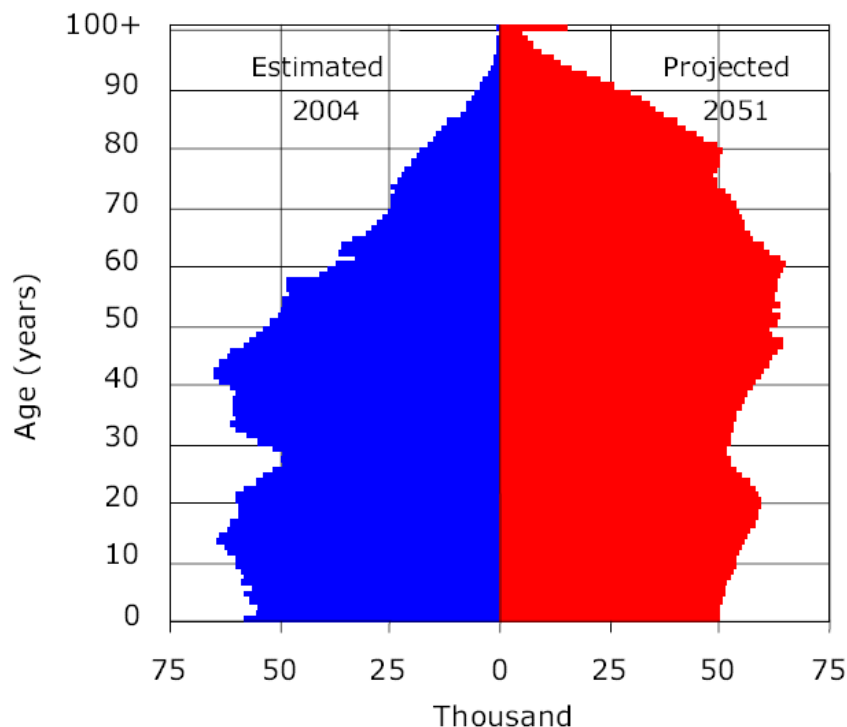
in the factors which influence older adults' participation in this health-promoting behaviour. During the past two decades, researchers working within the physical activity epidemiology paradigm have attempted to identify the determinants of older adults' LTPA as a precursor to the development of interventions and strategies to increase participation (Prohaska et al., 2006). These investigations, however, have focussed primarily on the intrapersonal and interpersonal influences on behaviour and have paid comparatively less attention to the potential environmental influences on LTPA (King, 2001). The neighbourhood environment, in particular, is one of the least studied, but potentially most significant, influences on older adults' LTPA because older adults tend to become more dependant upon and sensitive to the conditions of their immediate environment as they age. Recent research has found that physical and social characteristics of the neighbourhood environment affect older adults' engagement in LTPA (Li, Fisher, Brownson & Bosworth, 2005; Michael, Green & Farquhar, 2006) and that residing in a highly deprived neighbourhood is associated with reduced participation among adults (Giles-Corti & Donovan, 2002b; Yen & Kaplan, 1998). Building on these findings, the current research explores how neighbourhood deprivation influences older adults' LTPA participation, in the context of Christchurch, New Zealand.

The purpose of this chapter is to introduce the research problem and define key concepts employed throughout this research. The present research problem relates to neighbourhood inequities in LTPA participation and potential increases in the number of older adults suffering from preventable morbidity associated with inactivity. This study is primarily about the influence of neighbourhood deprivation on older adults' LTPA participation; however, in order to establish its significance, the broader contexts of population ageing and the health of the older-adult cohort need to be considered. In the first section of this chapter, the process of population ageing is discussed in the context of New Zealand. In the second section, the older-adult cohort is defined and its relevant characteristics are outlined. In the third section, the health implications of population ageing are considered. In the fourth section, the utility of LTPA as a means for improving the health of the older-adult cohort is discussed. In the fifth section, older adults' current and future leisure participation is considered. In the sixth section, the general influences on older adults' LTPA are outlined. In the seventh section, the influence of the neighbourhood environment is discussed, including specific references to environment, neighbourhood and neighbourhood deprivation. In the eighth section, the primary research question and the research subquestions are posed. In the ninth section, the significance of this research is stated. In the last section, the organisation of the thesis is outlined.

## 1.2 Population ageing in New Zealand

*Population ageing* refers to a transition from a younger to an older age structure which occurs when older adults become a proportionally larger share of the total population (United Nations, 2002). Population ageing is happening throughout the world, but it will initially be experienced to the greatest extent in more developed countries, such as New Zealand (United Nations, 2002). In New Zealand, the older-adult cohort is projected to grow from around 12 percent of the total population in 2005 to over 25 percent by 2051 (Dunstan & Thompson, 2006). Over the same period, the older-adult cohort will increase in absolute terms from 450,000 individuals to over 1.3 million (Dunstan & Thompson, 2006). As the older-adult cohort increases in size, the proportion of children and working-age adults will be reduced in relative terms, which will prompt an increase in the median age from 34 years in 2004 to over 45 by the middle of the century (Statistics New Zealand, 2004). If these projections prove correct, New Zealand will be faced with a radically different population composition in the near future, as shown below in Figure 1.

Figure 1: Age distribution of the New Zealand population, 2004 – 2051



(Dunstan & Thompson, 2006, p. 6)

A number of factors contribute to population ageing, but the two most significant are decreases in the total fertility rate<sup>2</sup> and increases in life expectancy<sup>3</sup> (Dunstan & Thompson, 2006). A decline in the fertility rate induces population ageing by immediately diminishing the proportion of children born into a society, thereby increasing the relative proportion of older people (Heenan, 1993). In New Zealand, the fertility rate has dropped from 2.8 children per woman during the 1950s to below the replacement level<sup>4</sup> (Dunstan & Thompson, 2006). Increases in life expectancy influences population ageing by enhancing the prospects that those born into a population will survive to old age and then live for longer as elderly people (Heenan, 1993). Since the early 1970s in New Zealand, life expectancy at birth has increased by 6.5 years for females and by 7.8 years for males (Statistics New Zealand, 2004). Changes in fertility and life expectancy which have occurred in recent decades are the result of changing family structures, women's increased participation in the workforce, improvements in medical technology and healthcare, and healthier lifestyle behaviours (United Nations, 2002; World Health Organization, 2002).

At this point, it is pertinent to consider the uncertainties that are associated with population projections. Population projections are only assumptions that are based on extrapolations from current trends in fertility and longevity and they are not indicative of an unalterable future scenario (Gee, 2002). Projections for population ageing may be invalidated by a number of nondemographic factors, including wars, natural disasters, emerging diseases, the re-emergence of infectious diseases, deleterious lifestyle changes and government decisions and policies that could drastically affect fertility and longevity and lead to unanticipated demographic changes (Gee, 2002). All of these factors could potentially influence the size and composition of New Zealand's population and raise doubts about the validity of the current population projections.

Although population projections are inherently uncertain, there are several reasons why those relating to the older-adult cohort can be accepted with relative confidence. Firstly, population ageing is driven by trends in fertility and longevity and these tend to change slowly over time (Dunstan & Thompson, 2006). Secondly, the majority of those who will

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<sup>2</sup> The total fertility rate is the average number of children that a woman would bear in her lifetime if the current fertility rates remained constant throughout her childbearing years (United Nations, 2002).

<sup>3</sup> Life expectancy is the number of years a person could expect to live if current mortality levels were to continue for the rest of that person's life (United Nations, 2002).

<sup>4</sup> The replacement level of fertility is the rate at which a population replaces itself without the need for immigration and is considered to be 2.1 children per woman (United Nations, 2002).

comprise the older-adult cohort over the projection period are already alive (Dunstan & Thompson, 2006). Thirdly, New Zealand demographers have attempted to control for projection uncertainties by producing a range of population ageing scenarios and all of these different scenarios indicate a shift towards a significantly older age structure (Dunstan & Thompson, 2006; Statistics New Zealand, 2004). Finally, throughout most of the Twentieth Century, population projections have significantly underestimated, rather than overestimated, the current pace of population ageing (Gavrilov & Heuveline, 2003).

### **1.3 The older-adult cohort**

As older adults are likely to become a more conspicuous part of New Zealand society, it is appropriate to clarify exactly what is meant by the term *older adult*. Unfortunately, there is no universal definition of an older adult as the meaning of this concept varies widely between countries and cultures (Tinker, 2002). For the purposes of this research, however, an older adult is defined simply as an individual aged 65 years or older. Age-specific definitions, such as this, are associated with retirement-related policy and legislation in more developed countries and are frequently used in research as a rudimentary tool for distinguishing members of the older-adult cohort (Rosenberg & Everitt, 2001).

Although age-specific definitions are useful for policy and research purposes, they are somewhat arbitrary and often fail to capture the inherent diversity of the older-adult cohort. In reality, the experience of later life varies from person to person and there are large discrepancies in health status, independence, social participation and material circumstances within the older-adult cohort (World Health Organization, 2002). According to Johnson (1995, p. 3),

The reality is that older adults will not fit into a single profile. Some age in good health and some age ill, some are unremarkable either way, and some have varying experiences within their own particular life course. We cannot think of ageing as a single image, but as images.

The diversity of the older-adult cohort is reflected in the many subgroups that have been identified within this population. Prominent subgroups include the following: the young old, the middle old, the oldest old, the active old, the frail old, well-off older persons, the poor old and ethnic minorities (Johnson, 1995; Patterson, 2006; Rosenberg & Everitt, 2001). Older adults in each of these subgroups are likely to have widely varying experiences of later life.

While the older-adult cohort is undoubtedly diverse, it also shares a number of characteristics which provide justification for conceptualising those aged 65 and older as a distinct social group. Relative to those in younger age cohorts, older adults prefer to age in place, subsist on a low fixed income and generally have higher rates of disease and disability. *Ageing in place* refers to older adults' preferences for remaining in their own homes and communities for as long as is practicable in later life, reflecting desires for ongoing independence and social participation (Scofield, Davey, Keeling & Parsons, 2006). The majority of older adults live alone or with a spouse in their own home and tend to change their residential location to a lesser degree than people in younger age cohorts (Heenan, 1993). Additionally, the majority of New Zealanders over the age of 65 have ended paid employment and subsist primarily on the low fixed income provided by the government pension (New Zealand Superannuation) (Paul, Rashbrooke & Rea, 2006; Statistics New Zealand, 2004). In 2001, the median annual income for an older adult was just \$13,120 per annum compared with the national average of \$18,500 (Fletcher & Lynn, 2002). Of greatest relevance to this research, however, is the older-adult cohort's tendency to have higher rates of disease and disability than younger age groups, which has raised concerns about the possible impact that population ageing will have on New Zealand society.

While there is variability in the health status of older adults, the majority of those aged over 65 have some form of chronic medical condition or disability (McGuire, Boyd & Tedrick, 2004; Statistics New Zealand, 2004). In fact, the onset of disability and chronic illness has previously been described as "the hallmark of ageing" (Ebersol & Hess, 1990, p. 343). In New Zealand, over half of all people aged 65 or older and two-thirds of those aged 75 or older have a chronic medical condition or disability (Statistics New Zealand, 2004). The most prevalent ailments among older-adult New Zealanders include cardiovascular disease, high blood pressure, cancers, strokes, type-two diabetes, chronic respiratory diseases, osteoporotic fractures, musculoskeletal diseases and sensory impairments (Cornwall & Davey, 2004). The health of the older-adult cohort is arguably an important issue associated with population ageing because if the current prevalence of poor health continues into the future, there is likely to be a substantial increase in the number of sick and disabled elderly and increased demand for health and disability support services (Fletcher & Lynn, 2002).



## 1.4 Health implications of population ageing

Older adults' tendency for poor health and disability coupled with the ageing of the population in New Zealand has the potential to significantly increase the pressure on the public health sector. Health comprises a large proportion of government expenditure, and older adults consume disproportionate amounts of the country's healthcare resources (Stephenson & Scobie, 2002). In 2002, older adult New Zealanders, comprising only 12 percent of the total population, consumed 39 percent of all public health expenditure (Fletcher & Lynn, 2002). In New Zealand, older adults are the principal users of hospital services, surgical procedures, disability support services, general practice visits, laboratory tests and pharmaceuticals (Fletcher & Lynn, 2002). The current high levels of demand for health services and resources coupled with expectations for significant growth in the older-adult cohort have raised concerns about a looming crisis in the provision of healthcare for New Zealand's elderly.

Expected growth in the older-adult cohort may lead to significantly increased public health expenditure. The Ministry of Health (2004c) has projected that public health spending will increase from 6.2 percent of gross domestic product at present to around 9.2 percent by 2051 and that those aged 65 or older will consume nearly two-thirds of this expenditure. The Ministry of Health (2004c) has argued that population ageing drives health expenditure because health spending is strongly related to age, and while age is not the direct cause of health expenditure, it is a proxy for health status because disease and disability become more prevalent in later life. Analysis of trends in age-related diseases indicate that the New Zealand health sector can expect increased demand in the coming years as a result of a growing prevalence of lifestyle-related conditions, such as cardiovascular diseases, type-two diabetes, strokes and cancers (Cornwall & Davey, 2004). The view that population ageing will lead to an increasing prevalence of disease and disability and increased health expenditure is, however, not universally accepted.

Assumptions of a future crisis in the provision of public healthcare resulting from growth in the older-adult cohort are the subject of debate. Arguably, it is the demand for and cost of health and disability support services, rather than population ageing per se, that determines health expenditure (Ministry of Health, 2004c; Stephenson & Scobie, 2002). Fletcher and Lynn (2002, p. 110) have acknowledged that,

There is no simplistic relationship between population ageing and future demand for, or cost of, health and disability support services. Attempts to project future demand need to take account of trends in a range of variables that have been shown to affect the demand. These include increasing life expectancy, changes in health status and prevalence of disability, technological advances, rising expectations of health and support services and expectations of what should be publicly funded.

Taking into account the wide range of variables which influence health expenditure, it has been suggested that population ageing may, in fact, have a negligible impact on public health provision and that older adults are unlikely to be the burden on the public health system that has been depicted (Gee, 2002). It should also be noted that the demand for and consumption of healthcare resources is not uniform across the older-adult cohort, but concentrated towards the oldest age groups who have the highest risk of disease and disability (Cornwall & Davey, 2004). Thus, it may be unfair and incorrect to group older adults into a single category of universal demand on New Zealand's public health services and resources.

In spite of conjecture about the impact that population ageing will have on the public health sector, the available evidence points to substantial increases in demand over the next 50 years. Economic projections of future health costs and analysis of the trends in health expectancies are unequivocal in their conclusions that, while there is unlikely to be a crisis in the public health sector, there will be significantly increased demand for health and disability services and resources as a result of population ageing and the high prevalence of disease and disability among the older-adult cohort (Cornwall & Davey, 2004; Ministry of Health, 2004a, 2004b, 2004c; Stephenson & Scobie, 2002).

Crucially, the extent to which population ageing will lead to increased demand for health and disability services and resources has much to do with future trends in longevity and morbidity (Cornwall & Davey, 2004; Fries, 1980, 2003). In more developed countries, such as New Zealand, life expectancy is increasing; however, it is not clear whether the additional years that the average person can expect to live will be healthy or characterised by disease and disability. If longevity gains are greater than reductions in morbidity, demands for health and disability services among older adults will increase dramatically as the population ages (Fletcher & Lynn, 2002). This scenario is referred to as the *expansion of morbidity* (Ministry of Health, 2004c). Alternatively, if there is widespread improvement in the health status of older people, so that the longer years lived are lived in good health, then the expected demand for and costs of healthcare provision associated with population ageing will not be as great as feared (Jacobzone, 1999). This scenario is referred to as the *compression of morbidity* (Fries,

1980). The future impact that population ageing has on demand for and consumption of health and disability services and resources is dependant on whether or not a significant compression of morbidity can be achieved among the older-adult cohort.

The compression of morbidity (Fries, 1980) asserts that through the uptake of healthful lifestyle behaviours and advances in the treatment of illness and disability many of the commonly occurring diseases and disabilities that are normally associated with old age can be compressed into a short period at the very end of life. The compression of morbidity thesis is based, in part, on the assumption that old age is not naturally associated with disease and disability, but that many of the declines in health and functioning that are experienced in later life result from negative lifestyle behaviour, such as the development of a more sedentary lifestyle (Campbell, 1993; Fries, 1996). Fries (1996) has argued that there is tremendous potential for positive lifestyle behaviours to facilitate a compression of morbidity, providing many years of healthy and independent living in later life and offsetting the healthcare burden of population ageing. In New Zealand, the Ministry of Health (2004c, p. 34) has accepted this perspective: “Achieving a plausible degree of compression of morbidity could partially mitigate ageing pressure and so restrict the total increase in health expenditure as a percentage of GDP by up to one third”.

Among the possible mechanisms for facilitating a widespread compression of morbidity among the older adult population, physical activity is perhaps the most obvious of the variables which might reduce overall lifetime morbidity (Fries, 1996; World Health Organization, 1998). Other potentially significant influences on older adults’ health include dietary habits, smoking status, alcohol consumption and exposure to environmental stressors (Ministry of Health, 2003). Physical activity, however, is thought to be most amenable to change because it can be undertaken at low cost and in a variety of modes and settings which are suited to the preferences and circumstances of individuals (O'Brien Cousins, 1997). If sufficient numbers of older adults were to become more physically active, a substantial compression of morbidity may become achievable. This would help to improve the health status of the older-adult cohort and offset future demands on the public health sector associated with population ageing.

## 1.5 The utility of leisure time physical activity

*Physical activity* refers to “any bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure” (U.S. Department of Health and Human Services, 1998, p. 21). Physical activity is a broad behavioural concept which is undertaken in a variety of contexts: as transportation, as part of paid employment, as regular household duties or as leisure time activities (U.S. Department of Health and Human Services, 1998). The greatest interest in the different domains of physical activity has been for *leisure time physical activity* (LTPA) because the potential for changing behaviours is thought to be the greatest in this domain (Booth, 2000). LTPA refers to purposive activity that is performed during exercise, recreation, sport or at any additional time other than that associated with regular home duties, occupation or transportation (Ministry of Health, 2007). LTPA is a particularly relevant concept for older adults because they tend to have more leisure time available than people in younger age cohorts (Lietner & Lietner, 2004). International research has shown that retirement frees around 25 hours per week for men and 18 hours per week for women (Robinson & Godbey, 1999). While some of this time is taken up with increased work around the home, there is still a considerable gain which could potentially be filled with health-promoting behaviours, such as LTPA (Rojek, 2005). Filling a small proportion of older adults’ leisure time with physical activity has the potential to produce significant health benefits. If these benefits become manifest within the older-adult cohort, it is likely that a compression of morbidity will be realised.

Regular participation in LTPA is associated with many physical and mental health benefits. A plethora of epidemiological evidence has established positive associations between regular LTPA participation and a reduced risk of developing a number of health conditions that become more prevalent in later life, including cardiovascular disease, hypertension, elevated cholesterol, strokes, certain cancers, type-two diabetes, obesity, osteoporosis and osteoarthritis (Dishman, Washburn & Heath, 2004; Nelson et al., 2007; U.S. Department of Health and Human Services, 1998). As well as reducing the risk of disease, regular participation in LTPA helps older adults to maintain their independence and mobility, reduces the frequency of falls and injuries from falls, improves balance and coordination, helps people with chronic disabling conditions to improve their stamina and muscle strength, and helps to control the joint pain and swelling associated with arthritis (U.S. Department of Health and Human Services, 1996; World Health Organization, 1998). In addition to the

positive physiological outcomes, preliminary research findings are also beginning to show that positive mental health benefits can result from engagement in LTPA. Regular participation in LTPA has been found to prevent or delay cognitive impairment and to reduce the symptoms of depression and anxiety in older adults (Nelson et al., 2007; Ruuskanen & Ruoppila, 1995; World Health Organization, 1998; Yaffe, Barnes, Nevitt, Lui & Covinsky, 2001).

While there are significant health benefits associated with older adults' LTPA participation, it is also pertinent to consider the potential risks. When increasing their levels of activity, older adults' risk musculoskeletal injury, overexertion and exhaustion, and aggravating pre-existing health conditions (O'Brien Cousins, 1997). There is also a small risk of heart attack and sudden death in untrained adults who have pre-existing atherosclerosis (U.S. Department of Health and Human Services, 1998). These risks, however, can be mitigated by starting slowly, building frequency and intensity incrementally and by gaining a medical clearance before increasing physical activity (U.S. Department of Health and Human Services, 1998). The World Health Organisation (1998, p. 4) has downplayed the risks of physical activity: "The benefits to be gained from sensible physical activity considerably outweigh the potentially adverse effects". The significant health benefits, and comparatively few risks, have made regular participation in LTPA a key mechanism for improving the health of the older-adult cohort. The American College of Sports Medicine has stated that, "Given the breadth and strength of the evidence, physical activity should be one of the highest priorities for preventing and treating disease and disablement in older adults" (Nelson et al., 2007, p. 9).

In recognition of the well-established health benefits of LTPA, improving the activity levels of older adults has been adopted as a major goal of international health organisations and government agencies. In 2002, the World Health Organisation adopted the "Active Ageing Policy Framework" which aims to promote healthy and active ageing as a way of improving quality of life and social participation in old age. The World Health Organisation (2002, p. 23) has stated,

Participation in regular, moderate physical activity can delay functional declines. It can reduce the onset of chronic diseases in both healthy and chronically ill older people . . . Policies and programmes should encourage inactive people to become more active as they age and provide them with opportunities to do so.

In New Zealand, policies such as the “New Zealand Positive Ageing Strategy” (Ministry of Social Policy, 2001) and the “Health of Older People Strategy” (Ministry of Health, 2002b) encourage independence, participation and health in old age and promote the relationship between lifestyle behaviours, health status and ageing (Grant, 2002). New Zealand government agencies promote physical activity as both a tool for making individual health gains and as a social panacea. According to the Ministry of Health (2003, p. 32), “Improving the physical activity levels of older people can have significant health, social and economic benefits, including reduction in the incidence and prevalence of common chronic conditions in this age group”. Although the promotion of LTPA among older adults has become an increasingly significant objective for the New Zealand government and the World Health Organisation, there are some misgivings about the increasing focus on being active in old age.

Katz (2000) has argued that the relatively recent focus on being active in old age has ushered in a polarity in thinking which defines activity as a universal good and inactivity as a risk factor:

Most gerontological and policy discourses pose activity as the positive against which the negative forces of dependency, illness and loneliness are arrayed. However, retired and older people understand that the expectations for them to be active present a more complex issue than that suggested by the typical positive/negative binarism inherent in activity programs and literature. Specifically, as neo-liberal anti-welfarist agendas attempt to restructure dependency through an uncritical promotion of positive activity they also problematise older bodies as dependency prone and at risk (Katz, 2000, p. 147).

Katz is concerned that the activity rhetoric espoused by governments and health organisations blames older adults for their health outcomes and stigmatises those who choose to be inactive. It may, however, be unfair to hold older individuals responsible for their own health outcomes because there are broader social and cultural forces which shape and constrain health in later life, and not all older people have the freedom or resources to opt for healthier lifestyles (Grant, 2002; White, Young & Gillett, 1995). The focus on activity in later life has also been criticised for giving pre-eminence to health and wellbeing and for prescribing an optimal and, for some, unattainable standard and for paying comparatively less attention to the subjective experience of ageing (Johnson, 1995). Moody (1988) has noted that the “frenzy of activity” which punctuates health promotion rhetoric ignores or downplays the benefits of more passive activities, such as socialising with family and friends, which may be integral to a balanced and satisfying experience of later life.

In promoting LTPA among older adults, care must be taken to avoid unnecessarily problematising older bodies, blaming individuals for their poor health status or demanding high levels of physical activity at the expense of valued passive activities. At the same time, however, it should also be acknowledged that inactivity is a serious risk factor for preventable morbidity in later life which cannot go unchecked in the face of a growing older adult population. Considering that much of the disease and disability in later life is associated with the development of more sedentary lifestyles and that the benefits of physical activity have been well established, governments and health organisations may be justified in promoting LTPA as an upstream mechanism for preventing disease and disability.

## 1.6 Older adults' leisure participation

Despite the many benefits that are associated with regular participation in LTPA, a large proportion of older New Zealanders remain inactive<sup>5</sup>. Survey research, conducted over the last two decades in New Zealand, has found that participation in LTPA declines with age and that between 29 to 40 percent of older adults are insufficiently active to benefit their health (Galgali, Norton & Campbell, 1998; Grant, Jones, McLean & O'Neill, 2007; Hillary Commission for Recreation and Sport, 1990; Sport and Recreation New Zealand, 2001). As people grow older, they tend to reduce their participation in leisure activities, and physically demanding activities are the most likely to be abandoned or avoided in later life (Kelly, 1993; Patterson, 2006; Roberts, 2006). The consequences of reduced LTPA participation have been summarised by Dishman et al. (2004, p. 358):

As people grow older, they generally become less physically active. This reduced activity contributes to a lowering of capacity beyond that related to chronic health conditions, disease or age. This leads to a negative spiral of deterioration and a loss of autonomy and reduction in quality of life.

For the majority of older adults, leisure participation typically revolves around a core of activities that are passive, accessible, familiar, low cost, home based or close to home, and family or peer oriented (Kelly, 1996). In accordance with this *leisure core*, the most common leisure activities in which older adults participate include watching television, reading, listening to music and to the radio, socialising with friends and family, and working on projects around the home (Kelly, 1996; Patterson, 2006; Roberts, 2006; Strain, Grabusic,

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<sup>5</sup> An individual can be described as inactive if they perform less than 30 minutes of moderate-intensity physical activity on most, if not all, days of the week (Ministry of Health, 2003).

Searle & Dunn, 2002). When older adults choose to be active, they prefer activities that are in keeping with the leisure core, particularly those that are low cost, accessible and close to home (Kelly, 1996; King, 2001). International and domestic research indicates that walking is older adults' most preferred LTPA followed by activities such as gardening, home exercise, bowls and golf (Galgali et al., 1998; King, 2001; Sport and Recreation New Zealand, 2001). In the main, however, the older-adult cohort is defined by preferences for passive leisure activities and reduced LTPA participation.

If the current high levels of older adult inactivity become manifest among the larger future cohorts of older adults, then it is likely that there will also be an increase in the number of older adults suffering from preventable morbidity (Prohaska et al., 2006). It is possible that future cohorts of older adults will be more active than the current generation because of their increased exposure to a variety of sports and exercises throughout their lives and public health messages about the benefits of regular physical activity, but this is not certain (Grant, 2002). It is equally foreseeable that older people will not substantially increase their participation in LTPA and that many will choose to remain sedentary in spite of efforts by health-promoting organisations (Grant, 2002). This is because leisure involvement in later life is characterised by massive continuities, and older adults who have not been effectively socialised into physical activity in their younger years are unlikely to suddenly become active in their old age (Kelly, 1996; Roberts, 2006). The current prevalence of inactivity and the potential for continuing patterns of sedentary lifestyle behaviour among the older-adult cohort has spurred researchers to investigate the influences on LTPA participation in later life.

## **1.7 Influences on LTPA participation**

Most of the research that has investigated the influences on older adults' LTPA has been undertaken within the *physical activity epidemiology* paradigm and, to a lesser extent, the *leisure studies* paradigm. Physical activity epidemiology studies the factors that are associated with participation in physical activity and the relationship between physical activity and disease and disability (Dishman et al., 2004). Within this paradigm, there has been a growing focus on the identification of the *determinants* of older adults' LTPA. Determinants are variables that have been found to be associated with certain behaviours, such as LTPA, but which have not necessarily been confirmed as a cause of such behaviours (Dishman et al., 2004). A determinant can be either negatively or positively associated with LTPA and can



either restrict or promote participation. The leisure studies paradigm has also investigated the influences on LTPA participation; however, the focus of investigations within this paradigm has been on the more holistic concept of *leisure*, which incorporates both passive and active pursuits and emphasises the enjoyment and self-fulfilment derived from participation as much as the health benefits (Godbey, Cladwell, Floyd & Payne, 2005). There is a body of theory and research within this paradigm regarding the *facilitators* of and *constraints* to leisure. Facilitators and constraints can be thought of in the same way as determinants are within the physical activity epidemiology paradigm. Facilitators are factors that promote the formation of leisure preferences and encourage or enhance participation (Raymore, 2002). Constraints, on the other hand, are factors that intervene between leisure preferences and leisure participation (Crawford & Godbey, 1987).

Within the physical activity epidemiology and leisure studies paradigms, the influences on older adults' participation in LTPA and leisure have been conceptualised as *intrapersonal*, *interpersonal* and *environmental* (Crawford & Godbey, 1987; King, 2001). The majority of the research that has been undertaken within the physical activity epidemiology and leisure studies paradigms has focussed on the intrapersonal and interpersonal (individual-level) influences on older adults' LTPA (King, 2001). Intrapersonal influences refer to the characteristics of an individual, including personal attributes, psychological conditions, knowledge and developmental history (Godbey et al., 2005; McLeroy, Bibeau, Steckler & Glanz, 1988). Interpersonal influences refer to an individual's interactions and relationships with significant others, including family members, friends and work mates (Godbey et al., 2005; McLeroy et al., 1988). Environmental influences on LTPA have traditionally received scant attention from researchers because of concerns about committing the ecological fallacy<sup>6</sup>, the relative ease with which intrapersonal and interpersonal influences can be conceptualised and measured, and a dominant ethos of individualism that prevailed in society for most of the Twentieth Century (Diez-Roux, 2001; Macintyre, Ellaway & Cummins, 2002). Recent investigations within the physical activity epidemiology paradigm, however, have begun to show that environmental factors may also be significant determinants of older adults' LTPA participation (Li et al., 2005; Michael et al., 2006).

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<sup>6</sup> The ecological fallacy is an erroneous assumption that something learned about an ecological unit says something about the individuals making up that unit (Babbie, 2004).

## **1.8 The influence of neighbourhood environment**

### **1.8.1 Environment**

The *environment* refers to one's surroundings or to the settings or conditions in which a particular activity is undertaken (Bell, Greene, Fisher & Baum, 2001; Pearsall, 1998). A fuller definition that could be considered has been provided by Lawton (1993, p. 31):

Environment, in objective terms, consists of a complex of opportunities and barriers from which a person seeks optimal stimulation. The whole of all that could be called objective environment is rarely relevant to the individual. The vagaries of happenstance and the rewards and punishments provided in particular environments constitute the relevant aspects of environment for the person. A major aspect of environment is composed of other people in physically or functionally close interaction with the person, the social norms of the environment, and the cultural values inherent in that environment.

Within this broad rubric, *physical environment* and *social environment* are among the most important aspects of one's surroundings that potentially influence behaviours, including LTPA participation (Diez-Roux, 2001). The physical environment refers to all of the nonbiological elements of one's surroundings, both natural and manmade (Bell et al., 2001). The physical environment can either facilitate or constrain behaviour by way of climate, topography, land use, design, safety, housing density, and the proximity and accessibility of facilities and services (Sallis, Bauman & Pratt, 1998). The social environment, on the other hand, refers to the people and groups among whom one lives (Bell et al., 2001). The social environment influences behaviour by shaping norms, enforcing patterns of social control, providing or not providing opportunities to participate in certain behaviours, reducing or producing stress, and placing constraints on individual choice (McNeill, Kreuter & Subramarian, 2006). One environment which is likely to significantly influence older adults' LTPA participation is the *neighbourhood*.

### **1.8.2 Neighbourhood**

Neighbourhood can be defined as "the area immediately around one's home, which usually displays some homogeneity in terms of housing type, ethnicity or socio-cultural values" (Parcione, 2001, p. 31). Sociologists and geographers have long recognised the significance of neighbourhoods as structural conditions which shape behaviours and

opportunities (Massey, Gross & Eggers, 1991; Peet, 1975). Neighbourhood is likely to be a particularly important context with regards to older adults' LTPA participation because those aged 65 and older generally prefer activities that can be undertaken in close proximity to their home (Kelly, 1996; King, 2001). Moreover, the reduced health status, low fixed income and ageing in place which characterise the older-adult cohort contribute to a geographical constriction in the leisure sphere, whereby neighbourhood becomes an increasingly important locus of activity (Kelly, 1990, 1996; McGuire et al., 2004). Recent research has identified that physical and social characteristics of the neighbourhood environment are associated with older adults' participation in LTPA (Booth, Owen, Bauman, Clavisi & Leslie, 2000; Li et al., 2005; Michael et al., 2006). Importantly, however, the influence of neighbourhood on LTPA is not homogeneous across areas, but appears to differ in relation to the prevailing socioeconomic conditions that exist within each neighbourhood.

### **1.8.3 Neighbourhood deprivation**

*Neighbourhood deprivation* refers to the socioeconomic conditions that prevail within a small geographical area (Salmond & Crampton, 2002). A high-deprivation neighbourhood is an area which is composed of individuals who collectively exhibit low socioeconomic status, whereas a low-deprivation neighbourhood is an area composed of individuals who collectively exhibit high socioeconomic status (Salmond & Crampton, 2002). Neighbourhood deprivation is often used as a proxy measure for the quality of the physical and social environment which exists in a certain area (Pickett & Pearl, 2001). Epidemiological evidence has found that high neighbourhood deprivation is associated with poor health and reduced participation in a range of health behaviours (Haan, Kaplan & Camacho, 1987; Macintyre, Maciver & Sooman, 1993). A small number of studies have also identified that residing in a high-deprivation neighbourhood is associated with reduced participation in LTPA among adults and that this effect is mediated by negative aspects of the physical and social environment (Giles-Corti & Donovan, 2002b; Yen & Kaplan, 1998). Kelly and Freysinger (2000) have argued that older adults who live in deprived neighbourhoods are more likely to be exposed to a greater array of environmental constraints to leisure participation than those who live in more affluent neighbourhoods. To date, however, there has been a dearth of research which has explored the influence of neighbourhood deprivation on the LTPA participation of older adults.

## 1.9 Research questions

This thesis is informed by research which has found that the physical and social conditions of neighbourhoods influence older adults' LTPA participation and studies which have shown that residence in a high-deprivation neighbourhood is associated with reduced LTPA participation among adults. This research builds on both of these findings to investigate a new area of enquiry associated with older adults' LTPA participation and neighbourhood deprivation. The overall question of this research is as follows: how does neighbourhood deprivation<sup>7</sup> influence older adults' LTPA participation? To address the primary question, three subquestions are posed:

1. What is the pattern and prevalence of LTPA participation among older adults who live in high- and low-deprivation neighbourhoods?
2. What kinds of neighbourhood leisure settings<sup>8</sup> do older adults who live in high- and low-deprivation neighbourhoods prefer?
3. What are the perceptions of neighbourhood LTPA among older adults who live in high- and low-deprivation neighbourhoods?

The three research subquestions are linked by their association with LTPA behaviour and their capacity for identifying possible influences (intrapersonal, interpersonal and environmental) on older adults' LTPA participation. The first and third subquestions are directly concerned with LTPA behaviour and the influences on LTPA participation. The second research subquestion identifies environmental preferences, in the form of neighbourhood leisure settings, associated with LTPA behaviour. In the leisure studies and physical activity epidemiology literature *preference* is often conceptualised as a precursor to behaviour or participation (Crawford, Jackson & Godbey, 1991). In this research, a preferred leisure setting is conceptualised as a setting in which LTPA is likely to be undertaken.

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<sup>7</sup> As defined by the NZDep2001 index of deprivation (Salmond & Crampton, 2002). NZDep2006 data were not available at the time this research was conducted.

<sup>8</sup> In this research, neighbourhood leisure settings refer to locations within one's neighbourhood where LTPA can be undertaken. Examples include tennis courts, bowling greens and footpaths.

## **1.10 Significance of the research**

The anticipated growth in the absolute size and proportion of the older-adult cohort and the high number of elderly who are presently inactive raises the potential for large increases in the number of older adults suffering from disease and disability associated with sedentary lifestyle behaviour. Health organisations and epidemiologists have called for more research which identifies the determinants of older adults' LTPA as a forerunner to the development of effective interventions which can increase participation and reduce preventable morbidity in later life (Prohaska et al., 2006; World Health Organization, 2002). Most of the research that has investigated the influences on older adults' LTPA, however, has focussed on individual-level determinants and more research is required which sheds light on the environmental influences on older adults' LTPA participation (Grant, 2002; King, 2001). Neighbourhood deprivation is a potentially significant, but under-studied, environmental influence on older adults' LTPA participation.

This research adds to the body of international literature relating to the environmental influences on older adults' LTPA. In particular, this research reveals the extent to which neighbourhood deprivation influences older adults LTPA participation and identifies potential pathways by which this neighbourhood effect may be mediated. This research also helps to establish the relevance of environmental determinants for explanations and theories of older adults' LTPA behaviour. Finally, this research may provide useful data which could inform the development of interventions and policies aimed at increasing older adults' participation in LTPA for the purpose of improving health-related quality of life.

## **1.11 Organisation of the thesis**

The remainder of this thesis is organised into the following chapters: literature review; methods; results; discussion; and limitations, implications, recommendations and conclusion. The literature review chapter provides a critical discussion of the theory and research relating to intrapersonal, interpersonal and environmental influences on older adults' LTPA. The methods chapter describes and discusses the sampling of the neighbourhoods under investigation, the sampling and recruitment of respondents, the research design, the methods of enquiry and data analysis. The results chapter presents the findings arising from the three methods of enquiry employed in this research: a recall survey, Q method and semi-structured

interviewing. These findings are presented separately and no attempt is made to compare and contrast across the different methods in the results chapter. The discussion chapter begins with separate discussions of the findings from each of the three methods in relation to the previous literature and the primary research question. Following individual discussions, a model is presented and explained which integrates the findings of the three research methods to show how neighbourhood deprivation influences older adults LTPA participation. The final chapter of this thesis presents the limitations of the study, implications of the findings, recommendations for future research and a conclusion.

## Chapter Two: Literature Review

### 2.1 Chapter introduction

This chapter outlines the relevant theory and evidence relating to the intrapersonal, interpersonal and environmental influences on older adults' leisure time physical activity (LTPA) participation. This literature review is grounded primarily in the physical activity epidemiology paradigm and focuses most attention on the theories of behaviour change which are a part of this paradigm. The first section explains the rationale for following the epidemiological approach. Next, the intrapersonal and interpersonal theories of behaviour change and the associated determinants of older adults' LTPA participation are presented. The merits and problems of intrapersonal and interpersonal theory and research are then considered. After this, ecological theory, the theoretical foundation for research into environmental influences on LTPA, is outlined, and the epidemiological evidence pertaining to neighbourhood influences on older adults' LTPA participation is presented. This is followed by an appraisal of the problems and merits of environmental theory and research. Finally, the limitations of and gaps in the previous research literature are outlined as a prelude to the methods chapter which follows this literature review.

### 2.2 Physical activity epidemiology and theories of behaviour change

This research predominantly follows the physical activity epidemiology paradigm. Physical activity epidemiology relates well to this research because it is founded on arguments for the health-promoting and disease- and disability-preventing effects of physical activity (Dishman et al., 2004). The overwhelming majority of the research which has been undertaken to identify the influences on older adults' LTPA participation, including environmental influences, has been conducted within the physical activity epidemiology paradigm<sup>9</sup>. Moreover, the theory and research associated with this paradigm has informed the development of interventions and strategies aimed at increasing LTPA participation (U.S. Department of Health and Human Services, 1998).

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<sup>9</sup> Research investigations into the influences on older adults' LTPA participation have often been reported in the following epidemiological journals: *The American Journal of Public Health*, *The American Journal of Preventive Medicine*, *The American Journal of Epidemiology*, *The American Journal of Health Behaviour*, *The International Journal of Epidemiology*, *Preventive Medicine*, *The International Journal of Behavioural Nutrition and Physical Activity*, *The Journal of Epidemiology and Community Health*, *Social Science and Medicine*, and *Health and Place*.

Traditionally, research conducted within the physical activity epidemiology paradigm has been grounded in the *theories of behaviour change*. These theories attempt to understand why people do or do not participate in LTPA and identify factors that are likely to influence participation (Caserta, 1995; U.S. Department of Health and Human Services, 1998). The theories of behaviour change have traditionally emphasised intrapersonal and interpersonal (individual-level) influences on behaviour (King, Stokols, Talen, Brassington & Killingsworth, 2002). Theories of behaviour change which have most commonly been employed to explain older adults' participation in LTPA include the *Health Belief Model*, the *Transtheoretical Model*, the *Theory of Planned Behaviour* and *Social Cognitive Theory*. These theories are not mutually exclusive and a number of key concepts are shared between them (Dishman et al., 2004). In addition to the theories of behaviour change and in keeping with a prevailing focus on the individual-level influences on LTPA, physical activity epidemiology also recognises the influence of demographic factors, such as age and sex, on LTPA participation. For the purposes of this research, these factors are conceptualised as intrapersonal determinants of LTPA participation.

Physical activity epidemiology and the associated theories of behaviour change are not the only perspective that could be applied to understand the influences on older adults' LTPA participation. The theories of ageing, from the gerontological paradigm, and the theories of leisure constraints and facilitators, from the leisure studies paradigm, offer important ways of conceptualising and investigating the influences on older adults' LTPA participation. These perspectives are mentioned, where applicable, during this literature review. For the most part, however, this research follows the physical activity epidemiology paradigm because the theory and research associated with this perspective are congruent with the current research problem.

### **2.3 Intrapersonal theories of physical activity behaviour**

The intrapersonal theories of behaviour change conceptualise LTPA participation as the product of individual characteristics. Examples of the intrapersonal perspectives that relate to older adults' participation in LTPA include the Health Belief Model, the Transtheoretical Model, cohort demographics and the theories of ageing. Although not theories of behaviour change, cohort demographics and the theories of ageing are significant because they recognise



that the older-adult cohort faces different issues and challenges to younger age groups and highlight the importance of age as an influence on LTPA participation.

### **2.3.1 The Health Belief Model**

The Health Belief Model (Becker, 1974) contends that participation in health-promoting behaviours, such as LTPA, is the result of individuals' perceptions of their current health status, their perceived susceptibility to disease or disability and their beliefs and knowledge about the benefits and costs of taking preventative actions (Dishman et al., 2004; Weinberg & Gould, 1999). For example, if an older adult perceives that they are at risk of health problems associated with an inactive lifestyle and believes that increasing their LTPA participation will reduce their risk of disease, then they are likely to become more active as a result. Thus, the influences on LTPA that are associated with this theory include an individual's beliefs and knowledge about physical activity and their level of motivation to become more active.

### **2.3.2 The Transtheoretical Model**

The Transtheoretical Model (Prochaska, DiClemente & Norcross, 1992) differs from other theories of behaviour change because it includes a temporal component as a critical factor in describing and predicting behaviour (Dishman et al., 2004). The Transtheoretical Model conceptualises behaviour change as a sequential, five-stage process which includes the following steps: pre-contemplation, contemplation, preparation, action and maintenance of a particular activity (U.S. Department of Health and Human Services, 1998). According to this model, older adults' LTPA participation is influenced by their current stage of change and by their motivation to increase their level of activity.

### **2.3.3 Cohort demographics and theories of ageing**

There is a general recognition within physical activity epidemiology that demographic characteristics of the older-adult cohort, including sex, age, ethnicity, health status and income, influence LTPA participation (Dishman et al., 2004; O'Brien Cousins, 1997). While demographic characteristics are not explicit within any of the theories of behaviour change, they are frequently measured in epidemiological research as potential confounders, mediators or modifiers of behaviour (Dishman et al., 2004). Moreover, demographic characteristics are

congruent with the prevailing focus on individual-level influences on LTPA participation within epidemiological theory and research (King, 2001; Prohaska et al., 2006). Among the demographic variables that potentially influence older adults' LTPA participation, age is perhaps the most obvious factor associated with the 65 and older cohort. The influence that a person's age has on their LTPA participation can be explained by the theories of ageing, which provide insights into how the ageing process shapes the behaviours and experiences of older adults (McGuire et al., 2004).

Ageing theories which have previously been employed to explain or predict older adults' physical activity and leisure participation include *Disengagement Theory*, *Activity Theory*, *Continuity Theory* and, more recently, *Selective Optimisation with Compensation*<sup>10</sup>. *Disengagement Theory* (Cumming & Henry, 1961) argues that successful ageing involves a mutual withdrawal between an individual and the activities and roles of their earlier life. Reduced participation in LTPA is viewed as a necessary and desirable means for maintaining self-esteem in the face of physical declines (McGuire et al., 2004). Contrary to this perspective, *Activity Theory* (Burgess, 1960; Havinghurst & Albrecht, 1953) argues that successful ageing depends on an individual's capacity to maintain activities and roles, rather than disengage from them. Maintaining or increasing LTPA participation in later life is viewed as a physical, mental and social imperative for optimising wellbeing (McGuire et al., 2004). *Continuity Theory* (Atchley, 1989) purports that adults gradually develop stable patterns of activity and that, in adapting to old age, older adults attempt to preserve and maintain these patterns. *Continuity Theory* asserts that older adults' current or future LTPA participation has a direct association with their past experiences of and involvement in LTPA (Roberts, 2006). Related to the concept of continuity, is the theory of *Selective Optimisation with Compensation* (Baltes & Carstensen, 1996). According to this perspective, by focussing energy and resources on selected activities to the exclusion of others, older adults can compensate for reduced abilities and optimise feelings of continuity and competence in later life (Harahousou, 2006). In the context of LTPA, older adults would discontinue demanding activities, such as jogging, and increase involvement in a limited number of activities which were viewed as more manageable, such as walking (McGuire et al., 2004).

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<sup>10</sup> Other theories of ageing which could also provide insights into older adults' LTPA participation, but which are less commonly cited in the epidemiological and leisure literature, include *Socialisation to Old Age* (Roscow, 1974), *Age Stratification Theory* (Riley, 1971), the *Life Course Perspective* (George, 1996), *Gerodynamics* (Schroots, 1995) and *Gerotranscendence* (Tornstam, 1992).

## **2.4 The interpersonal theories of physical activity behaviour**

In addition to the intrapersonal theories which have been employed to explain older adults' LTPA participation, there are also a number of prominent interpersonal theories which recognise two levels of influence on behaviour. Interpersonal theories of behaviour change contend that participation in LTPA is influenced by individual characteristics and also by relationships and interactions with significant others. The two most commonly cited interpersonal theories of behaviour change in the epidemiological literature are the Theory of Planned Behaviour and Social Cognitive Theory.

### **2.4.1 The Theory of Planned Behaviour**

The Theory of Planned Behaviour (Ajzen, 1985) contends that the performance of an activity, such as LTPA, is the product of an individual's intention. Intention is thought to be determined by the person's motivation and attitude towards the behaviour; beliefs about what significant others think the person should do and motivation to comply with the wishes of others; and perceived feelings of control over the opportunities, resources and skills necessary to perform the behaviour (Dishman et al., 2004; U.S. Department of Health and Human Services, 1998). According to the Theory of Planned Behaviour, an older adult will have an intention to be active if they have a positive attitude toward physical activity, receive encouragement to be active from significant others and believe that they have control over the internal and external resources required to undertake the activity.

### **2.4.2 Social Cognitive Theory**

Social Cognitive Theory (Bandura, 1986) contends that behaviour, such as LTPA, is the product of the reciprocal interaction of environmental factors, individual physiological factors, thoughts and emotions, outcome expectations and an individual's belief in their capability to perform a behaviour (self-efficacy) (Weinberg & Gould, 1999). Self-efficacy is regarded as the most important aspect of Social Cognitive Theory that determines whether or not a person will be physically active. Self-efficacy is thought to be influenced by social support, role models, perceptions of coping and actual success in the execution of an activity (Dishman et al., 2004; U.S. Department of Health and Human Services, 1998). According to this perspective, an older adult will be physically active if the environment supports

participation, if they are physically capable of participating, have positive feelings towards the activity, have expectations for positive outcomes as a result of participation and, above all else, if they have high levels of belief in their own ability to participate in LTPA. Social Cognitive Theory stands out among the theories of behaviour change because, as well as acknowledging intrapersonal and interpersonal influences on behaviour, it contends that environmental factors influence LTPA participation. The influence of environmental factors, however, is not at the crux of the Social Cognitive Theory, which focuses most attention on the intrapersonal and interpersonal influences of social support, outcome expectations and self-efficacy.

## **2.5 Individual-level determinants of older adults' LTPA**

The intrapersonal and interpersonal theories of behaviour change have guided much of the epidemiological research into the determinants of older adults' LTPA participation since investigations began in the 1980s (Kaczynski & Henderson, 2007; U.S. Department of Health and Human Services, 1998). As a consequence of the prevailing focus on individual-level influences on behaviour, the epidemiological research findings are replete with intrapersonal and interpersonal determinants of older adults' LTPA participation.

Intrapersonal influences on LTPA participation have been reported more than any other in the physical activity epidemiology literature. Commonly reported intrapersonal determinants of older adults' LTPA include sex (older men tend to be more active than older women), age (younger people tend to be more active than older people), educational attainment and income (people with high levels of education and income tend to be more active than people with low levels of education and income), health status and functional ability (individuals who are in good health tend to be more active than individuals who suffer illness or disability), smoking status (nonsmokers tend to be more active than smokers), dietary habits (individuals who have a healthful diet tend to be more active than individuals who have a poor diet), early-life experiences of physical activity (individuals who have a history of LTPA participation are more likely to be active than those who have no such history), psychological distress (individuals who have good mental health tend to be more active than those who have mental health problems), self-efficacy (individuals with high self-efficacy tend to be more active than individuals with low self-efficacy), interest and motivation (individuals who have high interest and motivation tend to participate in LTPA

more often than individuals who have low interest and motivation), knowledge of the benefits of LTPA (individuals with high levels of knowledge about the benefits of LTPA are more likely to be active than those who have low levels of knowledge) and outcome expectations (people who have positive outcome expectations are more likely to be active than individuals who have negative outcome expectations) (Booth et al., 2000; Caserta & Gillet, 1998; Conn, Burks, Pomeroy, Ulbrich & Cochran, 2003; Crombie et al., 2004; Galgali et al., 1998; Grant et al., 2007; Kaplan, Newsom, McFarland & Lu, 2001; King, 2001; Lian, Gan, Pin, Wee & Ye, 1999; Lim & Taylor, 2005; O'Clark, 1999; Schutzer & Graves, 2004).

Interpersonal influences on older adults LTPA have also frequently been reported in the epidemiological literature, but to a lesser extent than the intrapersonal influences. Interpersonal determinants of older adults' LTPA include level of support and encouragement from family and friends (people who receive high levels of support and encouragement from family and friends tend to be more active than people who do not receive such support), number of family members and friends who are physically active (individuals who have many family members and friends who are active tend to be more active than individuals who have few active family members or friends), the availability of an activity partner or group (people who have an activity partner or group available tend to be more active than those who do not), advice to be physically active from a physician (people who receive a physicians written or verbal advice to be more active tend to be more active than people who do not receive such advice) and monitoring by a health professional (individuals whose LTPA participation is monitored by a health professional tend to be more active than individuals who receive no such monitoring) (Booth et al., 2000; Cohen-Mansfield, Marx, Biddison & Guralnik, 2004; Crombie et al., 2004; Kaplan et al., 2001; Lian et al., 1999; McAuley, Jerome, Elavsky, Marquez & Ramsey, 2003; Schutzer & Graves, 2004).

## **2.6 Merits and problems of individual-level theory and research**

The existing epidemiological theory and research suggests that “who you are” and “who you know” are the most important determinants of older adults' LTPA participation. The intrapersonal and interpersonal theories of behaviour change and the associated research findings have guided many of the interventions and strategies which have been aimed at increasing LTPA participation (U.S. Department of Health and Human Services, 1998). In New Zealand, the “Green Prescription” programme, which is based on a health professionals

advice to be active, and the “Push Play” campaign, a nationwide promotion to increase knowledge about the benefits of activity and inform people how to become more active, are examples of strategies that have been developed on the basis of the individual-level theory and research (Sport and Recreation New Zealand, 2005). Preliminary research findings have found that these strategies have led to moderate increases in physical activity participation among middle-aged and older adults (Elley, Kerse, Arroll & Robinson, 2003), which suggests that intrapersonal and interpersonal factors influence older adults’ LTPA participation.

Although the epidemiological research has identified many intrapersonal and interpersonal influences on older adults’ LTPA participation, these variables, in actuality, only account for a small proportion of the total variance in LTPA behaviour among older adults (King et al., 2002). Furthermore, it has been argued that most interventions designed to increase LTPA which have been based on intrapersonal and interpersonal theory and research have failed to significantly increase the numbers of older adults who are regularly active (Giles-Corti, Timperio, Bull & Pikora, 2005). Focussing only on individual-level influences represents a form of reductionism in which the complex phenomenon of LTPA participation is explained on the basis of a narrow range of intrapersonal and interpersonal variables (Babbie, 2004). Critics of individual-level theory and research have also argued that focussing predominately on the intrapersonal and interpersonal determinants of LTPA ignores or downplays the influence of environmental factors (McLeroy et al., 1988; Prohaska et al., 2006). There is, however, a growing body of evidence which suggests that “where you live” also influences LTPA behaviour (Humpel, Owen & Leslie, 2002).

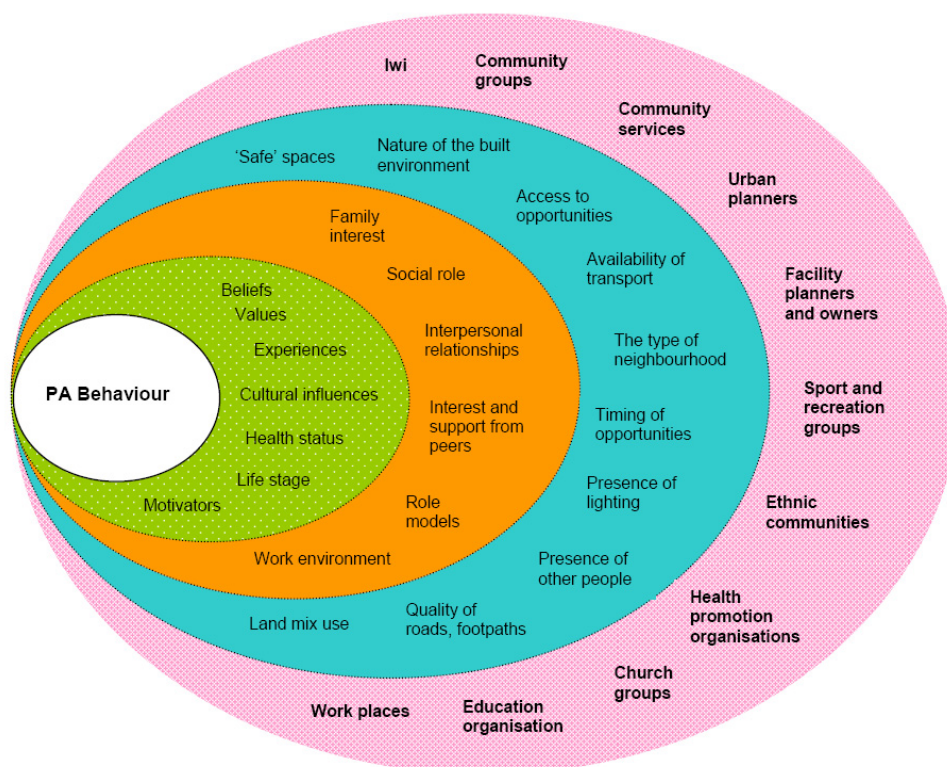
Environmental factors are among the least studied determinants of older adults’ LTPA, yet they potentially have a substantial influence on participation (King, 2001). The theoretical foundation for research into the environmental influences on older adults’ LTPA participation is ecological theory.

## **2.7 Ecological theories of physical activity behaviour**

Ecological theories of behaviour change (McLeroy et al., 1988; Stokols, 1992) acknowledge the intrapersonal and interpersonal influences on behaviour, but focus most attention on the role played by the environment. In recognising three levels of influence on behaviour, ecological theories are also the most comprehensive of the theories of behaviour

change (Satariano & McAuley, 2003). The general thesis of ecological theories is that environmental factors influence individual behaviours by promoting and sometimes demanding certain actions while discouraging or restricting others (Sallis et al., 1998; Stokols, 1992). Environments that influence behaviour include the physical environment, the social environment, the policy environment, and the institutional and organisational environments (McLeroy et al., 1988). Multiple facets of the physical and social environment, in particular, are thought to be an important influence on health behaviours, such as LTPA (Stokols, 1992). This can be seen in the following ecological model of physical activity behaviour.

Figure 2: An ecological model depicting the influences on physical activity

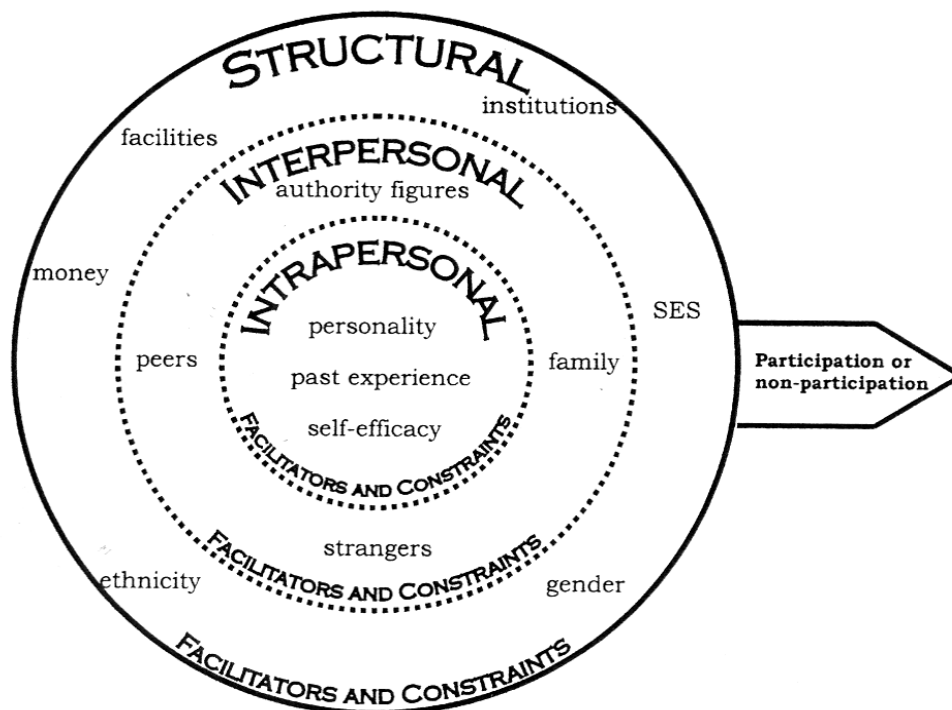


(Sport and Recreation New Zealand, 2005, p. 11)

Following ecological theory, it has been argued that environments rich in resources relevant for physical activity, such as footpaths, parks, and health clubs, make it easier for people to be physically active; while environments that lack resources or pose barriers, such as high crime rates, may reduce the probability that people will be physically active (Sallis, Johnson, Calfas, Caparosa & Nicols, 1997). Adherents of the ecological perspective have argued that environmental attributes are at least, if not more, important than intrapersonal and interpersonal influences on LTPA because they influence large numbers of people and are potentially more amenable to change than individual attributes, cognitions and relationships (McLeroy et al., 1988; Sallis et al., 1998).

Ecological theories of behaviour change are also a feature of the leisure studies paradigm. There is a body of research within this paradigm which is concerned with leisure constraints and facilitators, wherein the environment is conceptualised as a significant influence on leisure participation (Crawford et al., 1991; Raymore, 2002). Raymore (2002) has proposed an ecological model of leisure participation which incorporates intrapersonal, interpersonal and environmental (structural) influences on behaviour. Raymore (2002) has argued that people live in environments that both facilitate and constrain leisure participation and also that both the facilitators and constraints must be accounted for when discussing participation or non participation from an ecological perspective.

Figure 3: An ecological model of leisure participation



(Raymore, 2002, p. 43)

Physical activity epidemiology and leisure studies have begun to conceptualise LTPA participation as the product of multiple levels of influence on behaviour. Significantly, researchers from both paradigms have recognised that, in addition to the intrapersonal and interpersonal influences on behaviour, environmental or structural factors also play a role in determining whether or not a person participates in LTPA. The ecological perspective is becoming an increasingly relevant framework for conceptualising the influences on LTPA participation, and ecological theories of behaviour change form the theoretical basis for investigations into the influence of the neighbourhood environment and neighbourhood deprivation on older adults' LTPA participation.



## 2.8 Neighbourhood influences on older adults' LTPA

Following an ecological perspective, researchers have recently begun to explore the neighbourhood influences on older adults' LTPA participation. A number of studies have been undertaken with the broad purpose of identifying potential environmental influences on older adults LTPA which either constrain or facilitate participation and may influence the development of disease and disability in later life. Notable studies have been conducted by Booth et al. (2000), Li et al. (2005) and Michael et al. (2006).

Booth et al. (2000) explored the perceived environmental influences associated with the physical activity participation of older Australians. They used a cross-sectional interview survey to collect demographic information, perceived environmental influences on physical activity and self-reported physical activity participation, from a random sample of 449 adults aged 60 and older. After controlling for the influence of demographic confounders, multivariate analysis found that safe footpaths for walking and accessible local recreation facilities were associated with increased LTPA participation among the older adult sample.

More recently, Li et al. (2005) investigated the relationship between built environment factors and walking behaviour among older adult residents of Portland, USA. A cross-sectional survey collected demographic information, perceptions of the neighbourhood and self-reported walking behaviour, from a random sample of 577 adults aged 65 and older. Characteristics of the built environment were also objectively measured using geographic mapping software. After controlling for confounding demographic variables, multivariate analysis identified that the following neighbourhood characteristics were associated with more frequent neighbourhood walking: high density of housing and shops, the presence of green and open spaces, close proximity to recreational facilities and perceived safety from traffic.

Michael et al. (2006) explored how neighbourhood design encouraged or inhibited physical activity in general and walking in particular among older adult residents of Portland, USA. During nine focus group sessions, 60 respondents aged 55 and older discussed the features of their neighbourhood that they liked and disliked in relation to their physical activity participation. Analysis of focus group transcripts identified the following themes: local shops and services provided older adults with places to walk, to meet others and to stay

active without the need for a car; concerns about traffic and inadequate pedestrian infrastructure limited walking and other physical activities in neighbourhoods by making older adults feel unsafe; and a neighbourhood's sense of attractiveness encouraged walking for exercise and pleasure.

These three studies supported the tenets of ecological theory by confirming that aspects of the neighbourhood environment, particularly the physical environment, influenced the LTPA participation of older adults. Neighbourhood factors which were found to be associated with older adults LTPA participation included safe walking amenities, proximal recreation facilities, high density of housing and shops, the presence of green and open spaces and neighbourhood attractiveness (Booth et al., 2000; Li et al., 2005; Michael et al., 2006).

While the studies presented above revealed the possible influence of neighbourhood characteristics on older adults' LTPA participation, they did not highlight differences between neighbourhoods. It is likely, however, that certain neighbourhoods contain fewer favourable physical and social environmental conditions than others, making them less conducive to LTPA participation (Haywood et al., 1995). Relatively few studies have explored how neighbourhood deprivation, as a particular arrangement of physical and social conditions, influences older adults' LTPA participation (Satariano & McAuley, 2003).

## **2.9 The influence of neighbourhood deprivation**

Investigations into the influence of neighbourhood deprivation on LTPA derive from the epidemiological tradition of investigating "neighbourhood effects" on health (Pickett & Pearl, 2001). In the late 1980s and early 1990s, epidemiological researchers found evidence that living in a high-deprivation neighbourhood was associated with worse functioning and poorer health among the general adult population (Haan et al., 1987; Macintyre et al., 1993). These findings prompted researchers to investigate how neighbourhood deprivation affected the health of population subgroups, such as older adults. A number of researchers have recently demonstrated that living in a neighbourhood with more physical and social problems is associated with poorer health and worse functioning among older adult residents (Balfour & Kaplan, 2002; Breeze et al., 2005).

Balfour and Kaplan (2002) explored the association between poor-quality neighbourhoods and the loss of physical function among older adult residents of Alameda County, USA. The researchers used a longitudinal survey, conducted in 1994 and 1995, to collect data about the severity of perceived neighbourhood problems and difficulties performing everyday physical tasks from 883 adults aged 55 and older. Balfour and Kaplan found that older adult residents of poor-quality neighbourhoods had a greater risk of functional deterioration over one year compared to those who lived in more affluent neighbourhoods. Neighbourhood factors that were found to be associated with reduced physical functioning included excessive noise, inadequate lighting and heavy traffic.

Breeze et al. (2005) investigated how neighbourhood deprivation contributed to health-related quality of life for older adults in Britain. The researchers employed a cross-sectional survey to measure the self-reported health status, self-care, home management, mobility, social interaction and morale of 5,581 individuals aged 75 and older. In agreement with Balfour and Kaplan's (2002) findings, Breeze et al. found that older adults who were living in the most deprived neighbourhoods were significantly more likely to have poor, health-related quality of life than those who were living in the most affluent areas.

In their conclusions, both Balfour and Kaplan (2002) and Breeze et al. (2005) surmised that the reduced functioning and poor health associated with residing in a more deprived neighbourhood may have resulted from reduced participation in health behaviours, such as physical activity. In spite of these conclusions, however, the present researcher is aware of no studies which have investigated the influence of neighbourhood deprivation on older adults' LTPA. To date, the only studies which have investigated the influence of neighbourhood deprivation on LTPA participation have been undertaken in the context of the general-adult population. Prominent studies were undertaken by Yen and Kaplan (1998), Giles-Corti and Donovan (2002b), and van Lenthe, Brug and Mackenbach (2005).

Yen and Kaplan (1998) investigated whether residence in a government-designated "poverty area" was associated with reduced levels of physical activity among adult residents of Alameda County, USA. A longitudinal survey, conducted in 1965 and 1974, collected demographic information and data about frequency of LTPA participation from 1,737 adult residents of poverty and nonpoverty neighbourhoods. After controlling for demographic confounders, multiple regression analysis revealed that residents of the poorest neighbourhoods participated in significantly less LTPA than residents of more affluent

neighbourhoods. Yen and Kaplan's research was among the first to highlight neighbourhood differences in LTPA participation.

More recently, Giles-Corti and Donovan (2002b) examined socioeconomic status differences in recreational physical activity levels and real and perceived access to a supportive physical environment among adult residents of Perth, Australia. A cross-sectional survey collected demographic information, perceptions of the neighbourhood environment, perceived access to neighbourhood facilities and physical activity behaviour from 1,803 adults living in high- and low-socioeconomic status neighbourhoods. Spatial access to recreational facilities was measured using geographical mapping software. After controlling for potential confounding from demographic variables, multivariate analysis demonstrated that respondents in low-socioeconomic neighbourhoods were less physically active in their recreation and less active overall than those living in high-socioeconomic areas. Neighbourhood factors which were found to be associated with LTPA participation included perceived access to footpaths, neighbourhood attractiveness and spatial access to attractive, public, open space.

Similar results were also found in the Netherlands by van Lenthe et al. (2005) who investigated the association between the neighbourhood socioeconomic environment and physical inactivity. A cross-sectional survey was used to measure the neighbourhood socioeconomic environment, the physical and social characteristics of the neighbourhood, and aspects of physical activity participation among 8,767 adults in 78 diverse neighbourhoods. After controlling for confounding from demographic variables, multivariate analysis found that residents of the most deprived neighbourhoods participated in less LTPA and less overall physical activity than residents of the least deprived neighbourhoods. Poorer physical neighbourhood design and higher levels of required police attention were found to be associated with lower levels of physical activity in deprived neighbourhoods. Significantly, this was one of the only neighbourhood effects studies to report that aspects of the social environment influenced LTPA participation.

The existing literature suggests that neighbourhood deprivation is associated with worse health and functioning among older adults and lower levels of LTPA among the general-adult population. It seems probable that the findings that neighbourhood deprivation influences adults' LTPA participation could be replicated among older adults. Neighbourhood factors that were found to be associated with older adults' health and functioning and adults' LTPA

participation included access to recreational facilities, access to safe pedestrian infrastructure, neighbourhood attractiveness and design, the level or required police attention, noise, street lighting and traffic.

## **2.10 The problems and merits of neighbourhood research**

Early evidence suggests that neighbourhood characteristics have an influence on older adults' LTPA and that high neighbourhood deprivation, as a set of potentially deleterious physical and social conditions, may constrain participation. There are, however, a number of uncertainties associated with the existing neighbourhood research. These uncertainties relate to suggestions that environmental influences may be less important than intrapersonal and interpersonal influences, that neighbourhood deprivation may not actually be associated with reduced LTPA participation, and that it is difficult to accurately identify true environmental influences on LTPA.

Although the epidemiological research suggests that neighbourhood environment and neighbourhood deprivation may influence LTPA participation among the general- and older-adult populations, there is also evidence to suggest that the influence of neighbourhood may be overstated and less significant than intrapersonal and interpersonal influences. In a study which investigated the relative influence of individual, social and environmental determinants of physical activity among a sample of adult Australians, Giles-Corti and Donovan (2002a) found that intrapersonal and interpersonal factors appeared to be better predictors of physical activity participation than environmental factors. In addition to this, a recent analysis of the barriers to older adults' physical activity participation in New Zealand, which included measures of environmental barriers, revealed that intrapersonal factors were the most prevalent determinants of participation (Grant et al., 2007). These findings raise doubts about the relative importance of the neighbourhood environment.

It has also been argued that the influence of neighbourhood deprivation on LTPA participation may be less significant than first thought. Macintyre (2007) has argued that it may not always be true that poorer neighbourhoods are exposed to deleterious environmental conditions which conspire to reduce participation in health behaviours, such as LTPA. As an example of this, a recent New Zealand study found that spatial access to a range of health-promoting community resources, including those associated with LTPA, was actually better in

more deprived neighbourhoods (Pearce, Witten, Hiscock & Blakely, 2007). Pearce et al. (2007, p. 348) concluded that,

These results challenge the widely held, but largely untested, view that areas of high social disadvantage have poorer access to community resources. Poor locational access to community resources among deprived neighbourhoods in New Zealand does not appear to be an explanation for poorer health in these neighbourhoods.

In addition to the uncertainties relating to the relative influence of neighbourhood on LTPA participation, there are also issues associated with accurately identifying environmental influences on behaviour and separating contextual influences on behaviour from compositional ones. The environment has previously been described as a “black box of mystical influence” which contains literally thousands of possible influences on LTPA behaviour (Ball, Timperio & Crawford, 2006; Macintyre et al., 2002). It can, therefore, be extraordinarily difficult to be certain which environmental factors are the true influences on LTPA behaviour, for investigations into the influence of neighbourhood environment on LTPA may be complicated by confounding from a myriad of unmeasured environmental variables (Ball et al., 2006). Moreover, it can also be difficult to determine whether environmental influences on LTPA are the result of neighbourhood characteristics or compositional attributes of the resident population. It is possible that people may be sorted into neighbourhoods based on their personal characteristics and these personal characteristics may be related to LTPA behaviour (Diez-Roux, 2001). Thus, it is possible that supposed neighbourhood influences on LTPA may, in fact, be the result of the personal attributes of the population under investigation.

Although there is some uncertainty about the specific nature and precise mechanisms of neighbourhood influences on LTPA, there is a wide consensus among epidemiological researchers that where you live does, in fact, influence participation in a range of health behaviours, including LTPA. It has been only in the last 10 years that physical activity epidemiologists have begun to seriously consider the neighbourhood environment and neighbourhood deprivation as credible influences on LTPA behaviour and this area of research is described as being in its infancy (Ball et al., 2006). It is not surprising then, that the strength of evidence for neighbourhood effects on older adults’ LTPA participation is still somewhat inconclusive. More research is needed in this area to verify and extend the small number of existing research findings. Neighbourhood effects research has opened up a new level of possible influence on behaviour which may ultimately increase understanding about

the determinants of older adults' LTPA and provide pathways for increasing participation in this health-promoting behaviour.

## **2.11 Limitations and gaps in the previous research**

There are a number of limitations and gaps associated with the epidemiological studies which have investigated neighbourhood influences on older adults' LTPA. These limitations and gaps raise questions about the strength of the existing research findings and provide impetus for the present research investigation into how neighbourhood deprivation influences older adults' LTPA participation. Significant limitations relate to the lack of a standard definition of the older-adult cohort, research being undertaken in relatively homogenous areas and an over-reliance on researcher-designed surveys. Notable gaps in the epidemiological research relate to a lack of focus on the environmental determinants of older adults' LTPA, a lack of qualitative and mixed-methods approaches, and a lack of inclusive neighbourhood definitions. The limitations of the research literature are discussed first, followed by a consideration of the gaps.

Among the research studies which have investigated older adults' LTPA participation and the influence of neighbourhood deprivation on health, there have been discrepancies in definitions of the older-adult cohort. Definitions of older adults reported in the literature include 55 years and older (Michael et al., 2006), 60 years and older (Booth et al., 2000), 65 years and older (Li et al., 2005) and 75 years and older (Breeze et al., 2005). These definitional discrepancies make it difficult to draw firm conclusions about the influence of neighbourhood factors on older adults' LTPA participation across the body of literature. The lack of a standard definition of the older-adult cohort also reduces the extent to which these research findings can be applied to health-related legislation and policy.

A number of the research studies presented in this literature review (Giles-Corti & Donovan, 2002a, 2002b; Li et al., 2005; Michael et al., 2006) were undertaken in relatively homogenous areas which are known for their comparative egalitarianism and well-managed urban environments, such as Perth, Australia, and Portland, USA. These cities, however, may lack the contrasts in neighbourhood conditions and deprivation which are necessary for a comprehensive investigation into the neighbourhood influences on LTPA. It is likely that the

results derived from these studies significantly understated or misconstrued the influence of the neighbourhood environment.

Research into the influences on older adults' LTPA participation have typically employed researcher-constructed surveys which have been composed of only a limited number of variables which are thought to influence LTPA behaviour (Balfour & Kaplan, 2002; Giles-Corti & Donovan, 2002b). Relying exclusively on a researcher-constructed survey, however, biases potential responses towards a narrow selection of choices deemed to be significant by the researcher. The use of a researcher-defined survey, as the sole research instrument, may omit potentially significant, but unmeasured, influences on LTPA.

In addition to the above limitations, the existing research is also constrained by the use of cross-sectional research designs and the use of self-reported LTPA behaviour. These limitations are discussed in Chapters Three and Five, when the limitations of the current study are being considered. The gaps in the existing literature are now presented.

There is general lack of research into the environmental determinants of older adults' LTPA, both internationally and in New Zealand (Gee & Davey, 2002; Humpel et al., 2002; Ministry of Social Development, 2005). Furthermore, while a handful of studies have investigated the environmental determinants of older adults' LTPA (Michael et al., 2006) and others have explored the influence of neighbourhood deprivation on LTPA among the general-adult population (Giles-Corti & Donovan, 2002b), the present researcher is aware of no studies which have combined these two areas of investigation to explore the influence of neighbourhood deprivation on older adults' LTPA participation.

With the exception of Michael et al. (2006), there have been few qualitative or mixed-methods investigations into older adults' LTPA participation. Such approaches, however, are likely to be invaluable for developing a more comprehensive and in-depth understanding of how neighbourhood conditions affect older adults' LTPA participation. A number of epidemiological researchers have called for the increased use of qualitative, mixed-method and other innovative research approaches to study the environmental influences on older adults' LTPA participation (Diez-Roux, 2001; Satariano & McAuley, 2003).

Most studies which have explored the influence of neighbourhood factors on LTPA have used administrative units, such as area units or postal codes, as proxies for residential



neighbourhoods (Balfour & Kaplan, 2002; Giles-Corti & Donovan, 2002b; Li et al., 2005). Such distinctions, however, may not coincide with individuals' subjective perceptions of neighbourhood and may omit significant environmental attributes which are located outside the arbitrary administrative boundaries (Breeze et al., 2005). Few studies have attempted to create meaningful and inclusive neighbourhood definitions which are relevant to all respondents.

## **2.12 Chapter summary**

The majority of the theory and research which has investigated the influences on older adults' LTPA participation has been conducted within the physical activity epidemiology paradigm and based on arguments for health promotion and disease prevention (Dishman et al., 2004). Within this paradigm, a number of theoretical perspectives have been employed to explain and predict older adults' LTPA participation, including the Health Belief Model, the Transtheoretical Model, cohort demographics and the theories of ageing, the Theory of Planned Behaviour and Social Cognitive Theory. The overwhelming focus of epidemiological theory and research has been on intrapersonal and interpersonal influences on older adults' LTPA and many individual-level influences on older adults' LTPA participation have been identified as a result. This focus, however, has ignored or downplayed the potentially important influence of the environment on LTPA behaviour. Ecological theories of behaviour change acknowledge that the environments in which people live may constrain or facilitate behaviours, such as LTPA participation (Sallis et al., 1998; Stokols, 1992). Following an ecological approach, recent epidemiological studies have demonstrated that the neighbourhood environment appears to influence older adults' participation in LTPA (Li et al., 2005; Michael et al., 2006). Recent research has also found that physical and social attributes of high-deprivation neighbourhoods, in particular, are associated with reduced participation in LTPA among adults (Giles-Corti & Donovan, 2002b; van Lenthe et al., 2005). While there is some debate about the specific nature and precise mechanisms of environmental influences on LTPA, the preliminary evidence for neighbourhood influences on older adults' LTPA is compelling and requires verification.

This literature review has provided an overview of the theory and research that is concerned with identifying the influences on older adults' LTPA. It has focussed most attention on the ecological theory of behaviour change and the neighbourhood determinants of

older adults' LTPA participation, including the determinants associated with neighbourhood deprivation. This literature review also identified a number of limitations and gaps in the current neighbourhood effects literature which this study will attempt to address in the following chapter. This literature review, however, has not been exhaustive and has only briefly touched on other potentially important perspectives, such as the theories of ageing and theories of leisure constraints and facilitators, which may be integral to a complete understanding of how neighbourhood deprivation influences older adults' LTPA participation. In the next chapter, the methods of enquiry employed in the current study are outlined and discussed.

# Chapter Three: Methods

## 3.1 Chapter introduction

This chapter provides an overview of the methods that were employed in this research to investigate how neighbourhood deprivation influences older adults' leisure time physical activity (LTPA) participation. Firstly, the pilot test, which preceded the research, is described. Secondly, an explanation is given for the selection and definition of the neighbourhoods under investigation, and pertinent characteristics of the neighbourhoods are presented. Thirdly, the selection and recruitment of the older adult sample groups are discussed<sup>11</sup>. Next, the overall research design is outlined and the rationale for the particular approach is discussed. Then, the methods of enquiry used in this research (recall survey, Q method and semi-structured interviewing) are outlined, covering description, general limitations and application. Finally, the methods of data analysis are presented to provide a context for the results in Chapter Four.

## 3.2 Pilot testing

In May 2007, the research instrument was pilot tested with four males and three females aged from 51 to 80 years who were living in urban Christchurch. The research instrument was composed of a mixture of quantitative and qualitative methods, including a recall survey, Q method with photographs and semi-structured interviewing. Pilot testing was conducted to check for errors and ambiguities within the research instrument and to determine the duration of the interviews. As a result of pilot testing, minor changes were made to the procedures with particular focus on making them more compatible with the target population of this research: older adult New Zealanders.

## 3.3 Selection and definition of neighbourhoods

To understand how neighbourhood deprivation influences older adults' participation in LTPA, a comparison was made of two distinct neighbourhoods in urban Christchurch. The neighbourhoods were selected based on their contrasting positions on the New Zealand

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<sup>11</sup> This research was reviewed and approved by the Lincoln University Human Ethics Committee. All participants in this research gave informed, written consent prior to their participation in the research. In the sections which follow, pseudonyms are used where participants are quoted. Pseudonyms are also used when referring to the neighbourhoods under investigation.

Deprivation Index (NZDep2001). The NZDep2001 is a small area index of socioeconomic deprivation in New Zealand which is constructed from a number of indicators<sup>12</sup> of socioeconomic status taken from the 2001 Census (Salmond & Crampton, 2002). The NZDep2001 ranges from 1 to 10. A score of 1 indicates that an area is in the least deprived 10 percent of all locations in New Zealand and a score of 10 indicates that an area is in the most deprived 10 percent of all areas in New Zealand (Salmond & Crampton, 2002). The NZDep2001 provides deprivation scores for small geographic areas in New Zealand at the mesh block<sup>13</sup> and area unit<sup>14</sup> levels (Salmond & Crampton, 2002). Deprivation data at area unit level were used for this research because area units coincide with suburban boundaries in urban Christchurch.

Deprivation index scores are a measure of the aggregated socioeconomic conditions of individuals, rather than a direct measure of social and physical characteristics of the neighbourhood environment. Such measures, however, are often used by researchers as proxies for the social and physical characteristics of the neighbourhood environment, given the obvious association between individual-level deprivation and the conditions of one's neighbourhood environment (Breeze et al., 2005; Giles-Corti & Donovan, 2002b; Macintyre et al., 1993; Yen & Kaplan, 1998). As Macintyre et al. (1993, p. 229) point out, "We all know that areas inhabited by less affluent people are less pleasant than areas inhabited by more-affluent people, and that is why the more affluent people live where they do". In this research, deprivation scores are used as a proxy measure of the quality of the physical and social environment in each neighbourhood.

An examination of the area unit deprivation scores in Christchurch identified a grouping of high-deprivation suburbs to the east of the city centre and a grouping of low-deprivation suburbs to the west. Christchurch is among the most socially stratified cities in New Zealand and is renowned as less egalitarian and more aristocratic than many other areas (Wilson & Reed, 2005). As a result of this, urban Christchurch has a number of areas of both high and low deprivation which makes the city an ideal setting for comparative research. To the east of the city centre, there was a concentration of high deprivation areas centred in the adjoining

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<sup>12</sup> The NZDep2001 is constructed from nine variables from the 2001 Census, including government benefits, unemployment, household income, access to a telephone, access to a car, household type, qualifications, home ownership and bedroom occupancy (Salmond & Crampton, 2002). The equivalent data for the 2006 Census was not available at the time this research was undertaken.

<sup>13</sup> Mesh blocks are the smallest geographical units for which Statistics New Zealand collects data, which usually contains around 90 people (Statistics New Zealand, 2006).

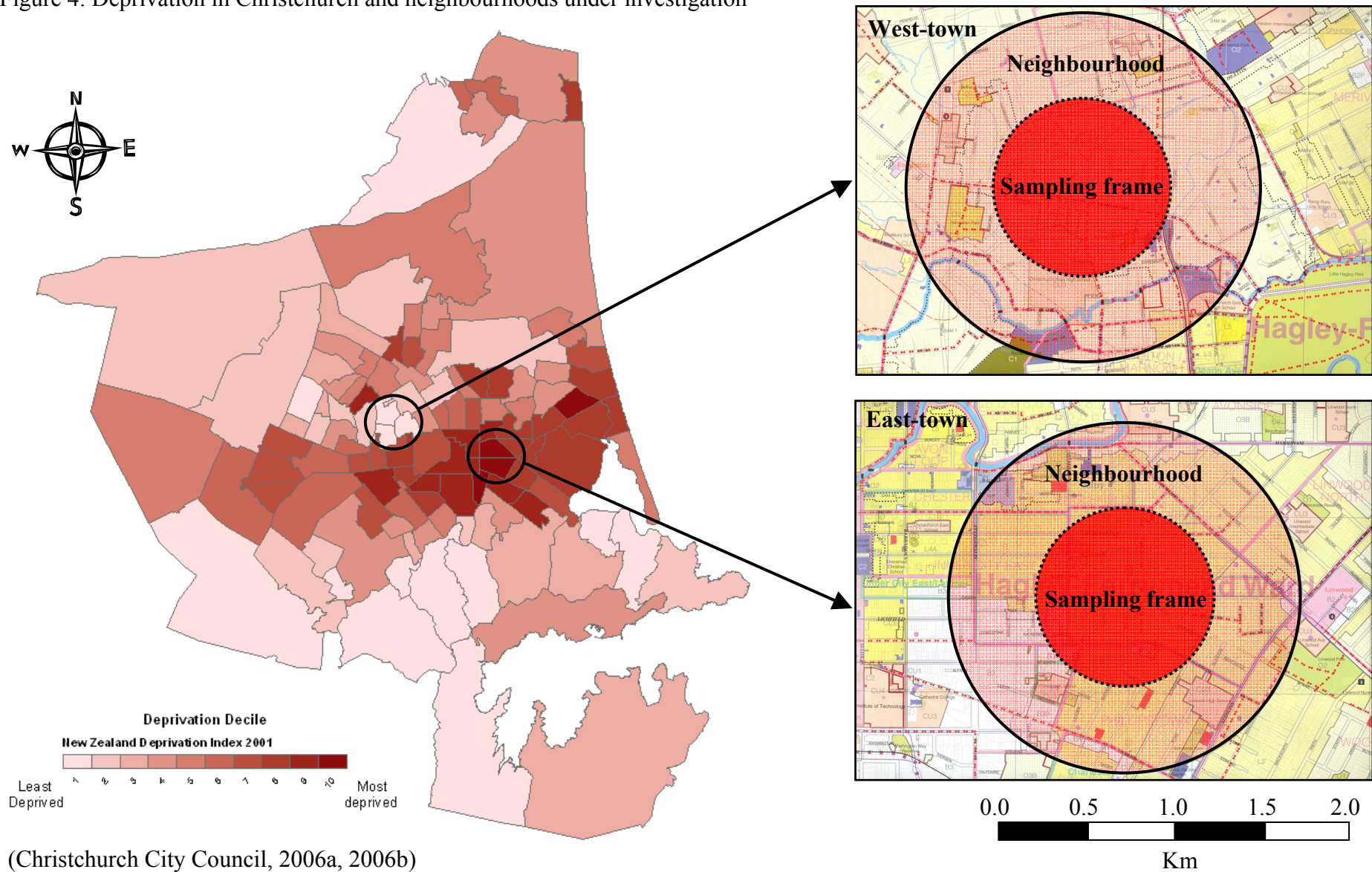
<sup>14</sup> Area units are aggregations of mesh blocks which usually contain 3,000 to 5,000 people and generally coincide with suburbs when in urban areas (Statistics New Zealand, 2006).

suburbs which, for the purposes of this research, have been called “Eastside One” and “Eastside Two”. Both of these suburbs had a score of 10 on the NZDep2001 (Ministry of Health, 2006). To the west of the city centre, there was a concentration of low deprivation centred in the adjoining suburbs of “Westside One”, “Westside Two” and “Westside Three”. Each of these suburbs had a score of one on the NZDep2001 (Ministry of Health, 2006). The two aggregations of area units established the general geographical areas for investigation and were named “East-town” (Eastside One and Eastside Two) and “West-town” (Westside One, Westside Two and Westside Three) by the researcher.

Administratively-defined neighbourhoods, represented by area units, can be problematic for researchers. Area units are poor proxies for neighbourhoods as they are often inconsistent with residents’ subjective perceptions of neighbourhood, and the irregular and arbitrary boundaries of area units may result in important characteristics being excluded from research definitions of neighbourhood (Ball et al., 2006). Thus, a more inclusive definition of neighbourhood was needed to take in all of the relevant neighbourhood features for residents of East-town and West-town. In order to render these groupings of high and low deprivation into more suitable neighbourhood proxies, which could address the problems associated with area units, a distance-based definition of neighbourhood was employed. Neighbourhood was defined as a fixed distance from a resident’s home.

Defining neighbourhood as a given distance from an individual’s home has been employed in previous studies which have investigated neighbourhood influences on physical activity and health, but there has been little agreement on the most appropriate distance, which ranges from around 400 to 1,000 metres (Ball et al., 2006; Giles-Corti et al., 2005). In this research, a 1,000-metre radius was selected for the neighbourhood boundary as this distance was sufficiently large to enclose each grouping of suburbs and to take in neighbourhood features that were located just outside the irregular area unit boundaries. On a recent map of urban Christchurch, a circle with a 1,000-metre radius was drawn from the centre of each grouping of high- and low-deprivation suburbs (see Figure 4). This circle represented the neighbourhood boundary. A smaller circle with a 500-metre radius was drawn in the centre of each neighbourhood. This smaller, inner circle represented the sampling frame for each neighbourhood. The rationale for the central sampling frame was to ensure that individuals selected for the study would, for the most part, relate to the researcher-designated area as their neighbourhood and that none of the respondents would be located on the neighbourhood boundary.

Figure 4: Deprivation in Christchurch and neighbourhoods under investigation



(Christchurch City Council, 2006a, 2006b)

## **3.4 Characteristics of the neighbourhoods**

### **3.4.1 East-town**

East-town is a medium-density residential neighbourhood that is bordered to the south-west by a large industrial area (Christchurch City Council, 2006a). East-town has traditionally been comprised of working-class individuals and is known as a less affluent part of Christchurch (Christchurch City Council, 2006a). East-town has a lower median individual income and lower levels of educational attainment than most other parts of Christchurch (Statistics New Zealand, 2007). East-town has a smaller population of older adults than many other parts of Christchurch, comprising approximately nine percent of the neighbourhood population (Statistics New Zealand, 2007).

### **3.4.2 West-town**

West-town is a low-density residential neighbourhood that contains many historically significant buildings, parks and gardens (Christchurch City Council, 2006b). West-town has traditionally been comprised of urban professionals and wealthy landowners and is known as a more affluent part of Christchurch (Christchurch City Council, 2006b). West-town has a higher median individual income and higher levels of educational attainment than most other parts of Christchurch (Statistics New Zealand, 2007). West-town has a higher proportion of older adults than other parts of Christchurch, comprising approximately 15 percent of the neighbourhood population (Statistics New Zealand, 2007).

### **3.4.3 Neighbourhood leisure provision**

The East-town and West-town neighbourhoods have a similar number of publicly-accessible neighbourhood leisure resources, such as parks, community halls and tennis courts (see Table 1). However, this does not account for the size, quality or accessibility of such facilities or the probability that residents of the affluent West-town neighbourhood may also have access to private leisure resources, such as swimming pools and large gardens. Of additional interest, and potentially relevant to LTPA participation, the West-town neighbourhood has 28 heritage and historic places compared to just 11 such locations in East-town (Christchurch City Council, 2006a, 2006b).

Table 1: Publicly accessible leisure provision in East-town and West-town

<b>Leisure provision</b>	<b>East-town</b>	<b>West-town</b>
Parks	8	8
Sport/recreational clubrooms	3	1
Sport surfaces (bowling greens, tennis courts etc.)	3	6
Halls (community, school, church)	6	6
Gyms/Health clubs	1	0
Swimming pools	1	0
<b>Total</b>	<b>22</b>	<b>21</b>

(Christchurch City Council, 2006a, 2006b, 2007a, 2007b)

### 3.5 Selection and recruitment of participants

A relatively representative sample of the older-adult population living within the East-town and West-town neighbourhoods was obtained by random selection. The method of random selection employed in this research was systematic sampling. In systematic sampling, every  $k$ th element from a total population is selected for inclusion in the sample (Babbie, 2004). Systematic sampling was employed in this research because the exact number and location of older adults within each neighbourhood was unknown and because contact information for older residents was not readily available. Systematic sampling was also used to provide a random sample, which is a necessity for studies involving quantitative survey research. In accordance with a systematic sampling procedure, every second house within the sampling frame was approached until a sample of at least 30 older adults had been obtained from East-town and West-town, resulting in a total sample size of around 60. A neighbourhood sample size of 30 is at the lower end of what is generally considered acceptable for statistical analysis; however, it is sufficient to provide a basic description of the study population and rudimentary comparison between neighbourhoods (Singleton & Straits, 1999). This sample size is also sufficient given the mixed-methods approach used in this research, which incorporated both qualitative and quantitative measures. The selection of respondents from each neighbourhood was conducted on alternate days to control for the adverse influence of wintertime weather, and an acquaintance of the researcher randomly chose the order of streets to be visited to avoid oversampling individuals from a particular locality within each neighbourhood.

Recruitment of the research participants was undertaken as follows. The researcher visited every second house on randomly-selected streets within the sampling frame of both the East-town and West-town neighbourhoods. When an older adult resident was encountered, the researcher introduced himself and his credentials. He explained the purpose and nature of his



research and the reason for the older adult's selection. He then provided an information letter, summarising the research objectives and the role of the study participants, and asked for the older adult's participation in the research. If the potential respondent indicated that they would like to participate, a consent form was left with them and a convenient time was arranged to return to conduct the research and collect the consent form. Over the four-week data collection period, during June 2007, approximately 90 older adults were approached by the researcher. Sixty-three older adults, including 31 East-town residents and 32 West-town residents, agreed to participate in the research, resulting in a response rate of around 70 percent. Reasons for nonparticipation given by some of the older adults who were approached by the researcher included no interest in taking part in the research or a perceived lack of knowledge about the research topic.

### **3.6 Research design**

This study is characterised by cross-sectional, comparative and mixed-methods design elements. It does not follow a particular paradigm, but represents a pragmatic approach to addressing the research problem. A pragmatic approach is the basis for mixed-methods research and methods of enquiry are selected solely for their perceived ability to increase understanding of the research problem (Creswell, 2003). The three main characteristics of the research design are now discussed in turn.

Cross-sectional studies are based on observations representing a single point in time (Babbie, 2004). The benefit of cross-sectional research is that it permits the one-time collection of data from many different people or groups, facilitating an expeditious research outcome (Lewis-Beck, Bryman & Futing, 2004). Cross-sectional research, however, reveals only a snapshot of a research problem and cannot determine causality (Babbie, 2004). Thus, it could not be claimed from this research that "x" neighbourhood characteristic caused "y" outcome. Instead, it could be implied that there appeared to be an association between x and y which warrants further investigation. In recognition of the limitations of cross-sectional studies, the current research refers to *influences* on LTPA participation, rather than *causes*.

Comparative research provides an analytical framework for researchers to examine and explain similarities and differences between social entities, such as neighbourhoods (Lewis-Beck et al., 2004). By comparing social groups, researchers might identify inequities which

have significant social ramifications. For example, disparities in LTPA participation between residents of high- and low-deprivation neighbourhoods may predispose those living in the most deprived neighbourhood to disease and disability associated with inactivity. A potential difficulty associated with comparative research arises when the social entities to be compared are extremely different (Lewis-Beck et al., 2004). This is unlikely to be an issue in this research, however, as the two sample groups are comparable in terms of age, cultural background and city of residence.

Mixed-methods research collects and analyses both quantitative and qualitative data within a single study to investigate a research question (Creswell, 2003; Lewis-Beck et al., 2004). The rationale for using mixed-methods is that most social research is based on results derived from a single method and, as such, is vulnerable to the accusation that the findings may lead to incorrect inferences and conclusions if measurement error is present (Lewis-Beck et al., 2004). The benefit of mixed-methods research is that it provides a means of triangulating data sources<sup>15</sup>, reducing biases and errors inherent in any single method and providing insight into different aspects of the research problem (Creswell, 2003; Singleton & Straits, 1999). In this research, mixed-methods were employed primarily in anticipation of some of the inherent difficulties associated with studying the effect of neighbourhood deprivation on older adults' LTPA. These difficulties include the multitude of possible confounding influences on physical activity, the numerous dimensions of the neighbourhood environment and a lack of guiding literature relating to the most appropriate methods for investigating neighbourhood influences on physical activity.

Mixed-methods research can, however, also be problematic. It can be relatively difficult to compare and integrate results arising from mixed-methods research, especially when there are discrepancies in results arising between different methods (Creswell, 2003). Moreover, Rosenberg (1988) has argued that quantitative and qualitative research methods are derived from distinct and incompatible paradigms and that using them together is not possible or desirable as it would destroy the epistemological foundations of each method. Most researchers who use mixed-methods, however, adopt a pragmatic approach. While they accept that quantitative and qualitative methods have different epistemological foundations, they see

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<sup>15</sup> Each of the research methods which has been chosen for this research is intended to address a different research subquestion. Consequently, this mixed-method approach will not result in true triangulation, which is only achieved when methods address the same research question (Veal, 2006). There will, however, be some triangulation as the methods of enquiry are intended to build towards the overall understanding of how neighbourhood deprivation influences older adults' LTPA participation.

that much can be gained by combining their respective strengths and suggest that research methods and sources of data are much less wedded to epistemological presuppositions than is commonly supposed (Lewis-Beck et al., 2004). Mixing different methods is seen as a flexible and holistic means of approaching a research question because each method is able to highlight different aspects of the research problem (Lewis-Beck et al., 2004).

In keeping with a pragmatic approach, each of the methods employed in this research was selected to answer a specific research subquestion related to the primary inquiry: how does neighbourhood deprivation influence older adults' LTPA participation? The methods of data collection included a recall survey of LTPA behaviour, Q method with photographs of local leisure settings and a semi-structured interview about the perceptions and experiences of neighbourhood LTPA. In the following descriptions of each of the research methods, slightly more attention is given to Q method as readers of this thesis are likely to be less familiar with this approach given that it has been under utilised in social-scientific research.

### **3.7 Components of the research**

#### **3.7.1 Recall survey**

A recall survey was employed in this research to identify the patterns and prevalence of LTPA participation among older adult residents of East-town and West-town. Patterns of LTPA refer to the settings utilised (home, neighbourhood and out of neighbourhood) and the types of activities undertaken by older adult respondents. The prevalence of LTPA refers to the two-week frequency of LTPA participation. In this section, the recall survey method is described, its general limitations are stated and its application in the present research study is outlined.

Physical activity and leisure behaviour are often assessed by asking people to recall details of their participation (Mitra & Lankford, 1999; U.S. Department of Health and Human Services, 1998). Recall surveys require people to remember either general or precise details about their past participation in physical activity or leisure over a period of time ranging from one week to a lifetime (U.S. Department of Health and Human Services, 1998). Surveys of this type are regarded as a relatively efficient means of obtaining information about the type, frequency, duration and intensity of physical activity and leisure behaviour (Cushman & Veal,

1993). International and New Zealand studies which have investigated physical activity and leisure behaviour have often used recall surveys as a primary means of data collection (Crombie et al., 2004; Lim & Taylor, 2005; Sport and Recreation New Zealand, 2003, 2004). Recall surveys are usually quantitative in nature and ask questions in the same way across a number of cases, providing a simple and efficient means for constructing a data set and allowing the characteristics of cases to be easily described and compared with other cases (Lewis-Beck et al., 2004). Recall surveys are also noninvasive and easy to administer making them well suited to research involving vulnerable members of society, such as older adults (Babbie, 2004; Booth, 2000).

Recall surveys also have a number of general limitations. If a recall period is too long, older adults can have difficulty remembering specific details of their LTPA participation, and if a recall period is too short, reported physical activity may be affected by factors such as adverse weather or acute illness (U.S. Department of Health and Human Services, 1998). A recall period of two weeks was employed in this research as it was deemed appropriate to control for the possible influence of adverse weather or sickness on LTPA and provide a manageable timeframe for older adults to remember details of their LTPA participation. It was also similar to recall periods used in other studies which have investigated the LTPA behaviour of older adults (Kaplan et al., 2001; Lim & Taylor, 2005). A further limitation is related to the fact that recall surveys rely on respondents' candidly reporting details about their past behaviours, rather than those behaviours being directly observed by the researcher. Consequently, recall surveys are prone to a social desirability bias, which often leads to an overestimation of activity levels (Sallis & Saelens, 2000). This has previously been observed in a number of studies of older adults' physical activity participation (Dergance et al., 2003; Sims et al., 1999). In noting the limitations of recall surveys, however, Sallis and Saelens (2000) concede that such measures have proved useful for identifying types and settings of physical activity, which relates well to this research. Furthermore, overestimation of activity levels is not particularly problematic because it is the relative prevalence of LTPA, rather than the absolute prevalence, that is of importance in this research.

The recall survey was applied in the following manner. Before the survey was undertaken, respondents were shown a map of their neighbourhood, as defined by the researcher, and LTPA was explained for respondents as follows:

Leisure time physical activities are physical activities performed during exercise, recreation, sport or at any other time other than that associated with your regular home duties, work or transportation. Examples include aerobics, cycling for enjoyment or exercise, dancing, DIY for enjoyment, exercising at home, exercise classes, fishing, gardening for enjoyment, golf, indoor bowls or lawn bowls, Kapa haka, running or jogging, swimming or swimming pool exercises, tennis, walking for pleasure or exercise, weight training and yachting.

Respondents were then asked to report a number of background details, including age, sex, years of residence at their current address, whether or not they had a disability or medical condition that limited their ability to be physically active<sup>16</sup>, and whether or not they had participated in LTPA in the two weeks prior to their participation in the research. If respondents indicated that they had recently participated in LTPA, they were then asked to recall the number of times during the previous two weeks that they participated in LTPAs at their home, in their neighbourhood and outside their neighbourhood. Additionally, respondents were asked to identify all of the types of LTPA that they had participated in within each setting. Administration of the recall survey was followed by the more interpretive and qualitative methods of Q method and semi-structured interviewing.

### **3.7.2 Q method with photographs**

Q method with photographs was employed in this research to systematically identify and explain the kinds of neighbourhood leisure settings that older adults from East-town and West-town preferred for their LTPA participation. The identification of the preferred leisure settings in East-town and West-town revealed the kinds of places that were most likely to be utilised by older adults for LTPA. In this section, Q method is described, its general limitations are stated and its application in this research is outlined.

Q method is a little known technique employed in the social sciences for the systematic study of human subjectivity, which can be defined as a person's own point of view about a real or perceived situation (McKeown & Thomas, 1988). Q method combines the statistical technique of factor analysis with qualitative interviewing to identify patterns of subjective viewpoints among a group of individuals (McKeown & Thomas, 1988). Q method was devised in the 1930s by the psychologist William Stephenson and has previously been employed to study preferences and attitudes in relation to politics, environmental

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<sup>16</sup> These background variables are usually recorded in research which investigates neighbourhood influences on physical activity because they are often found to be correlated with LTPA (Balfour & Kaplan, 2002; Booth et al., 2000; Giles-Corti & Donovan, 2002b).

management, landscape change, tourism, healthcare, education and religion (Brown, 1980; Chinnis, Paulson & Davis, 2001; Fairweather & Swaffield, 2001; Swaffield & Fairweather, 1996; Wooley & McGinnis, 2000). Q method, however, still remains relatively underutilised in the social sciences and has had negligible application in the fields of physical activity epidemiology or leisure studies.

The basic distinctiveness of Q method over more conventional research methods, such as surveys, is that it is concerned with establishing patterns across individuals rather than patterns across individual traits, such as age, sex or class (Barry & Proops, 1999). In survey research, the basic phenomenon of interest is the trait or characteristic of the individual, and interest centres on the relationships between variables as molecular components of behaviour (Brown, 1980). In Q method, however, the basic phenomenon of interest is the whole response or viewpoint of the individual, which is presumed to be nonfractional and subjective, and interest focuses on the relationships between individual viewpoints (Brown, 1980). Q method groups individuals whose viewpoints are highly correlated with each other to produce an idealised, hypothetical point of view which best represents the group (Eden, Donaldson & Walker, 2005). Thus, the benefit of Q method is that it permits the systematic identification and explanation of the commonly-held viewpoints that are present within a group of people in relation to a particular topic.

In practice, Q method requires respondents to sort a relatively representative set of stimulus items<sup>17</sup>, known as a *Q sample*, into a bell-shaped distribution in response to an instruction from the researcher (McKeown & Thomas, 1988). The Q sample contains between 20 and 60 items, in order to be both comprehensive and manageable, and is derived from the wider *communication concourse*, which is the entire discourse that surrounds a topic<sup>18</sup> (Eden et al., 2005; McKeown & Thomas, 1988). The bell-shaped distribution permits the statistical comparison of individual Q sorts and the identification of the commonly-held viewpoints, known as *factors*, within a group (Addams, 2000). Factors are clusters of two or more people who have ranked a set of items in essentially the same fashion and who can be said to hold a similar point of view about a particular topic (Brown, 1980; McKeown & Thomas, 1988). A factor is not an average of subjects' viewpoints, but an idealised formulation or extension of a

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<sup>17</sup> A stimulus item is usually a statement about a particular topic, but it can also be a photograph or any other material that can be ranked or sorted (Addams, 2000).

<sup>18</sup> The communication concourse can be derived in either a *naturalistic* or *ready-made* manner. Naturalistic concourses are generated from direct contact with individuals who have a close association with the research topic (McKeown & Thomas, 1988). Ready-made concourses, in contrast, are generated from secondary sources such as newspaper articles, prior research findings or expert knowledge (McKeown & Thomas, 1988).

pattern of subjectivity indicated by the group of subjects forming that factor (Eden et al., 2005). At the completion of the Q sort, respondents are usually asked to explain the reasons for their particular arrangement to draw out any underlying feelings and attitudes, which provides additional data for the interpretation and explanation of the prevailing factors (Addams, 2000)<sup>19</sup>.

Q method with photographs has a number of general limitations. In Q method, the researcher can potentially bias the results through the unstructured and selective choice of the Q samples and through the subjective interpretation of factors (Robbins & Kreuger, 2000). Potential researcher bias in the selection of the Q sample and in the interpretation of factors is somewhat balanced, however, by respondents' subjective and self-modelled point of view which identifies unique and often unexpected themes that are largely independent of researcher influence (Barry & Proops, 1999; McKeown & Thomas, 1988). The use of photographs as stimulus items can also be problematic. It can sometimes be difficult to know whether participants are responding to what a photograph represents or to the purely aesthetic qualities or foreground details in the picture as photographs do not have the connotative meaning of written statements (Fairweather & Swaffield, 2000). Furthermore, it can be difficult to standardise photographs within the Q sample to ensure there is no bias in terms of brightness, contrast, perspective and weather conditions, which could all influence participant responses to an image (Fairweather & Swaffield, 2000). The problems associated with the use of photographs as stimulus items tend to be more theoretical than practical, however. Researchers have noted that as long as careful instruction is provided, respondents generally have little difficulty sorting images based on what they represent, rather than by their compositional attributes (Fairweather & Swaffield, 2000).

In this research, Q method was applied in the following manner. Two researcher-selected (ready-made) communication concourses were created: one for East-town and one for West-town. These concourses were then used to generate an independent Q sample for each neighbourhood. The small scale of the areas under investigation made it relatively simple to identify and photograph all of the publicly accessible leisure settings within each neighbourhood<sup>20</sup>. Leisure settings that were photographed were identified from Christchurch

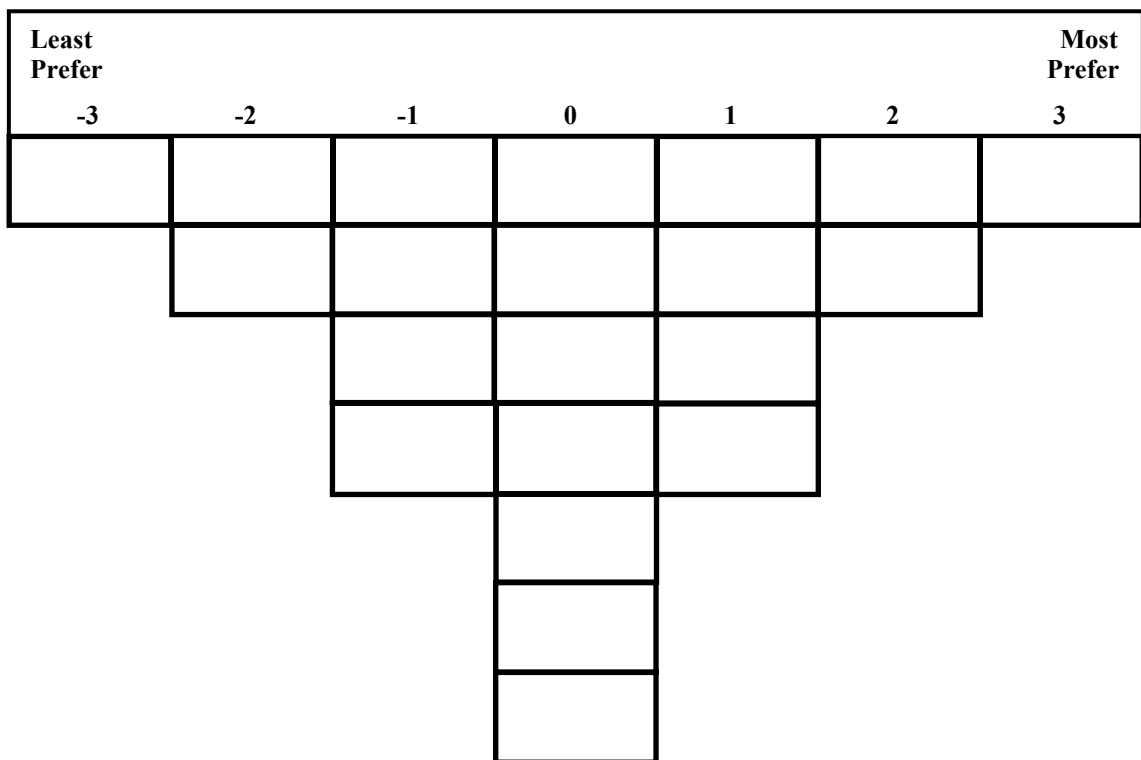
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<sup>19</sup> For a more in-depth description of the technical procedures and philosophy of Q method see "Q Methodology" by McKeown and Thomas (1988) or "Political subjectivity: Applications of Q methodology in political science" by Brown (1980).

<sup>20</sup> In an effort to reduce bias in the composition of the images, all photographs were taken on a sunny and cloudless day; however, no attempt was made to control the lighting and perspective.

neighbourhood maps (Christchurch City Council, 2006a, 2006b), the Christchurch City Council’s database of public facilities and exhaustive on-foot investigations. The communication concourse for each neighbourhood contained over 150 photographs of local leisure settings. The Q sample for each neighbourhood was reduced to 21 photographs, which represented all of the different kinds of leisure settings within each neighbourhood (see Appendices IV and V). Selection of the Q samples proceeded in an unstructured manner in which photographs were selected by the researcher because of their perceived relevance to the topic under investigation (McKeown & Thomas, 1988). Respondents were asked to sort the 21 photographs of their neighbourhood leisure settings into an inverted, bell-shaped distribution (see Figure 5) in accordance with the following instruction: “Please arrange these photographs from least preferred to most preferred according to the places that you like for leisure time physical activity”.

Figure 5: Q-sort distribution for 21 images



After sorting the photographs into the distribution based on their preference, respondents were asked to explain the reasons for their particular arrangement of photographs, paying the most attention to the seven most preferred and seven least preferred images. The application of Q method with photographs was followed by a semi-structured interview.



### 3.7.3 Semi-structured interviewing

Semi structured interviewing<sup>21</sup> was used in this research to identify how older adults from East-town and West-town perceived their neighbourhood leisure environment and to identify the factors that older adults' perceived to influence their LTPA participation. In the following section, the technique of semi-structured interviewing is described, its general limitations are discussed and its application in this research is explained.

Semi-structured interviewing is a qualitative data gathering technique which employs a somewhat predetermined and topic-centred interview guide that is related to specific research questions, but which retains flexibility in the way issues are broached and explored (Dunn, 2005). Semi-structured interviewing allows for data to be forthcoming in the respondents own words, providing a fuller and more holistic understanding of the research topic which is receptive to diverse and unexpected perspectives (Lewis-Beck et al., 2004). Semi-structured interviewing is considered to be a valuable means of accessing information about complex motivations and behaviours; collecting a diversity of meaning, opinions and experiences; checking and verifying tentative conclusions with respondents; and filling gaps in knowledge that cannot be readily obtained with other methods, as in this case (Dunn, 2005). Qualitative interviewing has been used on a number of occasions in leisure research to investigate the experience of LTPA for older adults (Dionigi, 2002; Grant, 2001; Mansvelt & Perkins, 1998); however, the use of this technique in epidemiological investigations relating to the determinants of older adults' LTPA has been more limited (Michael et al., 2006).

Semi-structured interviewing has a number of general limitations. The inherent flexibility of the questioning procedure exposes it to potential researcher bias because inconsistencies in the way questions are phrased or ordered by the interviewer may influence participant responses (Mitra & Lankford, 1999). Arguably, however, it is the flexibility of semi-structured interviewing which allows questioning to proceed smoothly and naturally; mimicking a guided conversation and eliciting in-depth and topic-relevant information in a respondent's own words (Babbie, 2004). Semi-structured interviewing has also been criticised for producing unstandardised data that do not readily permit comparison between cases, as surveys do (Lewis-Beck et al., 2004). Concerns about the lack of standardisation and comparability of the results are, however, largely misplaced because semi-structured

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<sup>21</sup> The semi-structured interviewing employed in this research is completely separate from the short, qualitative questioning that followed and was part of the Q-sort procedure.

interviewing uses a logic where comparisons are based on the full and holistic understanding of each case, rather than the standardisation of a limited number of variables across cases (Lewis-Beck et al., 2004). Another difficulty with semi-structured interviewing is that people are not uniformly articulate and perceptive and there may be large differences in the quality of interview material elicited from different respondents (Creswell, 2003). This is problematic because the analysis and interpretation of results may be biased towards those respondents who could most clearly express themselves, marginalising the voice of the less articulate. While it can be difficult to elicit uniformly articulate responses across an entire sample group, prompts and probing questions can be used to elicit greater detail or clarification of statements from less articulate respondents.

The semi-structured interview was administered at the completion of the Q sort procedure. The semi-structured interview was undertaken last of all because it followed on smoothly from the respondents' candid explanations of their Q sorts and because the flow of the research instrument moved from quantitative to more qualitative methods. During the interview, respondents were asked five questions which were designed to elicit in-depth information about their perceptions of the neighbourhood leisure environment and the perceived influences on older adult residents' LTPA participation. These questions included the following:

1. What is your neighbourhood like for leisure time physical activities?
2. How suitable is your neighbourhood for older adults' leisure time physical activities?
3. Is there anything about your neighbourhood that influences your participation in leisure time physical activities?
4. Would your participation in leisure time physical activities be different if you lived in a different neighbourhood?
5. Can you think of anything else, aside from neighbourhood features, that has an influence on your participation in leisure time physical activities?

The interview questions had no predetermined order or fixed phrasing and were augmented with probing questions and prompting as required. Responses were tape recorded to facilitate analysis.

## 3.8 Data analysis

### 3.8.1 Recall survey analysis

Quantitative data derived from the recall survey were entered into an SPSS spreadsheet. The SPSS statistics program (Version 15) was used to analyse the data and produce a range of descriptive and inferential statistics to identify the patterns and prevalence of LTPA. Descriptive statistics, including means, standard deviations, frequencies and percentages, were used to describe the characteristics of the sample groups and to identify the patterns (type and setting) of LTPA participation among older adult respondents from East-town and West-town. A number of inferential statistics, including *t* tests and a standard multiple regression, were employed to determine and compare the prevalence of LTPA and to identify potential influences on LTPA participation. Three independent samples *t* tests were used to identify if there were statistically significant differences in the mean, two-week prevalence of home, neighbourhood and out of neighbourhood LTPA between the East-town sample and the West-town sample. A multiple regression analysis was employed to identify if any of the survey variables (age, sex, length of neighbourhood residence, health status and neighbourhood deprivation) were associated with the mean, two-week prevalence of overall LTPA among the total sample.

In studies where multiple and related tests for significance, such as *t* tests and multiple regression, are conducted upon the same data set, there is an increased likelihood of committing a *type I error*: erroneously identifying a nonsignificant result as statistically significant (Lewis-Beck et al., 2004). The most commonly used method for controlling type I error is the *Bonferroni Correction*, which divides the standard significance level of  $p = .05$  by the number of tests performed to produce a more rigorous value with which to judge the significance of the results (Lewis-Beck et al., 2004). It has been argued, however, that commonly used methods for controlling type I error, such as the Bonferroni Correction, unjustifiably increase the probability of committing a *type II error*: disregarding findings that are, in fact, significant (Perneger, 1998). Due to the exploratory nature of this research, a significance value of  $p = .05$  has been used and no correction has been made. Thus, it should be understood that the results reported in this research are based on an uncorrected level of significance.

### 3.8.2 Q method analysis

Analysis of the Q sort results is comprised of two steps. First, significant factors are identified based on the statistical output of the PQMethod program (Version 2.11) and on the researcher's inspection of the factor array. Secondly, each factor is named and described based on a process of *abduction*. Abduction is a method of reasoning in which one formulates a hypothesis that appears to best explain the relevant evidence (Lewis-Beck et al., 2004).

Data from each Q sort were entered into the PQMethod program<sup>22</sup>. Analysis of Q sorts is performed automatically by PQMethod and involves the statistical techniques of principle components factor analysis followed by varimax rotation. These procedures identified significant factors present within the East-town and West-town Q sorts. Factors are selected based on the number of individuals who are *significantly loaded* upon each factor. A significant loading is a correlation coefficient<sup>23</sup> that is sufficiently high to assume that a relationship exists between an individual Q sort and a factor (Addams, 2000; Brown, 1980). A factor with two or more significant loadings is generally regarded as significant, but factors become most stable at around 10 significant loadings (Fairweather, 2002).

Factors are selected not only by the number of significant loadings, but also by more subjective criteria because some factors emerging from the statistical analysis may have arisen by chance and be impossible to explain. In addition to the statistical output from PQMethod, the researcher also has to inspect each *factor array* and the *distinguishing items* within each array to determine whether there is sufficient information to develop an explanation that characterises the factor. A factor array is the idealised Q sort that is generated from the individual Q sorts of respondents who loaded significantly on that factor (Addams, 2000; McKeown & Thomas, 1988). Distinguishing items are the photographs within each factor array that most discriminate between different factors and which are significantly correlated with a particular factor (Eden et al., 2005).

Once significant factors have been identified through statistical analysis and inspection of the factor arrays, they are named and described using a process of abduction. Naming and

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<sup>22</sup> The PQMethod program is accessible and downloadable at [www.qmethod.org](http://www.qmethod.org).

<sup>23</sup> Statistical significance at the standard alpha level of  $p = .05$  level is determined by the following formula:  $1.96(1/\sqrt{N})$ , where  $N$  is the total number of items in the Q sample (Brown, 1980). For both the East-town and West-town samples, the significant loading was as follows:  $1.96(1/\sqrt{21}) = .43$ . Respondents' whose individual Q sort correlated at greater than .43 to the factor were said to be significantly loaded on that factor.

describing each factor is a fundamentally interpretive process in which the researcher must carefully abduct the meaning of the factor on the basis of available information (Eden et al., 2005). In this research, abduction was based on the following evidence: the seven most preferred and seven least preferred photographs in each factor array; the distinguishing photographs for each factor; and respondent comments about their Q sorts. Respondent comments are included in the description of each factor as support for the researcher's interpretation. Thus, each factor was identified and explained by a combination of statistical analysis and researcher interpretation.

### **3.8.3 Semi-structured interview analysis**

Qualitative data obtained from the semi-structured interviews were tape recorded, transcribed to computer and then *coded* by hand to draw out the prevailing themes relating to older adults' perceptions of LTPA in their neighbourhood. Coding refers to the organisational process of categorising and sorting data into themes which forms the link between data collection and its conceptual rendering for analysis (Lofland & Lofland, 1995). In this research, coding was undertaken with reported perceptions relating to the neighbourhood leisure environment and the perceived influences on participation that were manifest as sentences and paragraphs within individual interview transcripts. Analysis of qualitative interview data is conceived of as an "emergent product of gradual induction" in which the researcher attempts to create a sense of order and coherence from the diverse material obtained from respondents (Lofland & Lofland, 1995, p. 181). Further to this, qualitative analysis of interview transcripts is a fundamentally creative process in which the researcher acts as a reflexive filter for the results, identifying and refining the emergent themes contained within the body of material (Lofland & Lofland, 1995). Following this approach, the researcher organised the coded data relating to older adults' perceptions into themes that were related to the research topic based upon his subjective interpretation of inherent meanings within the coded data. Respondent quotations are presented in the results as the primary evidence for the themes derived from the semi-structured interviews.

## **3.9 Chapter summary**

A high-deprivation neighbourhood, East-town, and a low-deprivation neighbourhood, West-town, incorporating researcher-defined and distance-based neighbourhood boundaries,

were selected for inclusion in this research. Thirty-one older adults from East-town and 32 older adults from West-town were systematically selected and recruited from the centre of each neighbourhood. The research design was characterised by cross-sectional, comparative and mixed-methods elements. The research instrument was comprised of three distinct methods: a recall survey, Q method with photographs and semi-structured interviewing. Each method was employed to answer a different research subquestion and contributed to an overall understanding of how neighbourhood deprivation influences older adults' LTPA participation. The research methods provided a mixture of quantitative and qualitative data which are presented separately in the results chapter which follows.

# Chapter Four: Results

## 4.1 Chapter introduction

This chapter presents the results of the three different methods of data collection used in this research: a recall survey, Q method with photographs and semi-structured interviewing. The findings from each research method are presented separately in the context of each research subquestion, and no attempt is made to produce a coherent overview of the research findings. Integration of the research findings occurs in the discussion chapter which follows. The results for the recall survey are presented first, followed by those for Q method and the semi-structured interviews.

## 4.2 Research question one: What is the pattern and prevalence of LTPA participation among older adults who live in high- and low-deprivation neighbourhoods?

A recall survey was used to compare the patterns and prevalence of neighbourhood leisure time physical activity (LTPA) among older adults from the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. The results of the recall survey also contribute to an overall understanding of how neighbourhood deprivation influences older adults' LTPA participation.

### 4.2.1 Neighbourhood group characteristics

At the beginning of the recall survey, a number of characteristics of the sample groups were recorded (see Table 2). The two sample groups that participated in the research exhibited similar characteristics in relation to number of women and men, mean age and mean length of neighbourhood residence, but there appeared to be some disparity in terms of health status and two-week LTPA participation.

Table 2: Characteristics of the East-town and West-town sample groups

<b>Sample group characteristics</b>	<b>East-town</b>	<b>West-town</b>
Number of women	18	22
Number of men	13	10
Mean age in years	77.7 ( <i>SD</i> = 7.63)	76.6 ( <i>SD</i> = 7.08)
Mean length of neighbourhood residence in years	21.3 ( <i>SD</i> = 23.4)	17.9 ( <i>SD</i> = 17.5)
Percentage of the sample with a medical condition or disability that restricted physical activity	68%	56%
Percentage of the sample who participated in LTPA during the two weeks prior to the research	81%	94%

#### 4.2.2 Patterns of LTPA

Descriptive data (see Table 3) derived from the recall survey showed that older adults from both East-town and West-town participated in the similar types of LTPAs in the two weeks prior to the research. The most commonly reported activities in both neighbourhoods were walking, home exercise and gardening.

Table 3: Frequently reported LTPAs in East-town and West-town

<b>LTPAs</b>	<b>Percentage of all reported LTPAs</b>	
	<b>East-town</b>	<b>West-town</b>
Neighbourhood walking	34%	37%
Home exercise	32%	27%
Gardening	22%	14%
Out of neighbourhood walking	5%	7%
Other activities	7%	15%

Older adult respondents from East-town and West-town not only participated in similar types of LTPAs, but they also utilised similar leisure settings. The most commonly utilised leisure settings for older adult residents of East-town and West-town were the home and neighbourhood, with the small remainder of activities being undertaken outside the neighbourhood. In East-town, 54 percent of all reported LTPAs were undertaken at home and 37 percent of activities were undertaken in the neighbourhood. In West-town, 41 percent of all reported LTPAs were conducted at home and 45 percent of activities were undertaken in the neighbourhood.

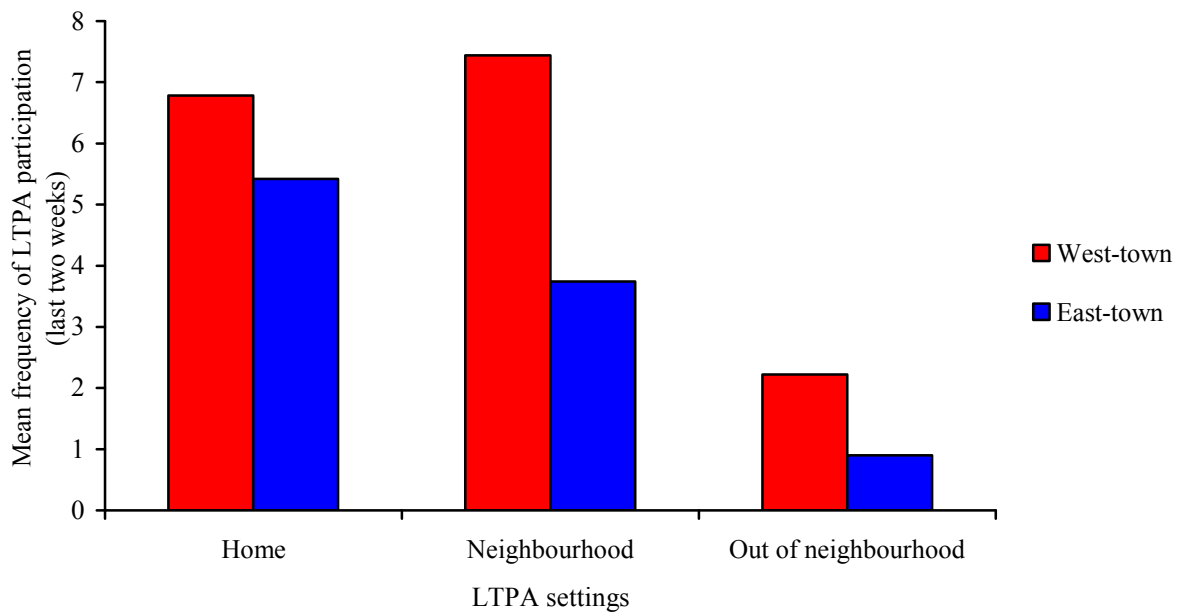
#### 4.2.3 Prevalence of LTPA

Although older adults from East-town and West-town participated in comparable types of activities and utilised similar leisure settings, there were differences in the mean frequency of LTPA participation between the neighbourhoods of high and low deprivation (see Figure



6). Across each of the three leisure settings (home, neighbourhood and out of neighbourhood) studied in this research, older adult respondents from the low-deprivation West-town sample participated in LTPA, on average, more frequently than older adult respondents from the high-deprivation East-town sample.

Figure 6: Mean frequency of LTPA participation by setting



Independent samples *t* tests were employed to investigate whether differences in mean LTPA frequency were statistically significant. There was no significant difference in home-based LTPA between East-town respondents ( $M = 5.42$ ,  $SD = 6.14$ ) and West-town respondents ( $M = 6.78$ ,  $SD = 6.90$ ),  $t(61) = -.83$ ,  $p = ns$ . A statistically significant difference in neighbourhood LTPA, however, was found between East-town respondents ( $M = 3.74$ ,  $SD = 4.73$ ) and West-town respondents ( $M = 7.44$ ,  $SD = 6.36$ ),  $t(61) = 2.61$ ,  $p = .01$ . A statistically significant difference in the out of neighbourhood LTPA was also identified between East-town respondents ( $M = .90$ ,  $SD = 1.47$ ) and West-town respondents ( $M = 2.22$ ,  $SD = 3.16$ ),  $t(44) = -2.13$ ,  $p = .04$ . Thus, it appears that residential location had a statistically significant influence on both neighbourhood and out of neighbourhood LTPA participation and that residing in the high-deprivation neighbourhood of East-town may have been associated with a reduced prevalence of LTPA participation.

A standard multiple regression analysis was conducted (see Table 4) to explore the ability of the five independent variables that were measured in the recall survey (neighbourhood deprivation, sex, age, length of neighbourhood residence and health status) to

predict the overall prevalence of LTPA. The five predictor variables accounted for 27.5 percent of the variance in the mean frequency of total LTPA, which was highly significant  $R^2 = .28$ ,  $F(5, 57) = 4.32$ ,  $p = .002$ . Of the five independent variables, neighbourhood deprivation, sex and health status were found to be significantly correlated with LTPA participation. Neighbourhood deprivation demonstrated a very significant effect on LTPA ( $\beta = .32$ ,  $p = .007$ ). In support of the  $t$  test findings, the results of the multiple regression analysis showed that respondents from the low-deprivation West-town neighbourhood participated in LTPA more frequently than respondents from the high-deprivation East-town neighbourhood. Health status had an equally significant effect on LTPA participation ( $\beta = .33$ ,  $p = .007$ ). Respondents who reported having no medical condition or disability that limited their ability to be physically active participated in LTPA more frequently than those who reported having a restrictive medical condition or disability. Sex was also significantly correlated with LTPA ( $\beta = -.25$ ,  $p = .035$ ). Male respondents participated in a higher frequency of LTPA than female respondents. None of the other predictor variables had a significant influence on the overall prevalence of LTPA.

Table 4: Multiple regression analysis for mean frequency of total LTPA ( $N = 63$ )

Model	Unstandardised Coefficients		Standardised Coefficients	Sig.
	B	Std. Error	Beta ( $\beta$ )	
Deprivation level (1 = high deprivation, 2 = low deprivation)	6.31	2.27	.319	.007**
Age	.153	.171	.112	<i>ns</i>
Sex (1 = males, 2 = females)	-5.06	2.34	-.247	.035*
Years of neighbourhood residence	-.002	.059	-.004	<i>ns</i>
Presence of a medical condition or disability (1 = condition present, 2 = no condition)	6.72	2.42	.330	.007**

\* Significant at  $p < .05$ , \*\* Significant at  $p < .01$

#### 4.2.4 Summary of recall survey findings

The results of the recall survey showed that older-adult respondents living in the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town participated in similar kinds of LTPAs and that neighbourhood walking, home exercise and gardening, were the most commonly undertaken activities in both neighbourhoods. East-town and West-town respondents also utilised similar leisure settings, and home and neighbourhood were the most frequently reported sites of LTPA participation. Despite comparable patterns of activity, there was a statistically significant difference in the prevalence of neighbourhood and out of neighbourhood LTPA participation between older

adults who were living in the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. Participation in LTPA was found to be significantly associated with sex, health status and neighbourhood deprivation. Older males participated in LTPA more frequently than older females. Individuals who reported being in good health participated in LTPA more often than individuals who reported having an illness or disability. Respondents from the low-deprivation neighbourhood of West-town participated in LTPA more frequently than respondents from the high-deprivation neighbourhood of East-town. Age and length of neighbourhood residence appeared to be unrelated to the prevalence of LTPA participation. The findings of the recall survey are discussed and integrated with the findings from Q method and semi-structured interviewing in the discussion chapter.

### **4.3 Research question two: What kinds of neighbourhood leisure settings do older adults who live in high- and low-deprivation neighbourhoods prefer?**

Q method with photographs was used to identify the kinds of neighbourhood leisure settings that older adults from East-town and West-town preferred for their LTPA. Respondents from both neighbourhoods sorted 21 images (see Appendices IV and V), which represented their own neighbourhood leisure environment, into a bell-shaped pattern in order of preference. Statistical analysis, performed automatically by the PQMethod program, revealed a number of significant factors in each sample group. The sections which follow present a description and interpretation of each factor that emerged from the two separate Q sorting procedures undertaken in East-town and West-town. The relevant statistical data for each factor are summarised in Tables 5 and 6. Each factor has been given a name which is indicative of the qualities that it embodies. A comparison of the two neighbourhoods appears at the end of this section<sup>24</sup>.

#### **4.3.1 The East-town Q sort**

Three significant factors emerged from the East-town Q sort, and 90 percent of East-town respondents were loaded on the three-factor result. Factor One was the most dominant,

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<sup>24</sup> It should be recalled that comparisons made between the factors emerging from East-town and West-town are based on a qualitative interpretation as the results are derived from two separate Q samples and two separate statistical analyses.

with 22 people loaded on this factor. Factors Two and Three were supported by two and three individuals respectively and appeared to be somewhat idiosyncratic points of view; however, as they were distinct from Factor One and had emergent themes, they were included in the results. At first glance, the Q sort data from the PQMethod program also appeared to support four-factor and five-factor outcomes. These, however, were not selected because the themes they expressed had no readily discernable patterns or coherence, and a number of the factors appeared to be variants of more dominant factors rather than perceptibly distinct points of view. The key data for the three significant East-town factors are summarised in Table 5.

Table 5: Factors and Q sort values for photographs in the East-town sample

Photo number	Photograph description	Factor arrays		
		1 Restful Nature ( <i>n</i> = 22)	2 Functional Facilities ( <i>n</i> = 2)	3 Social Interaction ( <i>n</i> = 3)
1	Pathway through green open space	1	0	3*
2	Pathway through green open space and trees	1*	0	0
3	Green open space	0	-1*	1
4	Tree-lined footpath	1*	-1	-1
5	Rugby field	0	1	1
6	Footpath through shops	-1	-1	2*
7	Flower garden	3*	0	0
8	Pathway through a flower garden	2*	0	0
9	Maori meetinghouse	0	1	-3*
10	Gardens and green open space	2	1	0*
11	Green open space and trees	1	0*	1
12	Church hall	0	0	-2*
13	Bare footpath	0	-1*	0
14	Tennis courts	-1*	2	1
15	Cycle lane	0	-1	-1
16	Bowling green	-1*	2	2
17	Bare footpath next to a high fence	-3	-3	0*
18	Swimming pool	-1	1*	-1
19	Footpath with a grass verge	0*	-2	-2
20	Gym/health club	-2	3*	-1
21	Footpath in an industrial area	-2	-2	0*

3 = most preferred, -3 = least preferred, 0 = relative indifference

\* distinguishing photographs ( $p < .05$ )

#### 4.3.1.1 Factor One: Restful Nature

The distinguishing and preferred photographs for Factor One included a flower garden, a pathway through a flower garden and a pathway through green open space and trees. Characteristics of the most preferred photographs included grass, trees, flowers, bench seating and off-street pathways. Factor One appears to show that many of the older adults in East-town preferred neighbourhood leisure settings which offered aesthetically pleasing, natural scenery and afforded opportunities for both physical and mental rest and recuperation. Factor

One has been characterised as “Restful nature”. In the context of this research, the term *restful* refers to the quiet or soothing qualities of a location (Pearsall, 1998). *Nature* refers to the physical world, which collectively includes plants, animals, landscapes and other products of the earth (Pearsall, 1998).

Natural features, such as the trees and flowers that were found in abundance in public parks and gardens in East-town, were seen to be aesthetically pleasing and visually stimulating by older adults and were regarded as important settings for LTPA. Respondents commented, “There’s lots of nature there; it’s pretty and restful” and “I like the flowers and the trees; it’s warm, it’s nature” and “Pleasant to look at when you walk around” and “Good for the eye; I could see myself exercising there”. From the respondents’ comments, it is apparent that the presence of nature was regarded as satisfying and was conducive to LTPA.

In addition to their aesthetic character, natural-looking leisure settings also embodied the qualities of physical and mental rest and recuperation. While rest and recuperation may seem opposed to physical activity, they are, in fact, closely related concepts for older adults. Rest and recuperation can be physical, in terms of sitting or standing following a burst of activity, or mental, in terms of contemplating or meditating on the surroundings while walking.

Prolonged activity may be unsustainable for some older adults and the opportunity to alternate activity and rest makes participation in LTPA more manageable. Respondents commented about the physical rest afforded by natural settings: “I like the way you could walk through it and sit down if you want to” and “It’s nice and restful; you feel like you could go there and sit down and have a good rest” and “Nice seat to sit on and enjoy your leisure”. It seems that natural places, particularly those with available bench seating, provided an idyllic context for those older adults who loaded on Factor One to alternate both physical activity and rest in their leisure time.

Respondents also commented about the mental rest afforded by the natural settings. Contrast the above statements relating to physical rest with the following: “I’d love to walk there and be at peace” and “Very restful, the shadows on the trees and that sort of thing, very peaceful, nice walk”. Clearly, respondents who loaded on Factor One regarded natural settings not only as good places to be physically active, but also as places to restore mental energies.

When explaining their Q sorts, older adults who preferred Restful Nature settings indicated that their most preferred activity was walking. This preference for walking, however, was not merely for the physical act of locomotion, but as a means to access and experience Restful Nature. This was evidenced by the fact that those photographs in the factor array which were completely given over to nature were more preferred than those which had pathways running through them. The act of walking appeared to be a somewhat incidental activity which facilitated access to and enjoyment of Restful Nature settings.

The salience of the Restful Nature theme was also reinforced by the least preferred settings of older adults who loaded significantly on Factor One. The least preferred images in the factor array included a bowling green, tennis court, swimming pool and bare footpaths. All of these photographs were characterised by a lack of aesthetically pleasing, natural features. Thus, it seems that older adults who loaded on Factor One preferred the most natural of leisure settings in which they could rest their minds and bodies and focus their attention on the aesthetically pleasing, natural attributes of their surroundings as they walked.

#### **4.3.1.2 Factor Two: Functional Facilities**

The distinguishing and preferred photographs for Factor Two included a gym, a swimming pool and a bowling green. In contrast to the preferences for nature and rest that were evident in Factor One, the characteristics of the preferred photographs in Factor Two included built and indoor leisure facilities that were clearly associated with specific leisure activities. Older adults who loaded on Factor Two appeared to prefer structured leisure settings which facilitated convenient participation in LTPA and accommodated a range of ability levels. Factor Two has been characterised as “Functional Facilities”. In the context of this research, *functional* refers to a location or facility that is designed to be practical or useful, rather than attractive (Pearsall, 1998). *Facilities* refer simply to manmade amenities which are designed for specific leisure activities.

Leisure facilities were particularly valued by those who loaded on Factor Two because they were regarded as appropriate for the ability levels of older adults’. Respondent comments included, “For leisure activity, a gym is manageable; you get a choice of things to do, no pressure to do things, compete with yourself, convenient” and “If there was a sport I could manage in my retirement, it would be lawn bowls; it’s a slower pace, less impact, less

physical effort”. Thus, leisure facilities provided a place for older adults to participate in physical activity in a manner that was manageable and appropriate.

Functional Facilities provided a context for older adults to participate in LTPA even in the face of severe limitations, which facilitated indirect as well as direct participation. Respondents commented, “I think bowling greens are essential for older adults because if you don’t play you can still go round and watch or have a go if you’re able to” and “You move around when you are watching sport; you jump up and down when it gets exciting”. Even if older adults had a restricted capacity for physical activity, Functional Facilities presented the opportunity to watch others being active or to cheer from the sideline, which provided some physical activity, albeit limited.

Based on the comments made in relation to their Q sorts, it appears that older adults who loaded on Factor Two preferred activities which were highly structured and took place in a clearly demarcated leisure setting. Respondents who loaded on Factor Two indicated that walking was not their preferred mode of LTPA, but that they liked to be active in other ways. Playing bowls, going to the gym and being a spectator at a local sporting event were the kinds of activities that these individuals preferred. Thus, it was the functional and leisure-related aspects of the preferred leisure settings, rather than the aesthetic and natural aspects of the environment, which appealed to the older adults who loaded on Factor Two.

The Functional Facilities theme was reinforced by the least preferred images within the factor array. The least preferred photographs depicted a range of footpath settings and a shopping centre. These settings appeared to be indicative of more unstructured and ambiguous LTPAs and of walking, which were unpopular with those who preferred to be active in clearly defined leisure settings that catered for a variety of ability levels.

#### **4.3.1.3 Factor Three: Social Interaction**

The distinguishing and preferred images for Factor Three included a pathway through green open space, a footpath through shops, a bowling green, tennis courts and a rugby field. The distinctive characteristic of these places is that they are settings where people gather to play or to interact and are associated with LTPA. A number of the preferred images also had bench seating present. It appears, therefore, that older adults who loaded on Factor Three preferred leisure settings which facilitated participation in LTPA while observing or

interacting with others. Factor Three has been characterised as “Social Interaction”, which relates to the importance of being around other people in one’s leisure time.

Because of the importance of watching and interacting with other people, the shopping area was particularly valued as a leisure setting for older adults who loaded on Factor Three. Commenting on their LTPA, respondents stated, “It’s shops and people, there’s people down there and I know a lot of people, I go down there to buy a lotto ticket, I go down there to buy a paper” and “I enjoy browsing; I do the malls occasionally and you walk quite a bit around the malls”. Aside from the shopping areas, the open expanses of parks and playing fields also provided a context for both activity and observation. Representative comments included, “Good place to walk around and have a look and see things” and “You can watch the children playing as you wander about”. The respondent comments indicated that being around other people was the primary focus of LTPA for those who loaded on Factor Three.

Factor Three is similar to Factor One in the sense that older adults who preferred socially interactive leisure settings also preferred walking for their LTPA, and walking was undertaken primarily as a mechanism for observing and interacting with other people. This would include, for example, walking through a park where children were playing or browsing the shops on foot. Like Factor One, the presence of bench seating appeared to be an important facilitator of older adults’ experience of watching others and socialising during leisure time, which is also congruent with the notion of alternating activity and rest in later life.

The Social Interaction theme was reinforced by the least preferred leisure settings in the factor array. Least preferred settings included a church hall, a Maori meeting house, a footpath, a cycle lane, a gym and a swimming pool. These settings were disliked either because they were indicative of individual activity, were unrelated to walking or because they were not regarded as good places for observing and interacting with other people during leisure time. Thus, older adults who loaded on Factor Three preferred leisure settings where they could walk, and occasionally sit, and which permitted observing and interacting with other people.

#### **4.3.2 The West-town Q sort**

Three factors emerged from the West-town sample, and 80 percent of West-town respondents were loaded significantly on the factors. Factor One was defined by six



individuals and Factors Two and Three were each defined by nine individuals. Four-factor and five-factor explanations were also possible, but, as above, the themes expressed in these factor explanations had no readily discernable patterns or coherence on first inspection. The key data of the three emergent factors from the West-town Q sort are summarised in Table 6.

Table 6: Factors and Q sort values for photographs in the West-town sample

Photo number	Photograph description	Factor arrays		
		1 Aesthetic Activities ( <i>n</i> = 6)	2 Walkable Nature ( <i>n</i> = 9)	3 Heritage Walk ( <i>n</i> = 9)
1	Bare footpath	-1	0	0*
2	Native bush walk	3	1	2
3	Pathway through green open space	0	2*	0
4	Green open space and trees	1	2*	0
5	Tree-lined footpath	2*	0	1
6	Bare alleyway between two streets	-2	0*	-2
7	Shared pathway next to railway line	0*	1*	-1*
8	Pathway through gardens	0	1	2*
9	Church hall	-2	-3*	-3
10	Garden-lined footpath	0	1	1*
11	Rugby field	0	-1	0
12	Green open space	0	0	-1*
13	Tennis courts	0*	-1*	0*
14	Bowling green	2*	-2	-1
15	Shared footpath	-1	-1	-1
16	Gardens	1	0	3*
17	Pathway next to historic building	1	0	1*
18	Footpath with grass verge	-1	0	0
19	Footpath through shops	-3*	-2*	0*
20	Cycle lane	-1	-1	-2
21	Pathway through green open space and trees	1	3	1

3 = most preferred, -3 = least preferred, 0 = relative indifference

\* distinguishing photographs ( $p < .05$ )

#### 4.3.2.1 Factor One: Aesthetic Activities

The distinguishing and preferred photographs for Factor One included a bowling green, a tree-lined footpath, a bush walk, a pathway next to a historic building, and green open space and trees. The most preferred leisure settings were characterised by a diverse range of striking aesthetic features such as native trees, historic buildings, flower gardens, expansive grassy areas and pristine footpaths and facilities. The respondents who loaded on Factor One seemed to prefer aesthetically pleasing leisure settings which provided a stimulating diversion to and enhanced the enjoyment of LTPA. Factor One has been characterised as “Aesthetic Activities”. *Aesthetic*, as employed in this research, refers to the beauty or pleasing appearance of a location (Pearsall, 1998).

For many of those who loaded on Factor One, the aesthetic qualities of the preferred leisure settings provided a stimulating and diversionary context for LTPA participation. Respondents commented, “Rural looking, nothing intruding, nature at its best, attractive and restful, it would take my mind off the walking” and “Romanticism of the woody dell, good for walking, you don’t have to worry about things rushing out at you, there will be bird song, changes over the year, full of interest, surprising, colourful”. It appeared that the natural characteristics of the preferred leisure settings took respondents’ minds off their walking, in particular, and provided a diversity of sensory stimulation that older adults found satisfying.

A number of those who loaded on Factor One also indicated that the aesthetically pleasing settings directly enhanced their experience of LTPA. Respondents commented, “I like it because I play croquet and the croquet club is at the same venue; nice open setting, eyes can look a long distance, I associate it with physical activity” and “I like walking along nice streets and looking at the gardens and fences and new buildings going up; it makes you happy to live in such a lovely area”. From these comments, it is evident that the aesthetic qualities of the neighbourhood leisure environment augmented the experience of LTPA.

Comments made by those who loaded on Factor One at the completion of their Q sorts, indicated that activities such as walking, bowls and croquet were frequently undertaken in the preferred leisure settings. For the most part, however, it was the aesthetic appeal of the settings, rather than the activities themselves, which appeared to be at the root of the preference for the leisure settings. Being in a leisure setting that was perceived as beautiful or pleasing in appearance enhanced the experience of LTPA and provided an incentive for participation.

The significance of the Aesthetic Activities theme was reinforced by the least preferred photographs in the factor array. The least preferred photographs depicted a footpath through shops, a church hall, a bare pathway between two streets and nondescript footpaths and cycle lanes. These leisure settings were noticeably lacking in natural or interesting features and were, for the most part, characterised by an abundance of grey concrete. It is clear that those who loaded significantly on Factor One were uninterested in utilitarian or functional leisure settings and more interested in locations that were aesthetically pleasing and associated with a variety of LTPAs.

#### 4.3.2.2 Factor Two: Walkable Nature

The distinguishing and preferred photographs for Factor Two included a pathway through green open space and trees, a pathway through green open space, a shared pathway next to a railway line, a bush walk, a garden-lined footpath and a pathway through gardens. Notable characteristics of the preferred leisure settings were native and established trees, gardens and off-street pathways. It is apparent that the older adult respondents who loaded on Factor Two preferred leisure settings that were specifically related to walking and which also provided attractive, natural surroundings. Factor Two has been characterised as “Walkable Nature”. *Walkability* refers to the overall walking conditions of an area and includes the quality of pedestrian facilities, land use patterns, community support, and security and comfort for walking (Victoria Transport Policy Institute, 2007).

The presence of nature was valued by those who loaded on Factor Two because it enhanced the walkability of leisure settings. In particular, the presence of established trees and the appearance of wilderness were appealing to older walkers. Respondents commented, “I like to walk through trees and I love to see the trees in all seasons of the year” and “Wild countryside, jungley, winding path, no sign of habitation; I like the sense of wilderness about it” and “I love that because I walk my dog practically everyday through there; just beautifully relaxing, and the colours change with the seasons and there’s beautiful blue gums straight ahead”. Thus, it seems that the presence of nature provided a significant incentive for walking activities in West-town.

In addition to nature, respondents who loaded on Factor Two also valued off-street pathways because these leisure settings allowed older adults to get away from common urban annoyances and because they were regarded as easy and interesting to walk along. Respondents commented, “Nice green space for walking through in a built up part of the city” and “I like walking through that for the trees and getting away from traffic” and “I walk down there a lot with my walking group; it’s good for my age because the footpath is very smooth”. Clearly, respondents valued leisure settings where walking was prioritised, convenient and comfortable.

The older adults who loaded on Factor Two appreciated the natural characteristics of the preferred leisure settings, but, for the most part, they sorted the photographs on the basis of how easily and enjoyably they could walk within each particular leisure setting. Not

surprisingly, comments made about individual Q sorts also revealed that the older adults who loaded on Factor Two preferred walking above other LTPAs.

The significance of the Walkable Nature theme was reinforced by the photographs of the least preferred leisure settings. The least preferred photographs depicted a tennis court, a footpath through shops, a church hall, a cycle lane, a shared pathway (pedestrians and cyclists), a bowling green and a rugby field. The least preferred leisure settings were characterised by places where walking was not prioritised and where there was a noticeable lack of natural features.

#### **4.3.2.3 Factor Three: Heritage Walk**

The distinguishing and preferred photographs for Factor Three included gardens, a pathway through gardens, a pathway next to a historic building, a garden-lined footpath, a bush walk, a pathway through green open space and trees and a tree-lined pathway. Distinctive characteristics of Factor Three included opulent streetscapes (characterised by wide footpaths, colourful plantings and stone fences), the last remnant of native forest in urban Christchurch, boutique gardens, and historically significant architecture. Respondents who loaded on Factor Three preferred leisure settings that were characteristic of the West-town's affluent British heritage and which also provided amenities for walking. Factor three has been characterised as "Heritage Walk". *Heritage*, as it is used in this research, refers to objects and qualities that have historic or natural value, which have been passed down from previous generations and are usually protected or preserved (Pearsall, 1998).

The presence of heritage items provided an incentive to be active and created a strong community identity. Explaining their preference for heritage settings, respondents commented, "Such a fascinating place and one of the last podocarp forests in the city, it's like a reminder of it, it's a very peaceful place to walk" and "Real old Christchurch, interesting story, attractive place for woods and walks" and "Suggests the past; when you're 91 you go back to days when things were completely different than they are today, you've got a history here". Leisure settings that were imbued with heritage invoked memories and linked to West-town's history, inculcating a shared sense of identity among residents and encouraging LTPA.

In addition to the prominent heritage features, most of the preferred leisure settings were also characterised by footpaths or pathways for walking, and respondent comments at the

completion of their Q sorts indicated that walking was the preferred activity in these leisure settings. In contrast to Factor Two, however, walking was not the goal of the activity, but a means for accessing and appreciating West-town's heritage. Comments included, "Great old building; one of my walking routes" and "I often walk through the rose gardens to see how things are coming on there". Those who loaded on Factor Three were clearly motivated by their historically significant environment, which appeared to act as a catalyst for neighbourhood walking activities.

The significance of the Heritage Walk theme was reinforced by the least preferred images in the factor array, which included a nondescript church hall, a shared pathway next to a railway line, a bowling club, a cycle lane, green open space, and a bare alleyway between two streets. The least preferred leisure settings were places that were not specifically connected to West-town's heritage or unrelated to walking. Thus, for older adults who loaded significantly on Factor Three, the most preferred leisure settings were those that were imbued with the neighbourhood's heritage and which could be enjoyed and admired while walking.

### **4.3.3 Summary and comparison of East-town and West-town Q sorts**

Three factors emerged from the East-town Q sort. Factor One was named Restful Nature and older adults who loaded on this factor preferred leisure settings that were imbued with natural characteristics and which facilitated physical and mental rest and recuperation. Factor Two was termed Functional Facilities and those who loaded on this factor preferred artificial leisure settings that were seen as structured, appropriate and manageable for older adults. Factor Three was called Social Interaction and older adults who loaded on this factor preferred a diverse range of leisure settings that permitted watching and interacting with other people. The three factors that emerged from the East-town sample were clearly distinct and had themes that were broadly connected with nature, facilities and other people. Comments made by respondents at the completion of their Q sorts indicated that individuals who loaded on Factor One and Factor Three preferred leisure settings which facilitated walking for LTPA.

Three factors also emerged from the West-town Q sort. Factor One was named Aesthetic Activities and older adults who loaded significantly on this factor preferred leisure settings that were aesthetically pleasing and which were also indicative of a range of physical activities. Factor Two was termed Walkable Nature and those that loaded on this factor preferred leisure settings that could be easily walked and which also exhibited visually

pleasing, natural features. Factor Three was named Heritage Walk and those that loaded on this factor preferred leisure settings that were indicative of the unique historic, affluent and aesthetic qualities of the West-town neighbourhood. Significantly, all of the factors that emerged from the West-town sample showed a distinctive preference for aesthetically pleasing leisure settings, including the natural and heritage features of the neighbourhood. Comments made by respondents at the completion of their Q sorts indicated that those who loaded on all of the factors, particularly Factors Two and Three, preferred leisure settings where they could walk for LTPA.

The results of the two separate Q sorts undertaken in the high-deprivation neighbourhood of East-town and low-deprivation neighbourhood of West-town showed a number of similarities and differences regarding the preferred leisure settings. The similarities between the two neighbourhoods are outlined first, followed by the differences.

Only three factors emerged from the analysis of both the East-town and West-town Q sorts, which suggests that in both neighbourhoods older adults may have had a limited number of preferred leisure settings and that there may be some homogeneity in terms of environmental preferences in relation to LTPA. In East-town and West-town, there were a number of emergent factors, such as Restful Nature and Walkable Nature, which were characterised by common preferences for the attractive, natural leisure settings. The Q sort data and the comments made by respondents from both neighbourhoods indicated that attractive, natural features, such as public parks and gardens, provided incentives for older adults to be active and enhanced the experience of LTPA. East-town and West-town respondents also showed common preferences for leisure settings that were conducive to walking for LTPA.

Differences were also evident between the East-town and West-town Q sorts. The three factors that emerged from the East-town Q sort were diverse and broadly connected with nature, facilities and social settings. In contrast, the West-town factors were relatively similar as they were all related to the aesthetic attributes of the neighbourhood environment, such as natural features and heritage places. While West-town respondents appeared to value the aesthetic qualities of their neighbourhood as essential components of their preferred leisure settings, East-town residents showed a much wider variety of tastes and seemed to be generally less inclined towards attractive settings. Another important difference between the East-town and West-town Q sorts arose in the comments made by respondents in relation to

the Q samples. Many of the East-town respondents indicated that they were unfamiliar with neighbourhood leisure settings depicted in the Q sample, including some of the prominent parks and recreational facilities. In contrast, the majority of the West-town respondents easily identified most of the neighbourhood leisure settings, and some individuals could even identify the location of footpaths and cycle lanes. Generally speaking, the impression given was that older adult respondents from the low-deprivation neighbourhood of West-town had more intimate knowledge of their neighbourhood leisure environment than older adult respondents from the high-deprivation neighbourhood of East-town.

#### **4.4 Research question three: What are the perceptions of neighbourhood LTPA among older adults who live in high- and low-deprivation neighbourhoods?**

Semi-structured interviews were used in this research to uncover the perceived influence of neighbourhood factors on older adults' LTPA. The interview data revealed a number of shared and divergent themes among older adults from the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. The shared themes are presented first, followed by the divergent themes. Pseudonyms have been used where respondents are quoted.

##### **4.4.1 Shared themes**

Respondents from both East-town and West-town reported a number of common intrapersonal, interpersonal and environmental influences on their LTPA participation. These influences included health and disability, interest and motivation, the availability of an activity partner or group, and the presence of traffic.

###### **4.4.1.1 Health and disability**

Health and disability was reported as an important influence on LTPA by many of the elderly respondents in both East-town and West-town and, unsurprisingly, was most commonly reported by the oldest of the respondents in both neighbourhoods. Conditions that reportedly impacted upon LTPA participation were joint pain and weakness, breathing difficulties and chronic diseases. A number of the elderly respondents from East-town

indicated that they would like to be involved in LTPA, but that poor health was a significant restriction to participation:

I'd like to be able to go for walks. I used to walk right around the whole block, around Percy Street and then come back here. I couldn't do it now because of my back and legs (Nancy, East-town).

I'm annoyed that I can't do as much in the garden. I was never a gardener, but I used to be able to do a lot more. I do a little bit. I have my kneeler and a cushion on top of my kneeler and I kneel down and that, but – ooh – getting up is very hard (Alice, East-town).

There are lots of things out there that I would like to do. I'd like to go swimming, cycling, play bowls, but it's no good getting down on my knees to play bowls if I've got to get two people along to pick me up (Guy, East-town).

The influence of poor health and disability on older adults' LTPA was not only confined to East-town respondents, but was also alluded to by older adults from West-town. In the quote below, Jack expressed his conviction that his physical disabilities were the single most significant constraint on his LTPA participation:

The reason we don't do more is nothing to do with a lack of amenities; it has more to do with infirmity or our own ability to stir ourselves and get involved. If I wanted to, I could play bowls. I couldn't play tennis anymore because of my shoulders. Had I not had my accident, I would have liked to continue with that . . . The biggest single factor in all of this is health. It doesn't really have much to do with one's physical environment; it has more to do with one's own body and things going wrong with it (Jack, West-town).

June, also from West-town, similarly identified poor health as a restriction to LTPA participation:

I'm not as young as I used to be and having asthma slows me down considerably. As you get older the medication doesn't seem to work as much and you haven't got the puff to run around (June, West-town).

It is clear, from the quotations presented above, that poor health and disability influenced older adults' LTPA participation irrespective of their neighbourhood of residence. Older adults from both East-town and West-town also shared the perception that physical declines and reductions in LTPA are an inevitable part of the ageing process and that poor health and disability must be accepted and adapted to. East-town respondent, Bradley, remarked,



We have a problem with the health aspect. When you get older you tend to be paying the price for a lot of your earlier activities, like your sporting achievements and stuff like that. I've got two artificial knees, which means that impact stuff is stuff I can't do. That's why it suits cycling or aqua-cise, aqua-jogging or something like that. I can't play any of the active things like squash and tennis and even golf stretches me now to get around 18 holes (Bradley, East-town).

A similar perspective was also expressed by Penelope, a resident of West-town:

Health's the main thing. It's a restriction. I'd always go tramping on a Wednesday and we'd do away trips and so forth. I don't fuss about it. If I can't do it I can't do it, that's it. Health is the restriction. You just get on with it. I do what I can. I've always been fond of reading, so I read quite a lot. I've got a friend at Sumner and the other day I went down and we walked on the water front. If the tramping people are going on a flat walk, I still do that. I do as much as I can. I've got a motor mower and I can mow the lawn when it needs doing, a few stops in between to gather some breath, so it's just part of growing old. It's no use moaning about it (Penelope, West-town).

Thus, it seems that poor health and disability were significant restrictions to LTPA for older adults from East-town and West-town. Furthermore, older adults from both neighbourhoods viewed decrements in health and functional status as an inevitable part of later life which restricted LTPA participation and forced individuals to adapt to their changing circumstances.

#### **4.4.1.2 Interest and motivation**

In addition to the influence of health status and disability on older adults' LTPA, elderly respondents from both East-town and West-town felt that their LTPA participation was determined, to a large extent, by their level of interest in neighbourhood activities and by their personal motivation to be either active or inactive in their neighbourhood. Lack of interest was a common theme that was alluded to by East-town residents:

I used to do the sit down exercises in the church on the corner and I used to go line-dancing in the community house and I even used to belong to a gym, but I just lost interest (Jackie, East-town).

I keep myself to myself. I've got my pattern. I've never been a person to belong to a club or anything like that. I know some people do in my age group. I'm happy the way I am (Andrea, East-town).

A lack of interest in participating in certain LTPAs was also expressed by older adults who resided in West-town. Adam and Olivia individually commented,

I'm not inclined to this sort of thing. I'm not a sporting sort of person. If I wanted to play bowls I would have a different attitude, but I've never had any desire to (Adam, West-town).

I've never played tennis and I don't play bowls or croquet. I know the facilities are there, but I've never been one for joining clubs. I spent a lifetime keeping out of clubs . . . It's the life I choose for myself. I have friends and we go out to things. I've never been good at sports, but walking I do like (Olivia, West-town).

Personal motivation to be either active or inactive was also mentioned by residents of both neighbourhoods as a significant influence on their LTPA participation. Older East-town residents were remarkably lucid in their discussions about their motivations for activity and their divergent comments revealed how different the experience of LTPA in later life can be.

Apart from an odd twinge or two I am able to [participate in LTPA], but I also think sometimes 'you could get off your backside and do it'. It would be hard at first, but even if you only did five or ten it's something. Once started, I'm determined to hang on as long as I can. I don't diet, but I do watch what I eat a little bit. I get my rest in bed and I catnap. With me it's a matter of how you look at things (Amy, East-town).

Amy's motivation for physical activity contrasted sharply with that of Bradley, also a resident of East-town:

I think you can't make people do what they don't want to do and physical disabilities do determine plus the person's discipline and drive. If I was training for something, then I would get involved in [physical activity], but in retirement you don't have that same kind of motivation to stay fit. We enjoy life. We know that the death rate for humans is a hundred percent, so we're all going to die of something sooner or later and we're not trying to hold back that thing (Bradley, East-town).

Older adult residents of West-town also expressed the sentiment that their participation in LTPA was the result of personal motivation. Typical responses included,

The only limitation on what I do is what I want to do and making myself do it. If it's a cold day I think 'oh I won't bother today'. I don't always bother, but I do try to keep physical activities going just from a health point of view really . . . I don't think there's anything that prevents me. The only thing that might prevent me being more physically active is myself (Bernice, West-town).

My time is in making things and mending things and thinking about problems. My leisure time is not so much physical. I've never had to worry about my weight; I burn off the energy in nervous activity, not physical activity . . . If I was standing on a bowling green, I'd be thinking about all of the other things I'd be wanting to do, so I'd just get impatient (Michael, West-town).

The comments made by respondents from East-town and West-town showed that interest and motivation were important influences on older adults' LTPA participation in both neighbourhoods. Older adults interviewed in this research indicated that they made informed choices about their LTPA participation based on their interest or personal motivation and felt justified with their activity choices and level of involvement.

#### **4.4.1.3 The availability of an activity partner or group**

Aside from the intrapersonal influences of health and interest and motivation, East-town and West-town respondents also identified that other people were important determinants of their LTPA participation. The presence of other people with whom to be active was talked about as being associated with participation in LTPA. East-town resident, Sid, commented about how being part of group provided an incentive to be physically active:

I'm thinking about going into one of these walking groups. You can do more in a walking group than you can do on your own (Sid, East-town).

Lorraine, also from East-town, felt that not having an activity partner available constrained her LTPA participation:

Well it is just a lack of friends to go with. When I was a bit younger I used to go out walking with a woman there on the front flat, but I'm too old now to think of all those things (Lorraine, East-town).

Similar perspectives were raised by West-town residents. Reggie spoke about how the loss of a spouse influenced his LTPA participation:

Are you taking into account in your study the situation of widows and widowers and how the loss of a spouse affects leisure? For instance, when my wife was alive we used to walk together a lot and do so many other things. The point I'm trying to make is that once you've lost your partner, your situation changes quite dramatically and affects your life in lots of ways (Reggie, West-town).

The comments made by older adult respondents from East-town and West-town suggested that having a group, friend or spouse to be active with encouraged LTPA participation and not having anyone to be active with acted as a constraint to participation.

#### **4.4.1.4 Traffic**

In addition to the intrapersonal and interpersonal influences on older adults' LTPA participation reported by respondents from East-town and West-town, there was also a common environmental influence: traffic. The presence of traffic within one's neighbourhood was mentioned by residents from both East-town and West-town as a hindrance to LTPA. The main problems associated with traffic were the noise, smell and speed of the vehicles, which older adults regarded as offensive and dangerous. The traffic did not always deter older adults from participating, but it did influence the direction, timing and enjoyment of LTPAs, particularly neighbourhood walking. East-town respondents commented,

At the top of that road, it's murder to try and cross that road and I don't think the Council can do anything about it to be honest. I try to never walk up that road if I can help it. I always go down the other way. I would walk there, but that road is very dangerous (Andrea, East-town).

The only thing I don't like is the traffic. In the past, I've fought to get things right. It was my hard work that got the lights down here . . . It's the noise and a lot of these boys who like to put their foot down and come around that corner and scream past here. It's bad enough with fire engines, ambulances and police cars. I just go in my bedroom and hide. Even walking along the streets, something can come up behind me and just about send me over the fence (Pam, East-town).

The problem of traffic for older adults seems to be a widespread phenomenon in urban Christchurch. Comments made by residents of the more affluent West-town neighbourhood indicated that they also found the presence of traffic an unwelcome annoyance during their LTPA. Comments made by West-town residents included the following:

Traffic is a bit off-putting. If you walk up Idris road when they're head to tail and everyone's got their motors idling and it's a cold frosty morning you can breathe in huge concentrations of exhaust fumes. So traffic can be a problem at certain times of the day (Patrick, West-town).

There's a very busy thoroughfare around here. I personally don't like walking on the footpath around here because of the noise from the traffic. I find it disturbing (Nanette, West-town).

Although traffic was not reported to be a significant restriction to older adult LTPA, it was a nuisance that reduced the enjoyment of neighbourhood walking and forced older adults to carefully select the time and route of their walk. Thus, it seems that traffic was a common concern for older adult residents of urban Christchurch irrespective of their neighbourhood of residence.

#### **4.4.2 Divergent themes**

Although there were a number of common intrapersonal, interpersonal and environmental influences on older adults' LTPA participation reported by East-town and West-town respondents, there were also considerable differences between the two neighbourhoods. In general, East-town respondents spoke negatively about their local leisure environment and felt that the physical and social characteristics of their neighbourhood constrained LTPA participation. East-town residents commented specifically about a perceived lack of leisure provision, unattractive leisure settings and perceived exposure to crime and antisocial behaviour. Conversely, West-town respondents spoke favourably about their local leisure environment and felt that the physical and social characteristics of their neighbourhood facilitated LTPA participation. West-town residents commented specifically about a well-served and appropriate leisure environment, attractive and walkable surroundings and responsible residents. The distinct themes that emerged from the East-town interviews are presented first, followed by the themes for West-town.

##### **4.4.2.1 East-town**

###### **4.4.2.1.1 A lack of appropriate provision**

Many of the East-town respondents felt that their neighbourhood lacked the appropriate types and quantity of leisure provision for them to be more physically active. Specifically, residents perceived that their neighbourhood had a lack of facilities, was constructed primarily for young people and lacked suitable facilities close to home. Regarding a lack of provision, East-town respondents commented,

I don't think [the neighbourhood leisure environment] is any good at all. I honestly don't. Where could you go other than to go sightseeing at the shops? You can get on a

bus and go other places and the bus stops are handy, but apart from that, there's nothing (Noeline).

It's not overly well endowed really. You've got plenty of open spaces, but from a physical activity point of view it could do with a big community swimming and leisure centre. We've got Aqua-gym, but that's for top-line swimmers. It's not a pool for us to go to (Ted).

The comment which follows suggests that not only was East-town perceived to be lacking leisure provision, but that other parts of Christchurch were perceived by East-town residents as having better provision:

There's nothing around here and no one seems to be very interested. There aren't any churches or walking groups that can try to promote [physical activity] . . . I would [be more active in a different neighbourhood] because some areas have got better facilities. You head over to Fendalton and they've got some nice parks over there, but I can't afford to live over there (Nick).

A number of East-town residents also felt that their neighbourhood leisure environment catered mainly for younger people while neglecting the needs of elderly residents. It was evident from the comments of these respondents that older East-town residents felt marginalised in their own neighbourhood leisure environment:

I think [the neighbourhood leisure environment] could be improved. There are not a lot of activities, to my knowledge, in the area for older people. What activities there are, are basically for younger people (Ruth).

I think we're not as well served as some communities are in Christchurch. I just think there are some things, you know, there doesn't seem to be the same number of options, walking groups and stuff like that, for people who are elderly. Mostly, we're not really an elderly area (Bradley).

Pam was particularly scathing in her appraisal of the East-town leisure environment and felt that local leisure providers were not supplying many of the fundamental elements that older adults required to be active in their neighbourhood:

They're not including us! They're more concerned about the young people, what they've got. They've got skate parks and all sorts of things they're planning for them, but they're not planning anything for us . . . A nice half-circle seating area, something like that, to watch, because I love watching children play, even on those skate things, but you can't be involved because of our age. We know that, but just to be able to see something. Why do we have to be cut out? Why do they think we're that old that we can't even sit on a seat and enjoy a park? We can! We were young like that once too.

We didn't have those skate things, but we used to tear up and down on our bikes and things like that. We're not all that old; we're young at heart (Pam).

A perceived lack of services and a feeling that the leisure environment was built for younger people also meant that older adults perceived that many of the appropriate leisure settings were too far away for them to use. The tyranny of distance weighs heavy upon older adults whose circle of activity constricts with age. For those who could not drive, walking distance becomes very important in terms of being able to access leisure services and facilities. East-town respondents commented,

You need a car to go anywhere. The distances to anywhere are too far. I'm too old to drive a car and I'm too old to walk long distances, so whatever is available is out of my reach (Lorraine).

We need some closer things because I don't have a car . . . There are things here, but we could do with more [leisure] services and facilities (Jackie).

There's not really much to see here; although, the parks, they're quite nice, but not for many people who cannot walk that far (Sally).

The perception that East-town was not well supplied with resources for LTPA was a dominant theme expressed by many older adult respondents. It should be noted, however, that a smaller number of older adults in East-town considered the level of provision to be acceptable. While these individuals were in the minority, their point of view is important because it suggests that a lack of provision is not a universal constraint to LTPA participation and that there may be some parts of East-town where leisure provision is more accessible. Lenny and Edward separately commented,

Where we are here in Worcester Street you're quite handy to a number of things and the bus, so it can take you if you want to go out to swimming pools, cricket facilities, tennis courts. It's really on our doorstep. It depends on how active you want to be (Lenny).

For leisure activities, there are plenty of opportunities and there is Aqua-gym down the road. I have tried that. I've been swimming there. We don't go so much now, but we have been there. I keep well away from the gymnastic side, but I like the swimming (Edward).

Although there was some difference of opinion relating to the availability and accessibility of leisure provision in East-town, the overwhelming majority of respondents who

were interviewed felt that the leisure environment was insufficient to encourage them to be more physically active in their neighbourhood.

#### **4.4.2.1.2 An unattractive environment**

In addition to a perceived lack of appropriate provision, many of the East-town respondents felt that their neighbourhood environment was unattractive, which deterred them from participating in LTPA. Older adult residents were specifically troubled by the presence of litter, graffiti and the poor condition of homes and gardens in East-town. A number of respondents felt that the visual problems that characterised East-town were distractions and deterrents to neighbourhood walking in particular. When asked if there was anything about the neighbourhood that influenced her LTPA participation, East-town resident, Andrea, remarked,

I have a great complaint to make: litter. Litter's very bad. That's what I hate to see. It gets me cross because City Care put all that grass and the footpath and people come and put all their litter there. When you go for a walk it's awful to see that, and I feel it's a garden city. Surely something can be done. It's just something that you notice when you go for a walk and you don't like to see it (Andrea).

Cynthia was similarly concerned by the litter and also commented about other aspects of neighbourhood degradation that deterred her from walking in East-town:

This particular neighbourhood is not attractive at all . . . It's not a nice neighbourhood to walk in: the graffiti, the litter, just not a nice area. I would go out of this area to go for a walk. I wouldn't walk in [East-town] or in this particular area that I live in because of the graffiti and people not taking care of their gardens . . . Visually, it's not a pretty place. Older adults have got to the stage where they want to see things that look nice (Cynthia).

Cynthia's insightful comments were confirmed by the researcher's own experiences of walking the streets of East-town during the data collection phase of this research. The neighbourhood is flanked to the south-west by a large industrial area, which is characterised by bare footpaths, featureless buildings and warehouses, and a conspicuous lack of flora. Many of the streets in the residential parts of East-town are also rather featureless and punctuated by high fences, billboard advertising, discarded food wrappings, dilapidated shop fronts, unkempt lawns and gardens and general wear and tear in the housing stock. Many of the older adult respondents were particularly concerned by the poor condition of the many



rental properties in East-town and by the disregard shown by absentee landlords. Typical comments included,

Over the last 20 years this whole area has been run down pretty badly. I'm disappointed about it because we have lived here for a long time and we have seen many landlords who just don't care about anything at all . . . [Our neighbours] put a chainsaw in the back door to make a cat flap and the landlord doesn't give a damn . . . He never comes near the place, yet he holds out his hand for rent (Neville).

How can they live there? Even the police said that a dog wouldn't even live there. That's how bad it is . . . It was different in the first 25 to 30 years. It was quite alright even being an old place. The landlords looked after the houses better and the flats themselves, but now they can't get any better people in there because no one wants them (Sally).

Based on the respondents' comments, it appears that physical environmental factors such as litter, graffiti and the ramshackle appearance of many of the streets and houses in East-town reduced the aesthetic quality of the neighbourhood and acted as a distraction and deterrent to LTPA in general and neighbourhood walking in particular.

#### **4.4.2.1.3 Crime and anti social behaviour**

In addition to the physical environmental problems that plagued East-town, there were also a number of perceived social problems which conspired to constrain the LTPA participation of older adult residents. The majority of East-town respondents reported that they were often exposed to crime and antisocial behaviour and this made them feel vulnerable and less inclined to be active in their neighbourhood. Respondents typically raised the issue of crime and antisocial behaviour at the end of the interview when asked if there was anything else about their neighbourhood that influenced their participation in LTPA.

Perceptions of neighbourhood crime were particularly troublesome for older adult residents of East-town as these inculcated a tangible fear of the streets. Crime was experienced either directly in terms of being a victim of crime, or indirectly in terms of regularly encountering police or hearing about crimes occurring in close proximity to one's home. Burglary and vandalism were among the crimes that older East-town respondents reported most often during the interview. Typical comments included,

I've had a couple of break-ins. I left this back door open and a joker came in and relieved me of my wallet and what have you. Then another bloke came in and he jumped off his bike at the front door and came in – 'Oh, is Jack about' – sort of style, and I was in the toilet, but in the interim he'd taken my wallet (Craig).

When we first came here about thirteen years ago we had a lot of trouble. My partner had his car broken into two times. There was lots of trouble. There was lots of graffiti. I didn't like it at all. I didn't like the street. I used to say to everybody, 'Please lift the place and put it in another area', because I love this actual flat and there was a rough element . . . There was a time when they tried to get in through the windows and now I lock everything because I'm scared. There was a bar they dropped, a steel rod, which they had tried to pry the window open with (Alice).

Even when East-town residents were not victims of crime, they were often acutely aware of the social problems that existed in their neighbourhood and perceived the neighbourhood to be an unsafe place. Nick recounted some of East-town's problems:

Well, there have been cases of people being molested in [East-town] Park just recently. And then there's, in this street, been dealing in drugs in these flats here. It doesn't affect me, but it's around (Nick).

The perception of crime was augmented by a high police presence. Older East-town residents found the presence of police to be unsettling because they associated it with social problems in their neighbourhood. Eunice and Nancy independently commented,

There's a bad crowd around here. There's always police around. The flats here are okay because they're all ownership flats, but the two lots across the road they're all rented. Not that I've ever had any trouble, but about three weeks ago we had the police and the armed offenders squad chasing a couple of guys down the driveway and over the fence. Nobody knew what was going on. That's the sort of thing you've got to expect (Eunice).

We've had a couple of burglaries around here recently and that sort of scares you a little bit. Too close to home. That flat in that section over there got done the other day. We had police dogs and God knows what around here. It scares you a bit (Nancy).

In addition to perceptions of crime, many of the East-town respondents reported that they had been exposed to antisocial behaviour in their neighbourhood. Antisocial behaviour was discussed by older adult respondents mostly in terms of untrustworthy and intimidating neighbours. Such behaviour made a number of older adults feel trapped in their homes and afraid to be active in their neighbourhood. Nancy and Sally separately commented about

being intimidated by their neighbours and feeling uncomfortable about going out in East-town:

I've got one empty house on one side of me. It did have about eight skinheads in it. You walk out the back door and they say, 'There's the old girl' or 'There's nanny' or 'There's grumpy'. We never spoke. It was just ignorance. They couldn't help it. The lady in the front flat had stones thrown through her front window and stuff like that with the people who were living next door (Nancy).

If you want to go out during the day, especially when you have bad people next door, you're frightened to leave, especially if they're all on the road talking and drinking. You think, 'Once they see us going it's open for them' . . . One thing you don't want in this neighbourhood is to get all the neighbours together. That would be the worst thing because everybody would know when you're gone. The police often talk about neighbourhood groups and this and that, but not in this area. You're asking for trouble if you do that. So if you have to have to go somewhere you hope nobody will see you and you take off (Sally).

When older East-town respondents ventured away from home and into their neighbourhood, they were often faced with a hostile social environment which reinforced their unfavourable perceptions of the neighbourhood. Edward commented about his experiences of hostile neighbours and fearsome dogs:

Walking around the district you've got to be fairly careful. My wife was in a singing group and I had some pamphlets to deliver and you have to be careful where you deliver because I just walked around the block and in the small area I walked in I must have had three or four complaints: 'Hey what are you doing', 'Don't leave that rubbish here' and so forth. Even when I take the dog for a walk you get odd dogs tearing up to the fence and annoy you and so forth. There are some vicious dogs in the area you've got to be weary of. You do have to be careful to keep out of trouble when you're walking around the area (Edward).

Not all of those who lived in East-town were adversely affected by crime and antisocial behaviour. Comments made by Bradley and Guy were typical of those who felt that crime and antisocial behaviour were no worse in East-town than in any other neighbourhood in Christchurch:

We don't find it's a bad area. We certainly don't think it's a bad area in terms of crime. We do have our fair share of sirens going up the road at times, but usually they're in transit to somewhere else (Bradley).

We have a bit of crime down here, but I think we have it all over Christchurch and I don't think it's any worse than anywhere else. People used to give [East-town] a bad name, but I have never had any problems here, none at all (Guy).

These statements, however, should be viewed with some reserve as they represented a minority opinion expressed by only a few older adults who lived in the northern part of East-town. Residents of other areas of East-town, particularly those who lived near the large industrial area to the south of the neighbourhood, were far more critical of their social environment. The general perception that emerged during interviewing was that East-town was characterised by an increased exposure to crime and antisocial behaviour relative to other parts of Christchurch. Although none of the East-town respondents explicitly referred to crime and antisocial behaviour as deterrents to LTPA, many older adults commented that these factors made them frightened of their surroundings and less inclined to leave home and venture forth in their neighbourhood. Thus, it seems that worries about crime and untrustworthy and intimidating neighbours may discourage certain types of LTPA, such as neighbourhood walking, which could bring older adults into confrontation with other neighbourhood residents.

#### **4.4.2.2 West-town**

In contrast to the problematic physical and social environment reported by older adults in East-town, which appeared to constrain LTPA participation, West-town respondents spoke positively about their neighbourhood environment and considered it to be conducive to LTPA participation. West-town respondents identified a number of aspects of their physical and social environment that facilitated increased involvement in LTPA. These included a well-served and appropriate leisure environment, attractive and walkable surroundings, and responsible and trustworthy residents.

##### **4.4.2.2.1 A well-served leisure environment**

In contrast to East-town respondents, the West-town residents who participated in this research felt that their neighbourhood leisure environment was well provided for, that it suited the needs of older adults and that they were fortunate to live in such a well-resourced part of Christchurch. Indicative comments from West-town respondents included,

It's very well served. We're very lucky. There's bowls, croquet, tennis. There are parks for children, and there's a nice path along the railway line for walking. We're really very well serviced (Sandra).

I think it's probably well served. You know, there's bridge clubs and there's bowling greens and you can walk along the streams that go through. Parks down this end and parks over here. I think we're well served (Penelope).

The facilities are attractive in the sense that they attract you. Not that they are beautiful because in many cases that is there anyway, but attractive because they appeal to what you want to do (Norris).

West-town respondents perceived that they were better off, in terms of leisure provision, than other parts of the city and were grateful to live in such a well-served neighbourhood. The following comment from Wendy revealed a deep sense of appreciation for her neighbourhood leisure environment:

I think we're better off than a lot of areas, but then you see I've got a back gate into the park and directly over my back fence is croquet and the Canterbury Centre for bowls. You go straight in and you've got the park for football and kids going over there flying kites and doing all the bits and pieces that they like to do and running wild generally; the stream that runs through it, and the ducks. I feel very blessed here. On the other hand, you go up the road and St Barnabas [an old, attractive, stone church with ample grounds] has got lovely trees and so forth. You just look out continually and you've got a mass of different kinds of birds and you've got all the different coloured trees. (Wendy).

Linda was more pragmatic in her appraisal of the neighbourhood environment, but similarly recognised the superior leisure provision that was afforded to the residents of West-town:

The City Council seems to spend more money in this area to beautify it; more than in the other side of town. The footpath gets repaired more quickly. If there's anything that needs done, it gets done quicker here than in any other area. Other places are a little neglected, so it's a pleasure to walk here. Unfortunately that's how it goes isn't it (Linda)?

West-town respondents perceived that there was an abundance of appropriate and high-quality facilities for older adults in their neighbourhood which led them to hold their leisure environment in high esteem and contend that they were well served, especially in comparison to other parts of Christchurch.

#### 4.4.2.2 Attractive and walkable surroundings

In addition to providing a well-served and appropriate leisure environment for older adults, West-town respondents perceived that their neighbourhood was highly attractive and that the unique aesthetic qualities of the local leisure environment encouraged walking for LTPA, in particular. Valued aesthetic qualities of the neighbourhood environment included the presence of colourful and established trees; attractive parks; pristine, tree-lined streets; and well-maintained homes and gardens. Typical comments made by West-town respondents included,

I think it's most attractive. We like it here. It's pleasant, it's colourful, it's easy to walk around and we seem to have met a lot of nice people while we've been doing it. For our modest needs, walking around and enjoying the flowers, trees and so on, yes, I think it satisfies us very well (Alf).

We're very lucky here. Mona Vale [an historic homestead and gardens administered by the City Council] is five minutes walk from here. There are beautiful parks in this area. I think we are very fortunate. As long as you can get out and walk, there are beautiful walks in all directions. From that point of view, I guess walking is the only physical activity that I do in this area, but I think there's huge scope for very good walks (Crystal).

In line with comments made in relation to the appropriate and high quality leisure provision, West-town respondents also felt that the aesthetic quality of the walking environment in their neighbourhood was superior to other parts of Christchurch. Michelle and Patrick separately commented,

I think we're very lucky really. We've got streets that are pleasant to walk on. I can think of other areas in Christchurch where the streets are very dull, whereas the roads up here around [West-town] are quite attractive to walk along (Michelle).

The only physical activity I do in the neighbourhood is walking, and for that it's fine. If you walked in industrial areas in the south of Christchurch it would be pretty bleak, but it's pleasant here and there are gardens to look at (Patrick).

In a completely unprompted statement, Penelope contrasted the attractive and walkable neighbourhood leisure environment in West-town with that of East-town, which she considered to be less attractive and less walkable:

I wouldn't be particularly fussed going out in some of the areas. I walk here because it's pleasant and there're lots of trees and all the rest of it. If I lived in [East-town] I wouldn't be walking around a great deal I think. The area's not kept as well and so forth. I'm not knocking that because there're lots of nice people in [East-town], but it is an area for the less fortunate, some through their own fault some not though their own fault, but it doesn't encourage me to go walking around the streets (Penelope).

Thus, it is evident that West-town respondents perceived their leisure environment to be highly attractive and conducive to walking for LTPA. The presence of attractive streets, gardens and parks appeared to facilitate neighbourhood walking, and older adult residents of West-town perceived the aesthetic quality of their neighbourhood as superior to other areas in Christchurch.

#### **4.4.2.2.3 Responsible residents**

In addition to an activity-friendly physical environment, West-town respondents also felt that the neighbourhood social environment was conducive to LTPA participation. Many of the West-town respondents who were interviewed during this research believed that their neighbourhood was conducive to LTPA because the social environment provided more incentives and fewer deterrents to activity. The social environment in West-town was perceived as conducive to older adults' LTPA because neighbourhood residents maintained their homes and gardens to a high standard, did not disturb or interfere with other residents, and generally appreciated living in the area and looked after the local leisure resources and facilities. Jack commented,

I think we live in a very desirable and extremely pleasant part of Christchurch. Plainly speaking, people take care of their gardens and they plant trees and so on. If you've been driving through Christchurch and you come to this area, there're far more trees and it's more wooded than other suburbs, so I think we're extremely fortunate to have such pleasant surroundings (Jack).

A number of the respondents also expressed the opinion that West-town residents were more responsible than people who lived in other parts of Christchurch. Penelope and Sandra separately commented,

I think it's appreciated by the people who live in it, so, therefore, it is a worthwhile place to continue to have these sorts of parks and reserves because they're well looked after and people appreciate them. They're the sort of people that appreciate this sort of thing and they look after it. In some of the other areas, there's all sorts of factors in

people's lives, the more deprived folk. They probably would appreciate it, but there would be a lot of negatives in the way of damage and that sort of thing (Penelope).

I probably wouldn't go walking [in some parts of Christchurch]. Most people around here have dogs and they walk their dogs on leashes, and I know it sounds uppity and snobby, but people in this area are more responsible for themselves and consider other people. Even if people are out walking with big dogs, they are on leashes. It's not an area where they have mastiffs and pig dogs and those human-attacking dogs. I wouldn't [walk] in some areas of the city (Sandra).

It is evident from the above comments that West-town residents considered their social environment to be more conducive to LTPA participation than other parts of Christchurch. In support of this, and in contrast to the findings from East-town, crime and antisocial behaviour were viewed as relatively minor problems in West-town. Respondents made the following comments:

Crime, thank goodness, I'm not aware of that. The only thing I've noticed a bit of deterioration in, in the last two years or so, is the greater number of younger people walking around and incidental vandalism. I had the mail box pushed over at one stage and the milk stolen on a couple of occasions, just minor sorts of things. I gather it is minor compared with Christchurch as a whole, so we're lucky (Adam).

There has been the odd small burglary, but that's usually kids looking for money. I don't recall anything major. Generally, it's a desirable area (Reggie).

Crime and antisocial behaviour were not a significant issue for West-town respondents and did not appear to adversely impact on older adults' LTPA participation. Despite low perceptions of crime and antisocial behaviour, residents of West-town expressed concerns about a general lack of social interaction in their neighbourhood. A number of the older adult respondents commented that local residents lived intensely private lives behind tall fences and made little attempt to get to know their neighbours. Indicative comments included,

The neighbourly business is not good. They've all put locks on their gates and you've got to know the number if you ever want to call on them. That's very sad because I know the level of crime has risen, but you can still have your house secure or you can have a voice thing at the gate or something (Penelope).

The disadvantage in an area such as this is that we do tend to live behind our fences and in our own environments and we don't congregate as a neighbourhood very often at all. We all live our own private lives, which possibly isn't a good thing (Crystal).



It was unclear whether a lack of neighbourliness had any impact on LTPA participation, but the above comments suggest that West-town residents perceived some room for improvement in their social environment. In general, though, West-town respondents were satisfied with the social conditions of their neighbourhood, which they recognised as being more conducive to LTPA participation than many other parts of Christchurch.

#### **4.4.3 Summary of semi-structured interview findings**

The results of the semi-structured interviews, conducted with older adults from the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town, suggested that there were a number of similarities and differences in the perceptions of LTPA. For older adults in both neighbourhoods, health status, interest and motivation, the availability of an activity partner or group, and the presence of traffic were commonly reported influences on LTPA participation. In the high-deprivation neighbourhood of East-town, respondents generally spoke negatively of their neighbourhood environment and felt that it presented many physical and social constraints to LTPA participation. Neighbourhood problems highlighted by East-town respondents included a perceived lack of appropriate leisure provision, an unattractive neighbourhood environment and perceived exposure to crime and antisocial behaviour. On the other hand, respondents from the low-deprivation neighbourhood of West-town were more positive about their neighbourhood environment and felt that it facilitated LTPA participation. Positive neighbourhood characteristics highlighted by residents of West-town included appropriate and high-quality leisure provision, attractive and walkable surroundings, and responsible and trustworthy neighbourhood residents.

The next chapter presents a discussion of the findings from each of the three methods of enquiry and identifies how they contribute to answering the primary research question. Chapter Five also attempts to integrate all of the findings into a coherent model illustrating how neighbourhood deprivation influences older adults' LTPA participation.

## **Chapter Five: Discussion and integration of findings**

### **5.1 Chapter introduction**

This research explored how neighbourhood deprivation influenced older adults' leisure time physical activity participation. Three research subquestions were posed to address the main research problem, and three methods of enquiry were employed to address the different subquestions. The methods of enquiry consisted of a recall survey, Q method and semi-structured interviews. This chapter discusses and integrates the findings from these three methods of enquiry. It begins with a discussion of the results derived from each of the three methods that were applied in this research and how they relate to previous research findings and the primary research question. The various research findings are then integrated into a single ecological model which attempts to answer the primary research question.

### **5.2 Recall survey findings: Patterns and prevalence of LTPA**

#### **5.2.1 Discussion in relation to previous research**

A recall survey was employed in this research to identify the patterns and prevalence of LTPA among older adults who live in neighbourhoods of high and low deprivation. The recall survey also contributed towards an overall understanding of how neighbourhood deprivation influences older adults' LTPA participation. Analysis of the survey data showed that older adults from the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town had similar patterns, in terms of types and settings, of LTPA, but that respondents from West-town were more active within their neighbourhood and out of their neighbourhood than respondents from East-town. The results also showed that health status, sex and neighbourhood deprivation were all significantly associated with older adults' LTPA participation.

In both of the neighbourhoods under investigation, the most commonly reported types of LTPA were walking, home exercise and gardening. These findings are consistent with those of other leisure and physical activity surveys that have been undertaken in New Zealand, which have identified walking and home-based activities as among the most popular types of LTPA for older adults (Galgali et al., 1998; Sport and Recreation New Zealand,

2001). The international leisure and epidemiological literature has consistently identified walking as the most popular form of LTPA among older adults (Lian et al., 1999; Lietner & Lietner, 2004; O'Brien Cousins, 1997). The World Health organisation (1998) has argued that walking is the most convenient form of LTPA for older adults to undertake because it is low cost, inherently safe, low impact, requires no special skills or equipment, is self-regulated in terms of intensity and duration, and can be performed by most elderly people.

In addition to similar types of LTPA, the most commonly reported leisure settings among East-town and West-town respondents were home and neighbourhood. Overall, home was the most popular setting for LTPA, but neighbourhood also emerged as an important context. Comparatively little LTPA was undertaken outside of the neighbourhood environment by respondents from East-town and West-town. These findings are consistent with the international leisure and epidemiological research which has identified that the majority of leisure activities that older people engage in take place at home or in close proximity to home (Harrington, 2006; King, 2001). Common preferences for home and neighbourhood as sites of LTPA participation may be related to the fact that older adults' leisure activities are usually undertaken with family or close friends, or due to the geographical constriction in the sphere of leisure activity that occurs in later life as a result of decrements in health, mobility and income (Harrington, 2006; Kelly, 1996).

Older adults from the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town had similar patterns of LTPA, which appeared to be unaffected by neighbourhood conditions. Common preferences for walking, gardening and home exercise and for home and neighbourhood as sites of LTPA suggest that there is some homogeneity in LTPA tastes in both high- and low-deprivation neighbourhoods. These findings support Kelly's (1996) concept of the leisure core which contends that older adults prefer activities that are low cost, close to home, convenient and accessible. Because the patterns of LTPA participation appeared to be similar among older adult respondents from East-town and West-town, it seems likely that the environmental attributes of each neighbourhood had a relatively insignificant influence on the type and setting of older adults' LTPA participation. The patterns of LTPA participation among older adults' may be influenced to a greater extent by intrapersonal and interpersonal factors. This is congruent with the traditional focus on the individual and their relationships with significant others which has prevailed in epidemiological theory and research for the past 20 years (Ajzen, 1985; Becker, 1974; King et al., 2002).

Despite comparable patterns of LTPA, *t* tests revealed notable differences in the prevalence of LTPA between East-town and West-town. There were statistically significant differences in the prevalence of neighbourhood LTPA and out of neighbourhood LTPA between the East-town and West-town samples. There was, however, no significant difference in the prevalence of home-based LTPA between the two neighbourhoods. The results showed that older adults from the low-deprivation West-town neighbourhood participated in LTPA within their neighbourhood and outside their neighbourhood more frequently than older adults from the high-deprivation East-town neighbourhood. Differences in the prevalence of neighbourhood LTPA between East-town and West-town respondents suggest that there may be disparities in aspects of the neighbourhood environment which influence LTPA participation. The neighbourhood environment may be more conducive to LTPA in West-town and more restrictive to LTPA in East-town. This assertion is reinforced by a small number of international research findings which have demonstrated that neighbourhood deprivation is associated with reduced LTPA participation among adults and that this outcome appears to be mediated by deleterious physical and social environmental conditions (Giles-Corti & Donovan, 2002b; van Lenthe et al., 2005; Yen & Kaplan, 1998). Differences in the prevalence of out of neighbourhood LTPA suggest that older adults from the low-deprivation neighbourhood of West-town may have more financial and transportation resources to allow them to access leisure settings that are outside their neighbourhood. In contrast, respondents from the high-deprivation neighbourhood of East-town may lack the necessary resources required for them to access leisure settings beyond their neighbourhood. Similarities in the prevalence of home LTPA imply that the home environment may be a universally accessible leisure setting for older adults in neighbourhoods of high and low deprivation and conducive to LTPA participation.

Following the *t* test results, multiple regression analysis revealed that health status, sex and neighbourhood deprivation were significantly associated with the total frequency of LTPA among the older adults who participated in this research. The analysis showed that those who had no medical conditions or disabilities participated in LTPA more often than those who reported having a medical condition or disability, older men participated in LTPA more frequently than older women, and older adults who were living in the low-deprivation neighbourhood of West-town participated in LTPA more often than older adults who were living in the high-deprivation neighbourhood of East-town. Numerous studies undertaken within the physical activity epidemiology paradigm have found that good health and functional ability are associated with greater participation in LTPA and that poor health and

disability are associated with reduced participation (Crombie et al., 2004; Kaplan et al., 2001; Lim & Taylor, 2005; O'Clark, 1999; Sport and Recreation New Zealand, 2003). Poor health and disability may limit an older adults' capacity for and enjoyment of LTPA, and considering the potential for exacerbating existing medical conditions, physical activity might be deliberately avoided by individuals who are suffering from an illness or disability (O'Brien Cousins, 1997). Previous epidemiological research findings have also shown that older men usually participate in LTPA more often than older women (Kaplan et al., 2001; Lim & Taylor, 2005; O'Brien Cousins, 1997). The disparity in LTPA participation between older men and older women may be due to the fact that the current generation of older women were not socialised into physically active forms of leisure to the same extent as older men (Grant, 2002; Harahousou, 2006). Older women also tend to have more housekeeping and care giving responsibilities than older men and their leisure and work is often intertwined, which generally leaves them less time available for LTPA participation (Harahousou, 2006; O'Brien Cousins, 1997). The results which showed that neighbourhood deprivation was associated with reduced LTPA participation among older adults are consistent with the findings of research undertaken among the general-adult population (Giles-Corti & Donovan, 2002b; van Lenthe et al., 2005; Yen & Kaplan, 1998). This study, however, is among the first to establish a potential association between neighbourhood deprivation and older adults' LTPA participation.

### **5.2.2 What do the recall survey findings contribute to an understanding of how neighbourhood deprivation influences older adults' LTPA participation?**

The results of the recall survey suggest that neighbourhood deprivation has little, if any, impact on the patterns of older adults' LTPA participation, but that it does have a significant influence on the prevalence of LTPA. High neighbourhood deprivation appears to be associated with reduced participation in overall LTPA and, in particular, neighbourhood and out of neighbourhood LTPA. Essentially, the results suggested that older adults from neighbourhoods of high and low deprivation undertake the same types of activities in the same general settings, but that respondents who were living in the low-deprivation neighbourhood of West-town participated in LTPA more frequently than respondents who were living in the high-deprivation neighbourhood of East-town. This finding implies that characteristics of neighbourhood environment may constrain LTPA participation in the high-

deprivation neighbourhood of East-town and facilitate LTPA participation in the low-deprivation neighbourhood of West-town. The intrapersonal factors of health status and sex were also identified as significant influences on older adults' LTPA participation, and male sex and good health were identified as being associated with a higher prevalence of LTPA participation. These findings suggest that there are multiple levels of influence on LTPA behaviour in later life, as predicted by the ecological theories of behaviour change (McLeroy et al., 1988; Stokols, 1992), and that neighbourhood deprivation has a particularly significant influence on the LTPA participation of older adults.

### **5.3 Q method findings: Preferred leisure settings**

#### **5.3.1 Discussion in relation to previous research**

Q method was employed in this research to identify the kinds of neighbourhood leisure settings that older adults who were living in areas of high and low deprivation preferred. Preferred leisure settings are indicative of the kinds of neighbourhood locations that are most likely to be utilised by older adults for their LTPA. The findings arising from Q method also contributed to an overall understanding of how neighbourhood deprivation influences older adults' LTPA participation. To date, there has been negligible application of Q method in epidemiological and leisure research and this study is among the first to utilise this technique to explore older adults' preferences for neighbourhood leisure settings. The findings that emerged from the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town are now discussed in relation to the research literature.

In the high-deprivation neighbourhood of East-town, older adults preferred three diverse leisure settings that were characterised as Restful Nature, Functional Facilities and Social Interaction. The majority of respondents were loaded on the Restful Nature factor, which suggested that the presence of natural characteristics, such as public gardens and parks, were important aspects of older adults' preferred leisure settings. There was a clear distinction, however, between the Restful Nature factor and the other two factors that emerged from the East-town Q sort. Functional Facilities and Social Interaction were not oriented towards attractive, natural, leisure settings, but showed a preference for more utilitarian locations, including a gym, swimming pool, bowling green and neighbourhood shops. In comments made regarding their Q sorts, subjects who loaded on both Restful Nature and Social

Interaction indicated that they preferred walking for LTPA and leisure settings which had bench seating available, so that respondents could alternate walking and rest to make activity more manageable.

In the low-deprivation neighbourhood of West-town, older adults also preferred three kinds of leisure settings and these were characterised as Aesthetic Activities, Walkable Nature and Heritage Walk. Each of these factors exhibited an overt preference for attractive neighbourhood leisure settings. The particular features of neighbourhood leisure settings that were valued by older West-town respondents included historic buildings, boutique gardens, pristine streetscapes, native bush, and attractive parks and facilities. In comments made about their Q sorts, and in congruence with many of the East-town respondents, the overwhelming majority of those who loaded on each of the three West-town factors also indicated that they preferred walking for LTPA.

The preference for attractive, natural, leisure settings and the preference for walking for LTPA were common features of Q sorts undertaken in both East-town and West-town. Studies which have explored the determinants of LTPA among older-adult and general-adult populations have previously found a positive association between neighbourhood attractiveness and participation in LTPA (Giles-Corti & Donovan, 2002b; Michael et al., 2006; van Lenthe et al., 2005). Features of an attractive neighbourhood environment which have previously been identified as being associated with LTPA in general and walking in particular include well-maintained homes and gardens, neighbourhood cleanliness, interesting and diverse architecture, historical buildings and locations, curved streets, good neighbourhood design, and the presence of high quality green and open spaces (Giles-Corti & Donovan, 2002b; Michael et al., 2006; van Lenthe et al., 2005). In this research, however, the presence of nature was the only attractive neighbourhood characteristic that was universally valued by residents from both East-town and West-town. The popularity of leisure settings which facilitated walking as a form of LTPA among both East-town and West-town respondents is also congruent with the data derived from the recall survey and in line with the leisure and epidemiological literature, which has consistently identified walking as one of the most popular LTPAs for older adults (Lian et al., 1999; Lietner & Lietner, 2004; Sport and Recreation New Zealand, 2001). The commonalities that were evident between East-town and West-town suggest that there may be some homogeneity in the leisure tastes of older adults which are independent of neighbourhood of residence. The Q method results reinforce the

findings from the recall survey which showed that older adults had similar patterns of LTPA participation and that walking was a favoured mode of LTPA.

Although older adults from both neighbourhoods shared a preference for attractive, natural, leisure settings that facilitated walking for LTPA, respondents from the high-deprivation East-town neighbourhood also preferred more utilitarian locations. Given the emerging association between neighbourhood attractiveness and LTPA, preferences for utilitarian leisure settings that emerged from the East-town Q sort imply that this high-deprivation neighbourhood may be generally less attractive and, therefore, less conducive to older adults' LTPA participation. It is possible that a less attractive leisure environment would discourage certain types of neighbourhood activity, such as walking, and direct older adult residents toward more functional leisure settings as a substitute. This contention is consistent with an ecological perspective which posits that environmental factors influence individual behaviour by promoting certain actions, while discouraging or constraining others (Sallis et al., 1998; Stokols, 1992).

In contrast to the diverse preferences for leisure settings that were exhibited by East-town respondents, all of the factors that emerged from the West-town Q sort showed a distinct preference for aesthetically pleasing neighbourhood leisure settings. Considering that attractive leisure settings have previously been identified as conducive to LTPA participation, it seems plausible that the prevailing preference for such environments in West-town may indicate that this low-deprivation neighbourhood is more attractive and, therefore, more conducive to LTPA. Furthermore, all of the factors that emerged from the West-town Q sort showed a preference for walking and considering that this activity is among older adults' most preferred, it may be that a more attractive neighbourhood facilitates an increased prevalence of walking and overall LTPA. This assertion reinforces the finding of the recall survey which showed that older adults who lived in the low-deprivation neighbourhood of West-town participated in LTPA more frequently than those who resided in the high-deprivation neighbourhood of East-town.

It is possible that the preferences for utilitarian leisure settings that were encountered in East-town were unrelated to an unattractive neighbourhood environment, but instead associated with idiosyncrasies that were present within the sample. If this were true, however, it would have been expected that a more diverse range of leisure settings would have also emerged from the West-town Q sort. As this was not the case, it may be reasonable to infer



that there is an inherent difference in the aesthetic quality of the neighbourhoods and that the low-deprivation neighbourhood of West-town may be more attractive and more conducive to older adults' LTPA than the high-deprivation neighbourhood of East-town.

### **5.3.2 What do the Q method findings contribute to an understanding of how neighbourhood deprivation influences older adults LTPA participation?**

Q method systematically revealed the preferences for neighbourhood leisure settings that existed in the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. These preferences are indicative of the kinds of leisure settings that are likely to be utilised for LTPA by elderly residents in each neighbourhood. Analysis of the recall survey results previously established that neighbourhood deprivation appears to be associated with older adults' LTPA participation and that the respondents from the low-deprivation neighbourhood of West-town participated in LTPA more frequently than respondents from the high-deprivation neighbourhood of East-town. The Q method results suggest a potential pathway through which this neighbourhood effect may be mediated. On the basis of the preferences that emerged from the two different Q sorts, it seems that East-town may be a less attractive neighbourhood than West-town, evidenced by preferences for utilitarian leisure settings, and this lower level of attractiveness might be implicated in reduced LTPA participation in general and neighbourhood walking in particular.

Respondents from the high-deprivation neighbourhood of East-town preferred a diverse range of leisure settings. While many of the East-town respondents preferred leisure settings that contained attractive, natural elements, others preferred more utilitarian-type settings which may be less conducive to older adults' LTPA participation and, in particular, neighbourhood walking. In contrast, all of the respondents from the low-deprivation neighbourhood of West-town preferred aesthetically pleasing leisure settings which were associated with nature, heritage, and pristine streets and facilities. All of these attributes were regarded by West-town respondents as conducive to LTPA in general and to neighbourhood walking in particular. Thus, it appears that residing in a high-deprivation neighbourhood, such as East-town, may act a deterrent to LTPA for older adults by presenting a less attractive and more utilitarian environment which may constrain choice and opportunity and be less conducive to walking. In contrast, residing in a low-deprivation neighbourhood, such as West-

town, may facilitate older adults' LTPA by presenting an abundance of nature, heritage places and high quality infrastructure, which is more conducive to LTPA, particularly neighbourhood walking.

## **5.4 Semi-structured interview findings: Perceptions of neighbourhood LTPA**

### **5.4.1 Discussion in relation to previous research**

Semi-structured interviewing was used in this research to identify perceptions of neighbourhood LTPA among older adults who were living in high and low-deprivation neighbourhoods. Like the recall survey and Q method, semi-structured interviewing also contributed to an overall understanding of how neighbourhood deprivation influences older adults' LTPA participation. To the author's knowledge, this research is among the first to utilise the qualitative technique of semi-structured interviewing to explore the influence of neighbourhood deprivation on older adults LTPA participation. Analysis of the transcripts of the 63 semi-structured interviews conducted with older adult respondents from the high-deprivation neighbourhood of East-town and low-deprivation neighbourhood of West-town revealed a number of shared and divergent themes regarding the influences on LTPA. The shared themes addressed intrapersonal, interpersonal and environmental influences on older adults' LTPA participation; however, the divergent themes related exclusively to the physical and social environment. The shared themes are discussed first, followed by the divergent themes.

Health status and functional ability were identified by respondents from both East-town and West-town as important influences on LTPA participation. In particular, poor physical health and disability were viewed as constraints to participation, and common problems that were implicated in reduced LTPA participation included joint pain and weakness, breathing difficulties and chronic diseases. This result was in line with many previous epidemiological studies which have reported significant correlations between health status and older adults' LTPA participation (Crombie et al., 2004; Kaplan et al., 2001; Lian et al., 1999; Lim & Taylor, 2005). In New Zealand, the findings of a recent and large-scale physical activity survey showed that health was one of the most significant influences on older adults' participation and that the older a person is, the more likely they are to report health problems

as a constraint to physical activity (Grant et al., 2007). Interestingly, older adults from both neighbourhoods believed that decrements in health and functional capacity were a normal part of the ageing process which had to be accepted and to which they had to adapt. This finding is congruent with the Selective Optimisation with Compensation theory of ageing (Baltes & Carstensen, 1996) which would contend that illness and disability are a catalyst for older adults to reduce their levels of activity or alter their patterns of participation in order to maintain a sense of continuity and competence in later life. The influence of health on LTPA participation has also been predicted by the Health Belief Model (Becker, 1974) and Social Cognitive Theory (Bandura, 1986). The finding that health and functional ability influenced older adults' LTPA participation reinforced the recall survey results which also showed that individuals who reported good health status and functional ability participated in LTPA more frequently than those who reported having a medical condition or disability.

Interest and motivation were also perceived by respondents from both East-town and West-town as important influences on LTPA. In particular, high levels of interest and motivation were associated with participation in LTPA and low levels were associated with reduced participation or nonparticipation. A number of epidemiological studies have previously identified interest and motivation as determinants of older adults' LTPA participation, and those who have higher interest or motivation for LTPA are commonly found to have higher rates of participation (Crombie et al., 2004; O'Clark, 1999). Interest and motivation are also central components of the intrapersonal and interpersonal theories of behaviour change, including the Health Belief Model (Becker, 1974), Transtheoretical Model (Prochaska et al., 1992) and the Theory of Planned Behaviour (Ajzen, 1985). According to these theoretical perspectives, interest and motivation are precursors to LTPA participation. Many of the older adults who were interviewed as part of this research felt that interest and motivation were at the core of their LTPA behaviour and they emphasised that it was their choice to be as active or as inactive as they wanted to be. This perspective suggests that older adults' LTPA participation was based on an inherent enjoyment and satisfaction of activities, rather than on desires to improve health or to conform to the expectations of others. This is important because in the discourses on ageing, the perspectives of the older adult and their rights to choose for themselves and to not be judged for their choices, including choices to be inactive, are often overlooked.

The presence of an activity partner or a group was also identified as an important influence on LTPA participation for a number of older adults from East-town and West-town.

Older adults who were interviewed in this research felt that having a spouse, friend or an activity group available to be active with provided encouragement for LTPA, while not having others available constrained participation. The epidemiological literature has often found that interpersonal factors play a role in older adults' LTPA participation, and having an activity partner or group available has been identified as providing an incentive for older adults to be active (Booth et al., 2000; Crombie et al., 2004; King, 2001; McAuley et al., 2003). It is likely that the presence of others supports LTPA participation by providing verbal encouragement to begin and maintain LTPA and companionship during the performance of the activity (O'Brien Cousins, 1997). Social support is a feature the interpersonal theories of behaviour change, and the Theory of Planned Behaviour (Ajzen, 1985) and Social Cognitive Theory (Bandura, 1986) both regard social support as an important precursor to LTPA participation.

The final shared theme identified during the semi-structured interviewing was the presence of traffic, which was regarded as a distraction and a deterrent to LTPA by older adult respondents from East-town and West-town. In particular, it was the speed, noise and exhaust fumes emitted by urban traffic that older adults found off-putting in relation to their LTPA. This finding is reinforced by international studies which have identified that safety from traffic and safety of the pedestrian infrastructure are influences on older adults' LTPA participation (Booth et al., 2000; van Lenthe et al., 2005). Older adults are justifiably concerned about the dangers of traffic because they are among the most likely cohorts in New Zealand to be either injured or killed as pedestrians (Keall, 1995). Concerns that emerged in this research about the speed of traffic are analogous with concerns for safety that have previously been reported in the literature; however, the current research has extended the previous findings by suggesting that the noise and exhaust fumes associated with traffic may also deter older adults from participating in LTPA. The presence of traffic was the only aspect of the neighbourhood environment that emerged as a common influence on older adults' LTPA in both East-town and West-town, and it appears that traffic is a universal constraint for older adults in an urban environment. The finding that traffic appeared to influence older adults' LTPA participation supports ecological theories of behaviour change, which attest that environmental factors can constrain LTPA participation (Stokols, 1992).

The shared themes revealed that, in neighbourhoods of both high and low deprivation, there appeared to be a number of universal influences on older adults' LTPA participation. These influences included health and functional ability, interest and motivation, the

availability of an activity partner or group, and the presence of traffic. The shared themes that emerged from the semi-structured interviewing are congruent with the international research from within the epidemiological paradigm. They are also congruent with an ecological perspective, which acknowledges multiple levels of influence on older adults' LTPA participation (McLeroy et al., 1988; Stokols, 1992).

In addition to the shared themes, there were a number of divergent themes that were unique to the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. In general, East-town respondents had negative perceptions of LTPA in their neighbourhood. Themes that emerged from the East-town interviews included a perceived lack of provision, an unattractive leisure environment, and perceptions of crime and antisocial behaviour. In contrast, West-town respondents had mostly positive perceptions of LTPA in their neighbourhood. Themes that emerged from the West-town interviews included a well-served and appropriate leisure environment, attractive and walkable surroundings, and responsible and trustworthy neighbourhood residents.

There was a difference in the perceived appropriateness of the leisure environment between the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. East-town respondents felt that neighbourhood facilities were designed primarily for young people and that appropriate leisure resources were located too far away to be of any practical benefit. In contrast to this, West-town residents felt that their neighbourhood was well served and that the leisure provision met their needs for LTPA. Access to appropriate leisure facilities has previously been identified by a number of researchers as a significant determinant of older adults' LTPA, and older people who perceive leisure facilities and resources as being accessible and appropriate have been found to have higher rates of LTPA participation (Booth et al., 2000; King, 2001; Li et al., 2005). Interestingly, there were a comparable number of publicly accessible leisure facilities in East-town and West-town (as noted in Chapter Three, pages 45-46), yet East-town respondents considered their neighbourhood leisure environment to be less suitable for LTPA participation than West-town respondents. There are a number of possible reasons for this. Firstly, the quality of the leisure facilities in East-town may be inferior to those in West-town. Secondly, the leisure facilities in East-town may be less attractive and more utilitarian, promoting use, but not enjoyment and satisfaction (as suggested by the Q method findings). Thirdly, there may be a different overall mix of provision in East-town which was considered to be less appropriate than the resources provided in West-town. Finally, it is possible that the superior

number of heritage places that were present in West-town augmented the existing leisure environment and made it more conducive to older adults' LTPA participation.

There were also stark differences in the perceived attractiveness of the neighbourhood environment between the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. East-town respondents felt that their neighbourhood environment was visually unattractive and characterised by physical degradation. In particular, East-town respondents spoke about the litter, graffiti, and the unkempt appearance of homes and gardens in the neighbourhood as deterrents to LTPA in general and walking in particular. Contrasting this, West-town respondents perceived their neighbourhood environment to be highly attractive and conducive to walking for LTPA. In particular, West-town respondents noted that the presence of established trees, attractive parks and gardens, pristine streets and well-maintained homes and gardens were prominent features of their neighbourhood that facilitated walking for LTPA. Epidemiological research has previously identified neighbourhood attractiveness and good neighbourhood design as influences on walking behaviour among adult and older-adult populations (Giles-Corti & Donovan, 2002b; Michael et al., 2006; van Lenthe et al., 2005). These findings also reinforce the results of the Q study, which suggested that the less deprived neighbourhood of West-town may be more attractive and, therefore, more conducive to LTPA, than the more deprived neighbourhood of East-town.

There were also differences between the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town in relation to perceptions of the social environment and its influence on LTPA participation. Many of the East-town respondents spoke about a negative social environment punctuated by high levels of crime and antisocial behaviour, which made older adults less inclined to be active in their neighbourhood. Many of the East-town residents indicated that they had been directly exposed to burglary and vandalism, had experienced a strong and worrying police presence, and frequently heard of violent assaults and drug dealing occurring in their neighbourhood. This perceived exposure to crime appeared to inculcate a fear of the streets among many of the older residents of East-town. In addition to an exposure to crime, many of the East-town respondents felt that other neighbourhood residents were unfriendly and untrustworthy and this made them fearful of leaving home to be active in their neighbourhood. Moreover, the presence of what were perceived to be vicious neighbourhood dogs also made the prospect of neighbourhood activity particularly unsavoury. In contrast to the experiences of East-town residents, West-town

respondents indicated that they had a much lower exposure to crime and reported only incidental and sporadic experiences of vandalism and burglary. West-town respondents also felt that their neighbourhood was inhabited by responsible and trustworthy people who were proud of their neighbourhood, valued their local leisure resources and did not impinge upon the activities of others. The influence of crime and antisocial behaviour on older adults' LTPA has seldom been reported in the epidemiological literature. In studies of the general-adult population, however, levels of required police attention and the trustworthiness of neighbours have previously been identified as determinants of LTPA participation (Addy et al., 2004; van Lenthe et al., 2005). This research suggests that the quality of the social environment may be an important influence on older adults' LTPA.

The divergent themes that emerged from the semi-structured interviewing were all related to aspects of the physical and social environment. These findings support an ecological perspective on older adults' LTPA participation which asserts that characteristics of the neighbourhood environment have the capacity to either facilitate or constrain behaviours, such as participation in LTPA (Sallis et al., 1998; Stokols, 1992).

#### **5.4.2 What do the interview results contribute to an understanding of how neighbourhood deprivation influences older adults' LTPA participation?**

Semi-structured interviewing of older adult respondents from East-town and West-town identified a number of potential pathways through which neighbourhood deprivation may influence older adults' LTPA. Qualitative data derived from the semi-structured interviews suggest that residence in a high-deprivation neighbourhood, such as East-town, may expose older adults to a range of negative physical and social environmental conditions which potentially constrain participation in LTPA. These conditions were characterised by inappropriate leisure provision, an unattractive neighbourhood environment and perceptions of considerable crime and antisocial behaviour. Alternately, the physical and social environmental conditions in a low-deprivation neighbourhood, such as West-town, may facilitate LTPA participation. These conditions were characterised by perceived appropriate leisure provision, an attractive and highly walkable neighbourhood environment and responsible and trustworthy residents.

Semi-structured interviewing also identified a number of variables that potentially influenced older adults' LTPA, but which were unrelated to an individual's neighbourhood of residence. These variables included health status and functional ability, interest and motivation, the availability of an activity partner or group, and the presence of traffic. The results suggest that older adults who suffered from poor health or disability were less likely to participate in LTPA than those who reported no physical limitations; older adults who were more interested in and motivated to be active were more likely to participate in LTPA than those who were lacking interest or motivation; those who had a spouse, friend or group to be active with were more likely to participate in LTPA than those who had a lack of social support; and, the noise, speed and exhaust fumes associated with urban traffic were a hindrance to LTPA participation.

In accordance with the recall survey and Q method findings, the semi-structured interview results also supported an ecological understanding of older adults LTPA participation. The results of the semi-structured interview suggest that there were multiple levels of influence on older adults' LTPA participation, including a significant influence from the contrasting physical and social environmental conditions manifest in the neighbourhoods of high and low deprivation.

## **5.5 An integrated ecological model**

This section presents an ecological model (see Figure 7) which attempts to integrate the findings from each of the three methods of enquiry employed in this research to answer the primary research question: how does neighbourhood deprivation influence older adults' leisure time physical activity participation? The model has been constructed by the researcher and represents an ecological perspective on older adults' LTPA participation. The model presented in this research is different from other ecological models that have been proposed in the physical activity epidemiology and leisure studies paradigms because it shows the influence of neighbourhood deprivation on LTPA and identifies specific pathways to higher or lower levels of participation. Due to the exploratory nature of this research, equal weighting has been given to the findings derived from the recall survey, Q method and semi-structured interview.



Analysis of the results derived from the recall survey and semi-structured interview revealed that there were a number of intrapersonal and interpersonal variables which appeared to act as universal facilitators and constraints to older adults' LTPA participation in both the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. Universal facilitators to LTPA that were identified by the recall survey and semi-structured interview included being male, having good health and functional ability, having high levels of interest and motivation, and having an activity partner or group available. Alternatively, the universal constraints to LTPA that were experienced by older adults who lived in both neighbourhoods included being female, suffering from poor health or disability, having low levels of interest and motivation, and lacking an activity partner or group. The universal facilitators and constraints to older adults' LTPA appeared to be unrelated to an individual's neighbourhood of residence. This suggests that the intrapersonal and interpersonal influences on LTPA may act uniformly across the older-adult cohort irrespective of residential location.

Although there appeared to be a number of universal intrapersonal and interpersonal influences on older adults' LTPA participation in both neighbourhoods, there were also significant disparities between the high-deprivation neighbourhood of East-town and the low-deprivation neighbourhood of West-town. These disparities were associated with the physical and social environment in each neighbourhood and were identified by the findings derived from Q method and the semi-structured interviews.

For older adults from the high-deprivation neighbourhood of East-town, the physical and social environment presented few facilitators and many constraints to LTPA. The only factor that appeared to facilitate LTPA participation in the high-deprivation neighbourhood of East-town was the presence of nature, which was characterised by neighbourhood parks and gardens. Constraining factors that were associated with residing in the high-deprivation neighbourhood of East-town included a lack of appropriate leisure provision, an unattractive neighbourhood environment, the presence of traffic, and a perceived prevalence of crime and antisocial behaviour. Inappropriate leisure provision was characterised by the apparent prevalence of youth-oriented leisure resources, appropriate facilities perceived as being too far from home, and a potentially detrimental imbalance between utilitarian and aesthetically pleasing leisure resources. An unattractive neighbourhood environment was characterised by the high perceptions of litter, graffiti and residential degradation. The presence of traffic in East-town was also considered to be a constraint to LTPA participation as a consequence of

perceptions of excessive speed, noise and exhaust fumes. The prevalence of crime was typified by a high perceived exposure to criminal activity, such as burglary and vandalism; hearing about violent assaults and drug dealing occurring in the neighbourhood; and experiencing a high police presence, which was perceived as indicative of neighbourhood social problems. Antisocial behaviour was experienced in terms of unfriendly and untrustworthy neighbours and the presence of aggressive neighbourhood dogs. The high number of perceived neighbourhood constraints that were experienced by East-town respondents appeared to be associated with a reduced prevalence of LTPA participation, particularly neighbourhood LTPA, which was identified in the analysis of the recall survey results.

In stark contrast to the situation in East-town, the physical and social environment of the low-deprivation neighbourhood of West-town presented many facilitators and relatively few constraints to LTPA. The only notable constraint to LTPA participation in West-town was the presence of traffic – in terms of excessive speed, noise and exhaust fumes – which was also reported as a constraint to LTPA by older adult respondents from East-town. Facilitators to LTPA participation that were reported in the low-deprivation neighbourhood of West-town included appropriate leisure provision, neighbourhood attractiveness, walkability, a low perception of crime, and responsible and trustworthy neighbours. Appropriate leisure provision was typified by high quality, appealing and proximate leisure facilities and resources. Neighbourhood attractiveness was associated with the presence of nature; the abundance of heritage features; and pristine streets, homes and facilities. Walkability was characterised by the safe and attractive footpaths and abundance of off-street walkways which were features of the West-town neighbourhood. A low perception of crime was related to predominantly vicarious experiences of incidental vandalism and sporadic burglary and a perception that West-town had lower rates of crime than other parts of Christchurch. Responsible and trustworthy residents were characterised by pride in and care of neighbourhood leisure resources, maintaining homes and gardens to a high standard, and being considerate towards other neighbourhood residents. The greater number of facilitators to LTPA that were reported by West-town respondents appeared to be associated with an increased prevalence of LTPA participation, particularly neighbourhood LTPA, which was identified in the analysis of the recall survey results.

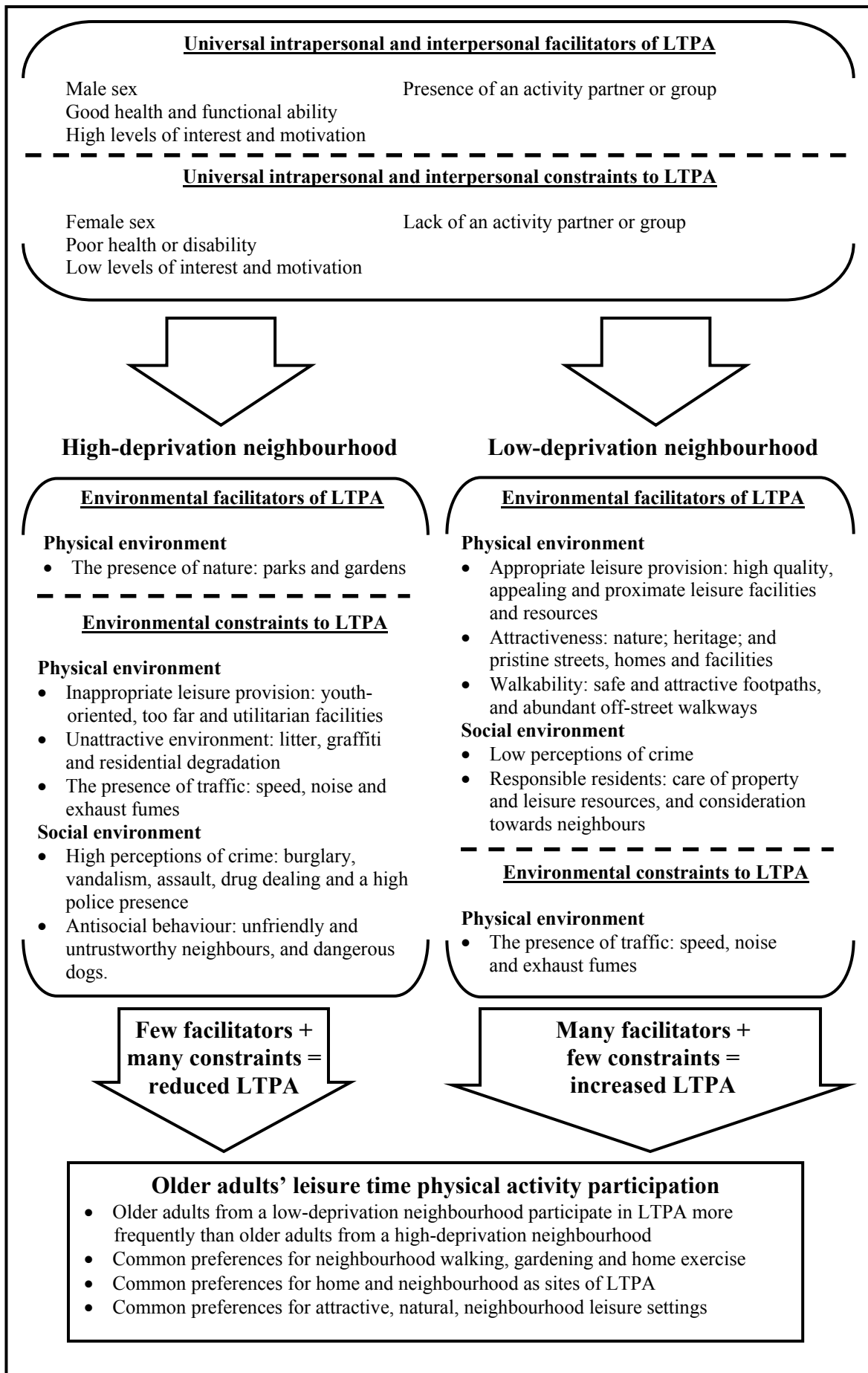
Analysis of the recall survey results demonstrated that neighbourhood deprivation was significantly associated with overall LTPA participation and that older adults from low-

deprivation neighbourhood of West-town participated in LTPA, on average, more frequently than older adults from the high-deprivation neighbourhood of East-town. In particular, older adults from West-town were more active within their neighbourhood and outside of their neighbourhood than older adults from East-town. This result appeared to be related to the physical and social environmental conditions of each neighbourhood.

Analysis of the recall survey and Q method findings also revealed that, regardless of how active they were or where they lived, older adults from the neighbourhoods of high and low deprivation had common preferences for neighbourhood walking, gardening and home exercise; common preferences for home and neighbourhood as sites for LTPA; and common preferences for attractive, natural, leisure settings.

In answer to the primary research question, and as shown in the model (Figure 7), living in a neighbourhood of high deprivation, such as East-town, appears to be associated with a reduced LTPA participation. This reduced participation seems to be mediated by differences in the physical and social environment that were manifest in the neighbourhoods of high and low deprivation. The high-deprivation neighbourhood of East-town presented older adult residents with many physical and social environmental constraints and comparatively few facilitators to LTPA. In contrast, the low-deprivation neighbourhood of West-town presented older adult residents with many physical and social environmental facilitators and comparatively few constraints to LTPA. Neighbourhoods that present many constraints to LTPA, but few facilitators, may trigger a pattern of disuse and an aversion to neighbourhood LTPA which may lead to decrements in health and functional ability among the older adult population.

Figure 7: An integrated ecological model



# **Chapter Six: Limitations, implications, recommendations & conclusion**

## **6.1 Chapter introduction**

The purpose of the final chapter is to evaluate the current study, suggest future research directions and reiterate the main points of the thesis. In the first section, the limitations of the current research are discussed. In the second section, the implications of the present findings for policy and research are considered. In the third section, a number of recommendations for future investigations are made on the basis of the present research findings. The final section provides a summary of the material presented throughout the current thesis.

## **6.2 Limitations of the research**

This research had a number of limitations which may have influenced the findings and which should be taken into account when reading or evaluating this study. The limitations of this research relate to the sampling of the neighbourhoods under investigation and the residential population, the research design and the methods of enquiry. Each limitation is now discussed.

### **6.2.1 Limitations of the neighbourhood samples**

The limitations associated with the neighbourhood samples relate to the use of a researcher-defined and distance-based definition of neighbourhood and the use of a deprivation index as a proxy measure of the quality of the physical and social environment. The researcher-defined and distance-based definition of neighbourhood that was employed in this research was somewhat arbitrary and unlikely to coincide exactly with individuals' subjective perceptions of neighbourhood (Ball et al., 2006). Although distance-based definitions are more inclusive than administrative ones, such as area units, it is possible that a number of important neighbourhood attributes, which may have influenced leisure time physical activity (LTPA) participation, were not included in the researcher's characterisation of the East-town and West-town neighbourhoods. This research was also characterised by the use of a deprivation index as a proxy measurement for the quality of the neighbourhood

environment. Because deprivation indices are constructed from aggregate measures of the socioeconomic characteristics of individual residents, however, they cannot directly determine whether differences that are observed across neighbourhoods are due to environmental factors or to the types of individuals living within those areas (Salmond & Crampton, 2002; Statistics New Zealand, 2006). Consequently, deprivation indices cannot evaluate the role of individual-level factors as potential confounders, mediators or modifiers of LTPA behaviour (Salmond & Crampton, 2002).

### **6.2.2 Limitations of the residential samples**

The limitations associated with the residential samples relate to generalisability and representativeness. The total sample size employed in this research was relatively small ( $N = 63$ ). Small sample sizes, however, reduce the extent to which the findings of research can be extrapolated to a larger population (Babbie, 2004). Although the sample size was minimally adequate for statistical analysis, prudence should be exercised when attempting to make generalisations from the research findings beyond the neighbourhoods involved in this research (Singleton & Straits, 1999). Additionally, the representativeness of the sample groups could not be easily ascertained because demographic data would have been difficult and time consuming to obtain for the neighbourhoods under investigation. In more in-depth studies which employ researcher-defined neighbourhoods, it would be appropriate to use data at the mesh block level to accurately determine the relevant demographic characteristics of the target population. Another limitation related to representativeness is related to the older adults who declined to participate in this research. Individuals who chose not to participate in this research indicated that they either had no interest in the research or they had a lack of knowledge about the research topic. It is possible that the nonrespondents represented a particularly inactive subgroup of the older adult population in each neighbourhood. As a result, the sample of older adults that participated in this study may have been biased towards higher levels of physical activity, and the results may not truly reflect the older-adult cohort that exists in East-town and West-town.

### **6.2.3 Limitations of the research design**

The limitations associated with the research design relate to the use of a cross-sectional approach and the validity of integrating findings arising from dissimilar methods of enquiry.

Like much of the epidemiological research that has investigated neighbourhood influences on older adults' LTPA participation, this study employed a cross-sectional research design. As the results are based on the one-off examination of the two small groups of older adults, however, it is not possible to establish a causal relationship between neighbourhood conditions and LTPA participation (Babbie, 2004; Satariano & McAuley, 2003). The use of a cross-sectional research design also makes reverse causation a theoretical possibility, whereby people who undertook less LTPA may have self-selected into a more deprived neighbourhood because they had no requirement for neighbourhood features that promoted physical activity (Breeze et al., 2005). In addition to the cross-sectional design, this research also involved combining results from three diverse research methods (recall survey, Q method and semi-structured interview), with divergent epistemological backgrounds, to answer a primary research question. Each research instrument was employed to answer a specific research subquestion, which contributed to the primary research question, and provided differing levels of analysis: qualitative, quantitative or a mixture of both (as in Q method). The three methods of enquiry, however, may not have been compatible, and the integration of the findings arising from these distinct methods into a singular model may have reduced the validity of the research.

#### **6.2.4 Limitations of the methods**

The limitations associated with the methods of enquiry relate to the measurement of LTPA and the particular application of Q method employed in this research. This research did not measure intensity or duration of LTPA participation. As a result, the findings presented in the research are not indicative of absolute levels of LTPA. While East-town respondents were found to have a lower prevalence of LTPA participation than respondents from West-town, it is possible, though unlikely, that East-town respondents participated with greater intensity or for longer periods than their counterparts in West-town. As previously mentioned in Chapter Three, this study also relied on self-reported LTPA participation. Self-reports of physical activity behaviour, however, are prone to response bias, particularly over-reporting, which has previously been observed among samples of older adults (Dergance et al., 2003; Sallis & Saelens, 2000). There were also limitations associated with the use of Q method in this research. There was a high degree of abduction and inference, on the part of the researcher, associated with the identification and interpretation of significant factors which may have introduced bias into the results. Additionally, this research employed a relatively unorthodox use of Q method. The Q sorts that were undertaken in East-town and West-town were

comprised of two different sets of images which were intended to represent the unique leisure environment in each neighbourhood. As a result, the comparison between the factors that emerged between East-town and West-town was far more subjective than systematic, which may have introduced further researcher bias into the results.

### **6.3 Implications of the research**

The findings of this research, if confirmed in subsequent investigations, have a number of important implications for leisure providers and for epidemiological and leisure researchers. These implications relate to possible environmental interventions to increase older adults' LTPA participation in highly deprived neighbourhoods, conceptualisations of older adults LTPA preferences and behaviours, and the relevance of ecological models for understanding older adults' LTPA participation.

This research identified that residence in a neighbourhood of high deprivation may be associated with comparatively lower levels of LTPA participation among older adults, and that this reduced LTPA participation may be mediated by deleterious physical and social environmental conditions in more deprived neighbourhood settings. These findings suggest that interventions that are aimed at increasing older adults' LTPA and decreasing neighbourhood inequalities in LTPA should consider altering neighbourhood characteristics as a possible mechanism for increasing participation. Enhancing neighbourhood attractiveness, increasing the presence of natural features, developing the heritage characteristics of neighbourhoods, increasing the proximity to age-appropriate leisure resources, providing a high-quality and safe walking environment, reducing the levels of crime and promoting greater social cohesion may all be valid mechanisms for encouraging greater LTPA participation among older adults who live in neighbourhoods of high deprivation. Such an approach would necessitate increased coordination between urban planners, local government, community groups and the police in order to achieve substantial and positive environmental change (Balfour & Kaplan, 2002). If the physical and social conditions of the most deprived neighbourhoods could be sufficiently improved, older adult residents may become more physically active as a result. While it is recognised that leisure providers have to make cost-benefit analyses with regard to supporting different communities and demographics and that some neighbourhood features cannot be easily remedied, such as the location of industry or the prevalence of crime, some positive changes can be made in



more deprived areas, such as the provision of more bench seating, which need not be prohibitively expensive and which could have a positive impact on older adults' LTPA participation.

This research also revealed that older adults have a number of similarities in terms of preferred activities and settings, regardless of their neighbourhood conditions. These similarities were typified by preferences for walking; preferences for home- and neighbourhood-based activities; and preferences for attractive, natural, leisure settings. These shared preferences imply that there is a degree of homogeneity in older adults' leisure preferences, which has ramifications for leisure provision for the elderly. Given the popularity of neighbourhood walking as a form of LTPA for older adults, improving the quality, safety and comfort of the walking environment through the provision of high-quality footpaths, safe crossing facilities, adequate street lighting and the increased provision of bench seating, may be vital for increasing older adults' LTPA participation in both deprived and non deprived neighbourhoods. Furthermore, the common preference of older adults to be most active in their home and neighbourhood implies that leisure provision for older adults should be governed by an ethos of localism, wherein the bulk of the funding and provision for leisure resources are directed at the level of the community and the neighbourhood. Considering the geographical constriction that occurs in older adults' sphere of leisure activities, interventions that capitalise on and develop neighbourhood resources have a better chance of being sustained and are likely to be more successful at increasing older adults' participation in LTPA (Kelly, 1996; Prohaska et al., 2006). The preference for attractive, natural settings among the older-adult cohort suggests that increasing the density of neighbourhood parks, gardens and the abundance of trees and street plantings may also be appropriate for encouraging older adults to be more active in their neighbourhood. The fact that older adults appear to have a number of similar tastes in terms of preferred LTPA activities and settings also implies that a set of standards or best practice guidelines for the leisure provision for older adults could be developed. In New Zealand, the development of such guidelines could be coordinated by institutions such as Sport and Recreation New Zealand, the New Zealand Recreation Association or by an appropriate tertiary institution.

This research also demonstrated that there were multiple levels of influence on older adults' LTPA participation in neighbourhoods of high and low deprivation: intrapersonal, interpersonal and environmental. This finding is in line with ecological models of physical activity behaviour (Raymore, 2002; Sport and Recreation New Zealand, 2005; Stokols, 1992)

and suggests that ecological theory may be the most appropriate framework for understanding older adults' LTPA participation. Support for an ecological model implies that strategies which are designed to increase older adults' LTPA need to address environmental as well as intrapersonal and interpersonal influences in order to successfully promote behaviour change, especially among older adults who live in high-deprivation neighbourhoods. King, Rejeski & Buchner (1998) have argued that combining environmental interventions with educational and behavioural programs, for example, may bolster intervention success with regard to the older adult population. Interventions that focus only on the intrapersonal and interpersonal influences on older adults' LTPA are unlikely to achieve lasting behaviour change because they fail to recognise that the physical and social attributes of highly deprived neighbourhoods may act as powerful constraints to LTPA participation. Support for an ecological perspective also suggests that researchers should acknowledge multiple levels of influence on older adults' LTPA behaviour in their hypotheses, research questions and research design, lest the blind pursuit of individual-level influences on LTPA participation continue.

#### **6.4 Recommendations for future research**

The outcomes of this research and the existing gaps in the epidemiological literature suggest that more research is needed to corroborate the present findings and to further explain how neighbourhood deprivation influences older adults' LTPA participation.

Recommendations for future research relate to the need for more objective measures of LTPA and neighbourhood deprivation, the need for longitudinal studies and the importance of qualitative research methods. At the end of this section, a number of questions are posed which could be considered by future researchers to extend the findings of this research and to increase the limited knowledge base concerning the influence of neighbourhood deprivation on older adults' LTPA participation.

Future research studies might benefit from the use of more objective measures of older adults' LTPA behaviour, which may help to reduce bias associated with the use of self-report measures. The use of heart-rate monitors, pedometers or time-use diaries could more accurately determine the prevalence of LTPA among older-adult samples. Similarly, there is a need for more objective measures of the physical and social environments of neighbourhoods. More objective measures of the neighbourhood environment could be obtained through the use of geographic mapping software and the use of specific, neighbourhood-level statistics

related to leisure provision, infrastructure and amenities, or the prevalence of crime. Purpose-built scale measures for the assessment of the quality of the physical and social environment could also be constructed, which would allow researchers to systematically evaluate neighbourhood conditions prior to research.

Longitudinal research also needs to be conducted to investigate the persistence over time of the influence of neighbourhood deprivation on older adults LTPA participation. Longitudinal research designs provide stronger inferences about causal direction and would help to determine whether or not neighbourhood deprivation could be considered as a cause of older adults' LTPA behaviour (Singleton & Straits, 1999). An appropriate research design might include a nationwide postal survey of the LTPA prevalence among older adults living in high- and low-deprivation neighbourhoods. Follow-up surveys, asking the same questions, could be sent to respondents for a number of years to ascertain whether or not there is a persistent trend in neighbourhood differences in LTPA participation. Once the existence of a causal pattern has been established, in-depth approaches, such as semi-structured interviewing, could proceed unfettered to confirm the underlying influences on neighbourhood disparities in older adults' LTPA participation.

Future research could also give more weight to qualitative research methods when investigating neighbourhood influences on LTPA. The neighbourhood environment is a veritable black box of potential influences and only qualitative methods have the flexibility and sensitivity to be able to identify and explain the complex array of factors that may influence LTPA participation. In this research, semi-structured interviewing proved to be a particularly fruitful method for identifying and explaining neighbourhood influences on older adults' LTPA participation. Moreover, qualitative methods can also provide useful triangulation and support for more traditional methods of data collection, such as surveys, which continue to dominate epidemiological research (Singleton & Straits, 1999).

The findings of this research have also raised a number of questions which could be investigated in future studies to extend the findings of this research and add to the limited body of evidence regarding the influence of neighbourhood deprivation on older adults' LTPA participation. Possible research questions include the following:

- What relative contribution do intrapersonal, interpersonal and environmental factors make to older adults' LTPA participation in high- and low-deprivation neighbourhoods?

- To what extent are neighbourhood differences in older adults' LTPA related to population composition or to aspects of the physical and social environment?
- How does neighbourhood deprivation influence older adults' participation in neighbourhood walking?
- How effective are environmental interventions at increasing the LTPA participation of older adults in high-deprivation neighbourhoods?

## 6.5 Conclusion

And in the end, it's not the years in your life that count. It's the life in your years.  
(Abraham Lincoln, 1809-1865)

Expected growth in the absolute and relative size of the older-adult cohort and the current high rates of inactivity which persist within this population have raised concerns about an increasing prevalence of lifestyle-related disease and disability and a potential crisis in the provision of public healthcare for the elderly (Prohaska et al., 2006; Stephenson & Scobie, 2002). The well-established links between LTPA and health offer a potential pathway to compress illness and disability in later life and reduce a so-called burden of ageing on society (Fries, 1996; Nelson et al., 2007). The utility of LTPA for offsetting the potentially negative health outcomes associated with population ageing has prompted researchers to investigate the influences on older adults' LTPA as a precursor to the development of interventions aimed at increasing participation in this health-promoting behaviour (U.S. Department of Health and Human Services, 1998). To date, however, most of the research which has investigated the influences on older adults' LTPA has focussed on individual-level determinants of behaviour. Environmental factors are among the least studied of the influences on LTPA, but they are potentially highly relevant for older adults (Kelly, 1996; King, 2001). Moreover, there have been few studies, and none involving the elderly, which have investigated the influence of neighbourhood deprivation, a proxy measure of the physical and social environment, on LTPA participation.

This study addressed a gap in the existing epidemiological literature by exploring how neighbourhood deprivation influenced older adults' LTPA participation. The research compared the LTPA behaviours, preferences and perceptions of two groups of older adults recruited from high- and low-deprivation neighbourhoods in Christchurch, New Zealand.

Neighbourhoods were selected for inclusion in this research because of their contrasting levels of socioeconomic deprivation and were subjectively defined by the researcher. The study utilised a mixed-methods approach, incorporating a recall survey, Q method with photographs, and semi-structured interviewing, to garner a variety of qualitative and quantitative data from the research participants for the purposes of developing an in-depth understanding of the research problem.

In keeping with ecological theories of behaviour change (McLeroy et al., 1988; Stokols, 1992), this research found that there were multiple influences on older adults' LTPA participation: intrapersonal, interpersonal and environmental. The intrapersonal and interpersonal influences on LTPA included sex, health status, interest and motivation, and the availability of an activity partner or group. These influences appeared to be universal; affecting older adults' LTPA participation irrespective of residential location. The physical and social environmental conditions in neighbourhoods of high and low deprivation were also found to influence older adults' LTPA participation. Residing in a high-deprivation neighbourhood, such as East-town, appeared to be associated with reduced participation in LTPA, particularly neighbourhood LTPA. In East-town, there appeared to be many environmental constraints to LTPA and comparatively few facilitators. Constraints included inappropriate leisure provision, an unattractive neighbourhood environment, traffic, high perceived crime and perceptions of antisocial behaviour. By contrast, residing in a low-deprivation neighbourhood, such as West-town, appeared to be associated with increased participation in LTPA, particularly neighbourhood LTPA. In West-town, there appeared to be many environmental facilitators to LTPA and comparatively few constraints. Facilitators included appropriate leisure provision, neighbourhood attractiveness, walkability, low perceived crime and perceptions of responsible neighbourhood residents.

Potential increases in the number of older New Zealanders suffering preventable morbidity resulting from sedentary lifestyle behaviour makes it sensible to consider upstream ecological approaches to disease prevention and health promotion (Campbell, 1993; Prohaska et al., 2006). Achieving a compression of morbidity among the older adult population through the widespread uptake of more active lifestyles offers a public health strategy for the prevention of chronic health problems and disability in later life which could potentially reduce public health costs and improve individual health outcomes for the growing population of older adults (Fries, 1996; Ministry of Health, 2004c). It seems, however, that older adults who live in high-deprivation neighbourhoods are likely to encounter significant physical and

social environmental constraints to LTPA participation which may predispose them to poor health and disability associated with inactivity. The findings of this research suggest that intervening in the physical and social environment may be an appropriate strategy to increase the LTPA participation of older adults who live in high-deprivation neighbourhoods.

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## Appendices

### Appendix I: Information letter

June 2007



Dear Sir/Madam,

You are invited to participate in a project entitled: Neighbourhood environment and older adult leisure time physical activity. The aim of this research is to explore the impact of neighbourhood conditions on the leisure time physical activity participation of older adults. You have been approached by the researcher because you are aged 65 and older and because of your area of residence in Christchurch.

Your participation in this project will involve:

- Answering a small number of survey questions about your participation in leisure time physical activity,
- Ranking a number of photographs relating to your local leisure environment and
- Talking about your leisure time physical activity participation and your neighbourhood.

Your involvement in this research will take up to 45 minutes. Interview results will be tape recorded and results of the project may be published, but you are assured of the complete confidentiality of data gathered in this investigation. A transcript of your interview will be returned to you should you wish to make any changes. You may also withdraw your participation, and any information provided, at any time during the interview and up to ten days following your participation in this research. Analysis of the results will begin in the first week of August, 2007.

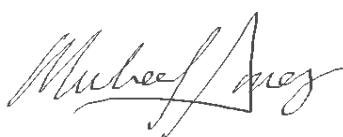
To ensure anonymity and confidentiality the following steps will be taken:

- All statistical results will be combined, so that individual responses cannot be identified,
- Made-up names will be used in all presentations of the research findings, and
- Consent forms and interview data will be stored separately in a secure location in accordance with Lincoln University policies and procedures.

The project is being carried out by me, Michael Annear, a postgraduate student in the Social Science, Parks, Recreation and Tourism Group at Lincoln University. Should you have any questions or concerns about your participation in the project you can contact me by email at [annearm2@lincoln.ac.nz](mailto:annearm2@lincoln.ac.nz) or by phone at 021 075 4207. Alternatively, you can contact my supervisor, Grant Cushman, by email ([cushmanj@lincoln.ac.nz](mailto:cushmanj@lincoln.ac.nz)) or by phone (03 325 3806).

This project has been reviewed and approved by the Lincoln University Human Ethics Committee.

Yours sincerely,

A handwritten signature in black ink that reads "Michael Annear". The signature is written in a cursive style with a large, stylized 'M' and 'A'.

Michael Annear

Post Graduate researcher

Social Science, Parks, Recreation and Tourism Group

**LINCOLN UNIVERSITY**

## Appendix II: Consent form

**Name of Project:** Neighbourhood environment and older adult leisure time physical activity.

I have read and understood the description of the above-named project. On this basis, I agree to participate in the project and I consent to publication of the results of the project with the understanding that anonymity and confidentiality will be preserved. I understand that a tape recorder will be used. I understand also that I may withdraw my participation and any information that I have provided from the project up until the time that the results of this research are analysed.

Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

## **Appendix III: Research instrument**

### **PERSONAL INFORMATION**

Age in years: \_\_\_\_\_

Sex:        Male        Female

Length of time at current address: \_\_\_\_ Years \_\_\_\_ months

Do you have a medical condition or disability that limits your ability to be physically active?

Yes        No

## PART 1

**We are now going to begin the first part of the interview. The questions that I will ask you are about the leisure time physical activities that you participated in during the last two weeks.**

---

**Leisure time physical activities** are physical activities performed during exercise, recreation, sport, or at any time other than that associated with your regular home duties, work or transportation. Examples include: Aerobics, cycling for enjoyment or exercise, dancing, DIY for enjoyment, exercising at home, exercise classes, fishing, gardening for enjoyment, golf, indoor bowls or lawn bowls, Kapa haka, running or jogging, swimming or swimming pool exercises, tennis, walking for pleasure or exercise, weight training, and yachting or sailing.

**Neighbourhood** means the area within the largest circle on the map.

### ***QUESTION 1 – LTPA participation***

During the **last two weeks**, did you participate in any leisure time physical activities?

Yes

No

### ***QUESTION 2 – Neighbourhood***

A) During the **last two weeks**, how many times did you participate in leisure time physical activities **within your neighbourhood**, but **outside your home**?

\_\_\_\_\_ Times

B) If you participated in leisure time physical activities in **your neighbourhood**, but **outside your home**, can you tell what activities you did and how often you participated in those activities?

Aerobics	_____	Exercise class	_____
Bowls	_____	Cycling	_____
Dancing	_____	Kapa haka	_____
Running	_____	Swimming	_____

Tennis \_\_\_\_\_ Walking \_\_\_\_\_  
 Weight training \_\_\_\_\_ Other (        ) \_\_\_\_\_

**QUESTION 3 – At home**

A) During the **last two weeks**, how many times did you participate in leisure time physical activities at **your home**?

\_\_\_\_\_ Times

B) If you participated in leisure time physical activities at **your home**, during the **past two weeks**, can you tell me what activities you did and how often you participated in those activities?

Exercising at home \_\_\_\_\_ Gardening \_\_\_\_\_  
 DIY \_\_\_\_\_ Other (        ) \_\_\_\_\_

**QUESTION 4 – Out of your neighbourhood**

A) During the **last two weeks**, how many times did you participate in leisure time physical activities **outside your neighbourhood**?

\_\_\_\_\_ Times

B) If you participated in leisure time physical activity **outside your neighbourhood**, during the **last two weeks**, can you tell me what activities you did and how often you participated in those activities?

Aerobics \_\_\_\_\_ Exercise class \_\_\_\_\_  
 Bowls \_\_\_\_\_ Cycling \_\_\_\_\_  
 Dancing \_\_\_\_\_ Fishing \_\_\_\_\_  
 Golf \_\_\_\_\_ Kapa haka \_\_\_\_\_  
 Running \_\_\_\_\_ Swimming \_\_\_\_\_  
 Tennis \_\_\_\_\_ Tramping \_\_\_\_\_  
 Walking \_\_\_\_\_ Yachting/Sailing \_\_\_\_\_  
 Weight training \_\_\_\_\_ Other (        ) \_\_\_\_\_

## PART 2

**We are now going to begin the second part of the interview. I will ask you to arrange a number of photographs of the leisure environment in your neighbourhood and then to talk about your selection. I will also ask you about your neighbourhood and your experience of leisure time physical activity within your neighbourhood.**

---

Please arrange these photographs from least preferred to most preferred according to the places that you like for leisure time physical activities.

Please explain why you ordered the photographs in this way, paying particular attention to the photographs that you least preferred and most preferred.



### PART 3

**We are now going to begin the final part of the interview. I will ask you a number of questions about your perceptions of your neighbourhood and leisure time physical activity within your neighbourhood.**

---

What is your neighbourhood like for leisure time physical activities?

How suitable is your neighbourhood for older adults' leisure time physical activities?

Is there anything about your neighbourhood that influences your participation in leisure time physical activities?

- For example: crime level, neighbours, traffic, quality and closeness of facilities

Would your participation in leisure time physical activities be different if you lived in a different neighbourhood?

Can you think of anything else, aside from neighbourhood features, that has an influence on your LTPA?

- For example: Weather, health, family commitments, finances, access to transportation

## Appendix IV: East-town Q sample



(1)



(2)



(3)



(4)



(5)



(6)



(7)



(8)



(9)



(10)



(11)



(12)



(13)



(14)



(15)



(16)



(17)



(18)



(19)



(20)



(21)



## Appendix V: West-town Q sample



(1)



(2)



(3)



(4)



(5)



(6)



(7)



(8)



(9)



(10)



(11)



(12)



(13)



(14)



(15)



(16)



(17)



(18)



(19)



(20)



(21)