## Title

“Can I Come To The Park?” Access to Urban Open Space: An investigation of older adults in Australia, their perceived and real access to open space, and implications for practice.



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# “Can I Come To The Park?”
# Access to Urban Open Space:
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A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Urban Planning

by

Stephen Craig Gibson

2017

ABSTRACT OF THE DISSERTATION

# “Can I Come To The Park?”
# Access to Urban Open Space:
# An investigation of older adults in Australia, their perceived and real access to open space, and implications for practice.

by

Stephen Craig Gibson
Doctor of Philosophy in Urban Planning
University of California, Los Angeles, 2017
Professor Anastasia Loukaitou-Sideris, Chair

Do older adults access open space to fulfill different needs than younger adults? Prior studies determine that age, gender, and culture influence open space visitation, but we know little about why. Yet, older adults are particularly disadvantaged if their specific needs, preferences, or constraints in accessing open space are not considered. Practitioners who plan, design, and manage these spaces need guidance regarding the older adult experience in open space to encourage visitation.

Referencing self-determination theory, this study focuses on autonomy, competence, and relatedness needs fulfilment in older adults, interactions between older adults and open space, and motivations that nurture older adult open space revisitation. Perceptions of accessibility among younger versus older adults, and between men and women are compared. The research aims to 1) develop a deeper comprehension of older adult motivational aspects of open space use; 2) develop means through which practice can focus on providing appropriately planned, designed, and managed open space; and 3) consider ways wherein community engagement processes may realize the potential for provision of older-adult-friendly open space.

The study utilizes a mixed-methods empirical approach combining qualitative and quantitative data and analysis to illuminate the complexity of psychological needs in the motivation to visit open space and the elements required to satisfy these needs. 23 interviews and 1043 survey responses from Australia were comprehensively analyzed to test hypothesized relationships within a theoretical model of motivation for open space visitation.

Findings indicated that older adults 65 and over differ in the level and type of motivation to visit open space than younger adults. More so than younger adults, older adults were motivated to revisit an open space that fulfills their autonomy needs. Elements of the natural environment were the strongest significant predictors of autonomy need fulfilment in older adults, both men and women, followed by elements of convenience (for men) and community (for women). Finally, results indicated that when older adult autonomy needs are fulfilled, revisitation to open space is likely. Implications for location and amenity were derived from these findings. Recommendations for design, planning and management of open space to increase visitation are provided.

The dissertation of Stephen Craig Gibson is approved.

Vinit Mukhija

Lois Takahashi

Tridib Banerjee

Anastasia Loukaitou-Sideris, Committee Chair

University of California, Los Angeles

2017

**To the memory of my beloved mother…**

**…the true inspiration behind everything**
**I've accomplished within these pages.**
**You are profoundly missed.**

# Contents

## List of Figures

## List of Tables

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A project of this magnitude can never be accomplished by one lonely soul. Along the journey from passing thought to completed manuscript, many contributions of indelible inspiration and guidance have been offered by those around me, and gratefully accepted. It is through these many offerings that this process of discovery has been one made both bearable and achievable.

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unsuspecting recipients of research findings and teaching inspiration resulting from this dissertation, you have expressed your interest in my work and been supportive in many ways, both large and small; this generosity and support, I could not have expected. A substantial thanks goes to Nefertitti Malcolm who greatly assisted in coordinating the survey data collection efforts and provided her calm wisdom and guidance throughout. Of course, this work could not have been accomplished successfully without the voluntary efforts of my interviewees, who gave of their time freely and happily to learn about my work and contribute their own slice of wisdom to the academic feast; you all gave me a small part of yourselves during our conversations and these moments will not be forgotten.

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Thank you all.

Stephen C. Gibson
January, 18, 2017
Perth, Australia

**Biographical Sketch**

As a certified landscape architect and urban planner for over 20 years, practicing in both Australia and the U.S., Stephen has engaged critical person-centered design issues across both countries. His focus in practice during this period has been community development, residential housing, commercial development, ecological restoration, and parks and open space planning and design. It is particularly his exposure to the cultural aspects of open space use while working in both California and Western Australia that prompted Stephen to venture into the academic world to pursue research on the connection between culture and public open space planning, design, management, and use. Stephen's past experiences in practice have firmly impressed upon him that an understanding of the way in which people use space must first be comprehended prior to being able to plan and design for them appropriately. Previous research conducted by Stephen has confirmed this belief, through findings that indicate a strong disconnect between the complexities of planning and landscape architecture practitioner outcomes, the desires of the client, and the preferences of the end-user. It is through this extensive field research on the subject that Stephen has started to unlock the keys to successful public space provision and design that is inclusive and accessible to all.

Stephen further believes that the place to start this learning for many practitioners is in the classroom and sees his role as Professor and mentor to be critical to the successful application of his initiatives in both academic and practitioner circles. Stephen's current research has investigated older adult use of open space in Perth, Australia, as an entrée to developing tangible policies of equitable access and inclusion in planning and design processes. Future research will expand this focus to investigate accessibility to open space for other social and

cultural groups around the world to forge a more complete understanding of open space planning, design, management, and use.

Stephen is currently serving as an Assistant Professor at the School of Design at the University of Western Australia. It is through this opportunity that Stephen is able to continue this important research and disseminate his findings to his students – the future planners and landscape architects for a new generation.

# CHAPTER 1: INTRODUCTION

What motivates people to access open space? Does this differ across social groups? "If you build it, they will come" seems unlikely, though many park planners still believe it to be true (McKenna, 2002, p. 896). Under which circumstances do older adults access open spaces in ways that differ from younger adults, and what motivates that desire? Studies investigating this phenomenon have determined that age, gender, and racial background may determine the willingness of an individual to visit open spaces. The literature suggests that preferences, constraints, fears, and even biases vary across social groups, whether considering large national, state, or county parks, or small neighborhood open spaces. In addition, researchers have noted that subtle constraints that are not as extensively described in the literature, such as racial discrimination, inequitable park programming or even an individual's perception of a park as unwelcoming, can have influence over open space access (Byrne, 2012). Personal perception of open space and one's experience of it seem to play an important role (Byrne and Wolch, 2009; Gearin and Kahle, 2006; Lo and Jim, 2010; Stodolska et al., 2011). From the supply side, policy-makers and urban planners should be asking which groups have the greatest need for public open space amenities, such as the least affluent, those from minority backgrounds, and older adults (Barbosa et al., 2007). It is, therefore, important to properly evaluate the needs of social groups that comprise the catchment area for a specific park, in order to fully comprehend the issues, instead of taking large-scale national findings at face-value.

This study extends a rich literature on open space access by investigating perceptions of open space access and formulating ways to increase it through policy changes, design modifications, and program offerings for a particularly under-researched social group – older adults (defined as those over the age of 65). Primarily, extant research has considered the

components and amenities of parks that cater to older adults, such as the need for shade and comfortable seating, or the ability to provide opportunities for social connections (Cranz & Young, 2006; Moran et al., 2014). The ways in which older adults perceive these amenities, their relative importance, and how they motivate access and visitation is largely understudied. Older adults are particularly disadvantaged if their specific needs and preferences, or the constraints they face in accessing open space, are not considered in the provision, design, and management of spaces. But is there a way to assist those with limited motivation or ability to access open space?

The primary aim of this research is 1) to develop a deeper comprehension of the motivational aspects of open space use by older adults; 2) to develop impactful means through which practice can be focused on providing appropriately planned, designed, and managed open space, and 3) to consider ways in which community engagement processes may realize the potential for the provision of older-adult-friendly open space.

## Research Questions

This research extends current literature by generating a deeper comprehension of the perceived and real barriers that older adults face in accessing open space. In addition, the research seeks to provide implications for practice that will impact policy, provision, design, and management of open spaces toward increasing access, both perceived and real, and thereby increasing visitation rates to open space. In turn, this approach is intended to positively impact both psychological and physical wellbeing for members of this demographic group. A report produced by UCLA Luskin School of Public Affairs outlining guidelines for senior-friendly parks (Loukaitou-Sideris et al., 2014) notes the importance of addressing the psychological needs of older adults. Assessing motivation to engage in leisure activities and incorporating this knowledge into decisions and negotiations before, during, and after implementation are valuable for planners and designers. The key may be in understanding the negotiations necessary between motivation to attend open space and the increasing constraints to doing so, as experienced by older adults. The need to understand motivation toward social interaction for older adults may be critical for planners and designers; in some cases, more important than an understanding of the physical needs (Loukaitou-Sideris et al., 2014).

The study intends to answer the following questions:

- What are the factors that promote open space access among older adults?
- In which ways are older adults motivated to engage in open space?
- How can open space provision, policy, design, and management processes cater to the needs and motivations of older adults to increase visitation?

**Scope.** The overarching aim of the research is to investigate older adults over age 65 and their motivations for visiting parks and open space. In addition to understanding this diverse social group and their motivations, the research seeks to identify ways in which planning and design disciplines can use this knowledge to develop open spaces that are more conducive to older adult visitation. The critical need for this research is to address the low open space visitation rates observed among older adults by comprehending which open space elements generate higher visitation rates in this demographic. Projected rates of population increase in this demographic make this a critical study toward developing environments conducive to older adults and their specific age-related preferences.

The data collection was undertaken in Perth, Australia; a city characterized by cultural diversity and a high percentage of open space per capita. This location is the first step in a broad research stream aimed at comparative studies across different sized cities, urban versus rural locations, and across countries.

The research employs a mixed-methods approach incorporating surveys and semi-structured interviews with older adults aged 65 and over, to determine if the older adults' open space needs are fulfilled, the reasons for fulfillment/non-fulfillment, and ways in which open space needs can be addressed in the future. The results of the data analysis guide the formulation of survey scales completed by 1000 individual park users and non-users, both below the age of 65 and those aged 65 and over, to determine the relative relationships between open space, the resulting fulfillment of needs, and revisitation of open space.

In the chapters that follow, I begin with a review the literature. I start by reviewing the impact of age on open space access for older adults, covering physical, cognitive, and aesthetic

considerations. Next, I review the literature addressing issues of gender differentiation in open space access and also consider concerns of social roles, safety, and resources as they relate to the divergence in experience of open space between men and women. Then, I review the literature on culture (primarily captured by race and ethnicity) and the documented disparity in open space access, reviewing concerns in open space management about open space location, financial capacity, culture, and language aptitude. Lastly, I review literature pertaining to issues of access across symbolic, physical, social, and psychological realms. Consequently, I develop a model of Open Space Motivation to Access (See Figure. 1, page 43) through a review of the literature pertaining to motivation and offer propositions to guide the research.

The next chapter outlines methods used for preliminary interviews, surveys, and final interviews. This chapter details methodology for data collection for the interviews and survey, provides preliminary interview findings, and outlines scale development for surveys. The subsequent chapter discusses the results of the quantitative analysis, considering the importance of psychological needs, as well as the attributes of open space contributing to need fulfillment. The following chapter discusses the findings from the interviews, which reveal insights about the post-retirement life stage, psychological experiences of older adults visiting open space, and elements of older adult experiences informing age-relevant park planning, policy, and design. The final chapter provides recommendations for theory and practice about the provision of age-friendly parks, and ends with a discussion of research limitations and opportunities for future research.

# CHAPTER 2: LITERATURE REVIEW

The conceptual framework for this study draws upon literature pertaining to age, gender, culture, access, and motivation. Literature has suggested that public space is experienced differently by various age and gender groups and by individuals from different cultural backgrounds. Although the focus here is on older adults, literature on gender and culture informs the specific sources of and reasons for the different experiences, thus leading to specific implications for theory and practice. As I will show, many of the differences in experience stem from motivational origins. Hence, a dominant motivational theory in the psychology literature – self-determination theory - will also be reviewed in conjunction with development of the research model in the next chapter. This literature helps us understand the ways in which motivation is generated, and how this knowledge can guide appropriate actions to increase open space visitation among older adults.

## i. Age

In which ways does aging bring about fundamental changes in an individual's physical abilities, cognitive processes, motivations, and needs in relation to interactions with open space? These changes not only make older adults very different from those in their younger years, but also require a different approach to the creation of their environment. Age produces many changes to physical and cognitive capabilities in older adults and, when combined with the complexities that ability, racial or cultural characteristics, or gender create, older adults become one of the least homogenous of all social groups, leading to more complexity in planning, policy, and design outcomes. Comprehension of these changes and the ways in which they can be addressed is critical to the provision and design of appropriate environments that support the

older adult. A review of the literature on aging addresses many of these changes and provides insight into the reality of the older adult's life.

With respect to park usage, older adults are as eager to enjoy the outdoor environment as are their younger counterparts, and perhaps more so since retirees often have greater leisure time at their disposal. The demand for park use, therefore, is likely to increase significantly, along with the increasing percentage of the population occupied by older adults, even though at the moment, older adults are underrepresented in parks. According to the Australian census statistics from 2010, adults over the age of 65 occupy 13.5% of the population with an anticipated projection to reach 22.7% by 2050 (Commonwealth of Australia, 2010). Similarly, United States census statistics from 2010 reveal that persons over the age of 65 years constitute 13% of the population (U.S. Census Bureau, 2011) with projections indicating an expected 24% of the entire U.S. population to be 65 years and over by 2060 (U.S. Census Bureau, 2015). The increase in demand for the use of parks is likely to exceed this predicted increase for the following reasons: 1) older adults, especially those with disabilities, may not visit parks on their own but will be accompanied by members of their families or other caregivers; 2) older adults have more time at hand, and are likely to visit more frequently, if their initial experiences are positive. However, whether or not the older adults will be able to enjoy parks will be determined by the type and quality of access and the type of environmental design and services afforded to them (Mullick, 1993).

To illuminate some of the lived reality of an older adult, Environmental Press Theory (EP) was developed in the early 70's by environmental psychologist and gerontologist, M. Powell Lawton. EP is a theory of adaptation focusing on competencies of an older adult and the interaction with environmental variables; a consideration of forces in the environment that evoke

a response when paired with the competency need of an older adult individual. Competencies may include both physical and cognitive health and functioning, but also personal sense of efficacy and mastery and quality of life. EP can be applied to the home or social environment, and also the broader context of the neighborhood (Lichtenberg et al., 2000).

The primary consideration of EP is the fit between the competency of an individual and the demands of his/her environment, providing an understanding of how well an individual is functioning. For example, an older adult who has been hospitalized for a disability is considered to be adapting and increasing his/her competence levels appropriately if he/she regains functional abilities and is able to resume living independently. Lawton (1985) acknowledged that declining functional competencies would also affect environmental press, as occurs readily with older adults and their competencies in visiting parks and open space. In addition, the precursor to EP is the "environmental docility hypothesis," (Lawton and Simon, 1968) which suggests greater proportions of behavioral outcomes are accounted for through environmental press as personal competence diminishes.

The gerontology literature also addresses older adult needs for personal autonomy in addition to competence, attesting to the continuing importance of this need in consideration of older adult well-being (Schulz and Brenner, 1977). Research has addressed the importance of autonomy for older adults, citing evidence from cross-national data that the majority of older adults prefer living independently rather than with a non-spouse relative, even when widowed or divorced (See Lawton, 1982, p.164).

Society in both Australia and the United States is becoming increasingly older and more ethnically diverse (Greller & Nee, 1989; London & Greller, 1991; Special Committee on Aging,

1991), but much of the park and recreation research has focused on young, White, middle and upper middle class individuals (Tinsley et al., 2002). Despite significant and increasing demographic changes, scholars have been slow to investigate the leisure behavior of older adults. There are limited empirical studies examining the psychosocial benefits of leisure of older adults as compared to other social groups (McPherson, 1991). In addition, limited investigation has been undertaken to understand the connection between behaviors of older adults and the implications for practice relating to open space, leaving policymakers in search of input toward the design of outdoor spaces for this demographic (Cranz & Young, 2006). This dissertation addresses these shortcomings.

The duration of the aging process exposes the individual to different biological, psychological, and social ramifications. Physical deterioration takes place with age. The sense of touch begins to diminish from early childhood, hearing begins to decline slowly in the 30s, and vision problems begin in the 40s. There are numerous other aspects of aging, including declining strength, slowness in performing tasks, problems with grasp, movement and force application, incidence of arthritis, and fear of falling (Mullick, 1993). Comparisons of preferences for activity across age groups indicate slow preferential changes, suggesting that the slowness of the aging process allows aging persons to adapt themselves to declining capabilities. Yet, when disability becomes an issue, either physical or cognitive, eventual preferences change quite significantly and rapidly. Consequently, the physical abilities and mental conditions of older adults vary significantly from younger disabled individuals who may have suddenly become impaired from an illness or an accident.

Research has indicated that many older adults experience a reduced quality of life (Steinmetz, 2006) which corresponds with decreased psychological health and increased

prevalence of depression. Estimates provided by the National Institute of Mental Health (2008) indicate diagnoses of clinical depression in 2 million Americans aged 65 and over, with similarly high rates of anxiety and suicide ideation, both being associated with diminished psychological wellbeing (Vanderhorst & McLaren, 2005). Factors leading to the reduced psychological state experienced by older adults are generally specific to their age range and include loss of friends and family, and diminished health, mobility, and self-confidence (Hybels & Blazer, 2003).

The design of an environment must encompass plans that are responsive to the declining capabilities of older adults. These designs must be in the form of developed plans that are sensitive to the functional needs of the users, aesthetic requirements of the surroundings, and ecological compatibility with the immediate environment (Mullick, 1993). Previous quantitative studies converged upon the positive relationship between presence of nearby destinations and older adults' walking for transportation (Frank et al., 2010; King et al., 2011; Salvador et al., 2010). However, a recent systematic review of quantitative studies (Van Cauwenberg et al., 2011) revealed inconsistencies in findings regarding other environmental features and older adults' physical activity (e.g. quality of sidewalks, access to parks, availability of sport facilities, etc.). Here I review physical, cognitive, and aesthetic elements that are unique to older adults.

**Physical Elements.** Older adults share many attitudes and values in common with other groups, yet regularly exhibit unique needs and perceptions of an open space system. For example, research conducted on open space use patterns found that older patrons of open space were less likely than teens and younger adults to engage in mobile activities, such as bicycling and jogging, and more likely to engage in stationary acts, such as sitting on benches and playing board games (Hutchinson, 1987, 1994).

A walk through the park is the most common physical activity undertaken by older adults. Models relating to the design of open spaces to promote walking for older adults tend to focus on enhancement of such spaces as a potentially effective way to promote participation in walking (Sugiyama & Thompson, 2008). However, exploration into variation in preferences and the roles of other environments, such as natural environments, has received little attention (Gobster, 2005). It is these seemingly contradictory findings that generate the need for further research to discover what older adults truly require for successful access to open space locations and activities, and how they intend to utilize these spaces.

Positive health benefits of interaction with open space and the resulting levels of physical fitness have also generated recent concern relating to use patterns in outdoor spaces by older adults (Cranz & Young, 2006). The benefits derived by older adults from these pursuits include different health benefits than those experienced by their younger counterparts, including better sleeping patterns, less pain, decreased urinary incontinence and verbal agitation, better recovery from disability, and even increased longevity (Connell et al., 2007; Fujita et al., 2006; Jacobs et al., 2008; Takano et al., 2002). However, the factors influencing the utilization of open space by older adults are different from those of their younger counterparts, leading to a different combination of these factors contributing to physical benefits. In a longitudinal post-occupancy evaluation study of an open space courtyard designed specifically for older adults in an elderly housing project, researchers transcribed interviews with older residents indicating lack of access to certain areas of the outdoor facilities. Reasons cited included too much pedestrian traffic and little privacy, not being able to use the space if the sun is too direct and the temperature is too hot, and lack of shade (Cranz & Young, 2006). Yet, research has also indicated that short periods of rest in outdoor settings play a role in increasing powers of concentration in older adults,

yielding a positive relationship with the performance of activities of daily living (Ottosson & Grahn, 2005).

Other research has shown that a primary benefit of interaction with open space for older adults is an immediate sense of pleasure and an opportunity to engage in simple, non-challenging activities without extensive planning or the necessity of a long-term commitment (Tinsley et al., 2002). Yet statistics suggest that in Western countries, only 30-40% of those aged 65 years and older engage in the recommended 30 minutes of physical activity per day (CDC, 2012; European Commission, 2010). Older adults also value the opportunity to be with other people, get vigorous physical exercise, escape feelings of obligation, follow a familiar routine, have experiences that are missing from their typical daily life, experience cognitive or aesthetic stimulation, and encourage/help others (e.g. Cranz & Young, 2006; Sugiyama & Thompson, 2008). The preference for more passive pursuits was found to also be true across ethnic groups with research conducted on an urban Chinese American community, finding that the biggest differences in activity preferences were by age (Zhang and Gobster, 1998). The study found that young people (13-18 years) were much more likely to prefer active pursuits (e.g. tennis, basketball, running, volleyball, cycling), with adults (19-60 years) and particularly older adults (over 60 years) exhibiting higher preferences for passive activities (e.g. tai chi, traditional Chinese exercise, walking, sitting).

Active pursuits can be considered to be a relative term. Age, physical condition, and cognitive strength all contribute to one's ability to determine if an outdoor pursuit is active or passive. For example, walking is considered to be the easiest and one of the more contributory outdoor pursuits for older adults, and yet previous results show a limited rate of participation in this activity (Sugiyama & Thompson, 2008). Research on older women has shown that walking

produces positive effects on their cognitive functioning (Yaffe et al., 2001). Research also shows that daily walking has a negative association with depression (Mobily et al., 1996), which is known to be one of the most frequent mental problems among older adults (Blazer, 2003).

**Cognitive Elements.** The U.S. National Institute on Disability and Rehabilitation Research estimates that there are 34 million individuals (over 14% of the total U.S. population) with some type of major physical or cognitive disability that "severely limits them in one or more major activities" (Ficke, 1992, pp. 5). When considering older adults specifically, there is a large percentage of disabilities that are attributable to this group, both physically and cognitively. Of the cognitive disabilities experienced by older adults, reports indicate that nearly 10 percent of all people aged 65 and over, and up to half of those over the age of 85 are thought to suffer from some form of dementia, most commonly Alzheimer's disease, with approximately 360,000 new cases occurring each year in the United States (Geriatric Mental Health Foundation, 2014). Like others, people with dementia find it important to engage in activities, and this engagement is commonly reported as a central force in their lives (Duggan et al., 2008; Phinney et al., 2007). Consequently, people with dementia value continuity in their daily lives, similar to that experienced before their diagnosis (Öhman & Nygård, 2005). This includes activities outside their homes such as visiting shops, post or bank offices, and parks, most often within close walking distance from home (Duggan et al., 2008; Mitchell & Burton, 2006).

However, many public spaces may be inaccessible for people with dementia because they regularly feel disoriented and have difficulties navigating and interpreting the environment (Blackman et al., 2003), even in familiar settings (Sheehan, Burton, & Mitchell, 2006). Fear of not finding one's way outside the home, including fear of using public transportation, can result

in people with dementia avoiding performing activities necessary for their physical and psychological well-being (Nygård & Starkhammar, 2007).

To date, literature on accessibility for persons with dementia has focused on the architectural planning and interior design of care facilities. The type of public space that seems to have been most often studied with relation to dementia is gardens at care units (Day, Carreon, & Stump, 2000). Yet this is clearly not the only public space that may be important to older adults with dementia. Lately, there have been efforts toward making public space "dementia-friendly" – that is, making it distinctive, familiar, safe, comprehensible, comfortable, and accessible (Mitchell & Burton, 2006; Mitchell, et al., 2003). For example, the Portland Memory Garden (part of the larger Ed Benedict Park in South east Portland) is one of eight parks across the U.S. designed specifically for people with Alzheimer's disease.

The results of a study conducted on individuals with dementia indicated that environmental stimuli caused subjects to choose less demanding activities in their regular daily routine to avoid upheaval (Brorsson et al., 2011). Many of these stimuli would not provoke or confuse the cognitively competent person. The authors of this research used the metaphor of a kaleidoscope to describe the changes in daily routine. The kaleidoscope may illustrate accessibility as the constantly changing experience where the small loose objects may be illustrated by categories, properties, and dimensions. When one or more of them was changed, a completely new experience of accessibility occurred for the cognitively disabled person with dementia or Alzheimer's disease.

As public space and accessibility for the disabled have been viewed primarily from a physical point of view with the focus on accessibility for persons with physical limitations, there

is a lack of knowledge concerning how people with cognitive disabilities (and more specifically those with Alzheimer's disease and other forms of dementia) experience accessibility when performing activities in public space (Brorsson et al., 2011). Many questions remain. For example, which features cause over-stimulation or confusion? Which make open space seem more safe, legible, and comfortable?

**Aesthetic Elements.** Research has found that well-maintained aesthetically appealing spaces, primarily those containing natural elements and attractive structures, indirectly facilitate older adults' physical activity (Moran, et al., 2014). Findings suggest that landscaping is a source of pride and interest for older adults, even if they only engage with it visually (Cranz & Young, 2006). Conversely, areas exhibiting maintenance neglect may discourage physical activity while also increasing fear associated with crime and uncertainty (Foster & Giles-Corti, 2008). Other factors noted in research of activity levels and environmental deterrents include acoustic disturbance through excessive noise, which can decrease the desire to physically engage and interact in open spaces (Cranz & Young, 2006). Still, other research has indicated that the quality of direct interactions with open space, such as aesthetic or acoustic appeal, may well be secondary to more functional elements such as adequate pedestrian infrastructure, access to facilities, or physical and emotional safety; however, this has not been confirmed through field research. These studies indicate that there is a hierarchy of needs with functional access being more important than visual access in encouraging physical activity, yet consideration of the aesthetic elements is still important to older adults (Alfonzo, 2005).

**Deficiencies in Current Research.** One of the greatest gaps in the open space literature (based on percentage of population) is that pertaining to older adults (and different sub-segments of older adults) and their experience with open space. Studies have recognized the particular

issues that adult open space users have to deal with as they age, the most common of which is increasing physical constraints and dementia. Studies have suggested that older adults are one of the most diverse social groups, yet there is little research to explain why and in which ways they are diverse. In addition, there is limited attention given to how specific elements of environmental design can be used to encourage outdoor use by older adults.

A few studies do exist that consider how environmental features may encourage physical activity (for example, Joseph et al., 2005; Michael et al., 2006), but there is virtually no recognition of the specific ways in which we need to begin catering to this social group in our outdoor built environment, from both physical and cognitive perspectives. Other studies have developed design guidelines to improve usability of outdoor space (Berentsen et al., 2009; Cooper Marcus, 2007; Grant & Wineman, 2007; Regnier, 2012; Zeisel, 2009). These studies and guidelines note the importance of components such as outdoor walkways, activity spaces, and indoor-outdoor connections, but fail to note the specific environmental features that encourage outdoor use and *why* they might encourage visitation to open space, more specifically (Rodiek & Lee, 2009). To address this documented shortfall in knowledge, Bedimo-Rung et al. (2005) have called for research that operationalizes relevant characteristics of open spaces and tests the associations between physical activity levels and these specific characteristics. This is an area requiring urgent research into preferences and experiences, as older adults become a larger percentage of the population.

### ii. Gender

Are encounters with open space experienced differently by women versus men, are there gender-specific open space needs, and how do these needs differ? Research has acknowledged

that space continues to be theorized from the premise of the universal male norm, where women are generally regarded as the 'other' (Massey, 1994). Correspondingly, the United Nations Population Fund (UNFPA, 2007) confirms that men and women experience urban living differently, often resulting in more barriers for women to access services and public spaces. Unfortunately, these inequalities continue to widen with increasing urban population growth and unsustainable development patterns (UNFPA, 2007; Wright Wendel et al., 2012). Typical constraints to leisure participation for women include fear of violence, lack of time, lack of transportation, and low self-confidence (Henderson, Bialeschki, Shaw, and Freysinger, 1996).

**Role-based Concerns.** Research suggests that leisure constraints for women are not based simply on biological factors, but are also a function of cultural interpretations of gender (Jackson & Henderson, 1995; Scott & Jackson, 1996). Women's leisure is often viewed as an extension of family roles involving caring for children and household chores (Deem, 1986). Given this, there is little wonder that women suffer more constraints to leisure participation than their male counterparts.

In studies testing this belief, female informants indicated that their perceptions of themselves are gendered (Scraton & Watson, 1998). That is, many women see themselves as 'mothers' or 'older women' in enacting a gendered social role, whether or not they are in paid work and whether or not they have the support of a partner, boyfriend or husband. For younger women, even when they talk about their own time and leisure that is separated out from their childcare responsibilities, there is still a sense of being a mother in relation to using public space. For the young mothers in the study, the meanings they attach to public space and their leisure are derived from their identity as mothers and defined in relation to how they use public space with and/or for their children. For example, schools, shopping places, parks and leisure centers all

feature as public spaces and sites they utilize both for leisure and for obligatory day-to-day requirements. Questions remain as to how these role-based concerns might change over the course of a woman's life. Do they remain pertinent among older women? For example, caregiving duties of younger mothers may transition to caregiving for an ailing partner in later years, but how does this modification in roles change the way older women use open space?

**Safety Concerns.** For women, open spaces are often perceived in terms of safety and the possible threat of male violence. This has been explored in previous studies on women's experiences of leisure (Deem, 1986; Green, 1987; Taylor et al. 1996). Geographers have researched how women 'map' certain places mentally in relation to their fears of possible male violence (Valentine, 1989). Many of the women in these studies talked about how they plan or 'map' their routes in the city, making decisions based on safety and risk. The younger women in the Scraton & Watson (1998) study referred to safety more in terms of sexual attack. Fortunately, they talked about the attacks being more likely to be verbal rather than physical.

Women were also more likely than men to see the forest or natural environment as threatening, and expressed a preference for park manager presence and developed settings as compared to the less management and more remote natural settings preferred by men (Virden & Walker, 1999). What remains to be determined is how these safety concerns might manifest in older women. Will they be exacerbated to the point of prohibiting visitation? Studies have been conducted on the issue of safety in an Australian context, yet results were not found to be statistically significant (e.g. Booth et al., 2000).

**Resource-based Concerns.** In contrast to the issues faced by a large percentage of women, higher incomes, greater education, and higher occupational statuses are positively

associated with leisure participation (Burdge, 1969; Kelly, 1987). People who do not possess these characteristics are likely to have more constrained leisure opportunities. Because they have less access to these resources, women are more constrained when seeking opportunities to engage in leisure as compared to men (e.g., Henderson, Bialeschki, Shaw, & Freysinger, 1996; Henderson, Stalnaker & Taylor, 1988; Jackson & Rucks, 1995; Shaw, 1985; Shaw et al., 1991).

Interviews conducted on this subject revealed the presence of more barriers for women due to limited mobility, the need to care for children, and significant domestic responsibilities (Wright Wendel et al., 2012; Loukaitou-Sideris, 2016) – a finding also noted by the United Nations Population Fund (UNFPA, 2007). Men, who represented the majority of users of open space in the research observations, have greater mobility and fewer domestic responsibilities, thus allowing them to use open spaces more freely, either alone or socially. As a result, smaller open spaces usually provide amenities for children and ease of surveillance of their movements, which allows women to relax, socialize, and take a break from their daily responsibilities. As one female respondent commented, "everyone has their own particular way to relax; in their own manner, at their own convenience, because we all have different tastes" (Wright Wendel et al., 2012, p.280).

In support of this, another study found that women were more likely than men to be engaged in stationary activities associated with child care and in activities as a family member or as a member of a mixed social group (Hutchison, 1994). Men were more likely to participate in mobile activities such as sports and walking, and to do so as individuals or with peers. Again, what remains to be understood is whether resource concerns diminish with age or remain a factor in visitation.

**Deficiencies in Current Research.** The social group receiving perhaps the slimmest attention in the literature is that encompassing females generally; more so, those females aged 65 and over. The literature has long acknowledged that the planning and design fields are dominated by males. Studies have noted that females use, perceive, and experience open space very differently. The very real fears experienced by females in the built environment, along with the social roles they are expected to fulfill (such as child rearing), create a very different experience for females than for males. Studies have begun to investigate the lived experiences of females in the public realm, yet the research has not progressed far enough to consider differences across age demographics or country specifics, thereby reducing the ability of planners and designers to formulate ways in which these experiences must be catered to.

The review of the open space literature reveals a focus on specific aspects of open space use patterns and preferences that neglects the experience of women, who are peripherally studied at best, or simply not acknowledged at worst. Further, more focus is placed on urban experiences than those in rural locations. The literature also tends to focus primarily on the experiences of the dominant group; a greater focus on the "other" social groups that are found in society would be greatly beneficial to built form as would a continuation of focus on those aspects of female experience.

At the same time, it is not just the female experience that must be studied, but also places and their impacts on the female experience, a reverse causality of sorts. We must also begin to consider not only access, but the actual usability of spaces once they have been accessed. These places and their impacts are generally the result of practitioner approaches to the provision and design of built form, unfortunately based frequently on outdated policy and theory.

Regardless of the nuances alluded to here, a change in the demographic proportions of older adults along with the recognition of gender and other differences should lead to a change in preferences for the way our built form is structured, used, and experienced. We need to understand how our communities are changing, and develop a discourse to address changes and also inform practice and policy-making. Interactions among age, gender, and culture are a cornerstone of increasing this understanding.

### iii. Culture

Research has suggested, observed, and verified extensively that different cultural groups have different values, needs, and preferences in regards to open space. The most general view of culture is that it is a set of characteristics common to a group of people (Erez & Earley, 1993). The definition of the group could be based on nationality, country of birth, race, ethnicity, or many other variables and defining characteristics. Scholars operating within the subjective culture tradition (e.g. Triandis, 1980, 1993), suggest that the focus of a cultural analysis should be dependent on the particular context and what is most salient in that particular context. Many studies in planning and geography have focused on the disparity that exists across cultural groups, primarily along racial and ethnic dimensions, with regard to open space access (e.g. Gordon-Larsen et al., 2006; Powell et al., 2004; Wolch et al., 2005; Moore et al., 2008). These disparities have been described as pertaining to location, financial concerns, values, language, and park management concerns. These are reviewed below; however, note that there is a growing interest in other cultural groups, such as those defined by country of origin and how people from different countries may have different open space preferences.

**Location Concerns.** A prior study undertaken in Chicago reported disparities in access to parks across neighborhoods of varying socio-economic status (Gobster, 2002). This study further reported that racial/ethnic minorities must travel longer distances than White residents to use open spaces. Another study in Los Angeles found few parks in socioeconomically deprived neighborhoods in the Los Angeles area (Wolch et al., 2005). However, a study in six cities in Illinois did not find a consistent relationship between park access and the number of racial/ethnic minorities in those six locations (Zhou & Kim, 2013). Instead, this study revealed that people living in residential areas with higher proportions of African Americans had more access to nearby parks; however, they noted that urban parks are more concentrated in the central part of those cities, where more African Americans dwell, indicating that an analysis of accessibility and actual use would be beneficial. Given the evidence reviewed previously about age and the importance of proximity of open space, important issues arise. Are older adults of color even more severely disadvantaged than their younger counterparts? Do differences exist across national boundaries and what can be done to reconcile this?

**Financial Concerns.** Many researchers have overlooked how the social construction of nature has become integrated in park landscapes (Castree, 1995; Perkins, 2011), and how these ideologies have impacted historical socio-spatial processes of park development (Pincetl, 2003). Byrne (2012) notes that leisure researchers have discounted racialized power-relations and their impact on the structure of residential location, property tax revenue, service provision, and park maintenance, which in turn can foster landscapes of social exclusion and even violence (Byrne et al., 2009; Dahmann et al., 2010; Gearin & Kahle, 2006; Rocheleau et al., 1996).

For example, one study observed that implementation of user fees at a site could result in a disproportionate decrease in participation for one ethnic group over another (Bowker &

Leeworthy, 1998). The issues of equity and distribution of benefits associated with pricing policies have previously been raised regarding local and nonlocal use of recreation sites (Walsh, Peterson, & McKean, 1989). Such issues relating to fairness, equity, and the distribution of benefits and costs will continue to be important in future recreation management and environmental planning, particularly in regard to underserved groups such as minorities and older adults. However, Ruffolo & Buttice (2014, p.17) have identified that some park supporters feel that taking the cost of service into consideration when setting park fees runs counter to the "collective movement that established the extensive system of public lands." Others have expressed concerns about parks departments changing roles from stewards to business operators, and worry about the loss of commitment to the natural resources, to underprivileged users, and to future generations (Ruffolo & Buttice, 2014).

Correspondingly, other studies have revealed consistent evidence showing that these disparities explain physical activity and obesity levels in poor communities of color (Gordon-Larsen et al., 2006; Powell et al., 2006). Further studies have indicated a similar disparity in public spending on open space in less affluent communities (Wolch et al., 2005). Concerns over poor environmental quality are deemed to be likely barriers to physical activity and engagement with open space in these communities (Boslaugh et al., 2004). Scholars argue that such circumstances represent an environmental justice concern requiring critical examination and corrective action (Floyd et al., 2009). Given that older adults often face financial constraints and frequently live in areas with less easy access to open spaces, these issues may be exacerbated as people age.

**Value-based Concerns.** Literature in recreation and leisure science indicates cultural differences in recreation behavior (Bowker and Leeworthy, 1998). Reasons for park use are as

varied as the reasons for their non-use (Gold, 1977). Significant reasons for not using a park are "I don't have time," or "it's too far away." Some claim "it's not big enough," or "I can't afford the entry fee." Other reasons, far less obvious, are users' fear of discrimination, being subjected to unfair or one-sided park programming, or even perceptions that the park is unwelcoming or unsafe. Some of these reasons are even interrelated and therefore strengthen each other (Byrne, 2012). The emerging body of literature on the cultural politics of nature offers alternative and persuasive explanations for park non-use, frequently citing minority cultural preferences and observed patterns of use (Floyd, 2001; Irwin et al., 1990; Sasidharan et al., 2005; Tierney et al., 2001).

For example, Kaplan and Talbot (1988) reported that Whites favored a more natural and less developed environment, and African Americans favored more developed sites. In studies examining the outdoor recreation activities of ethnic minority groups, Blahna (1991, 1992) found through an on-site survey (1992) that Asian Americans and other minority groups traveled further to reach a metropolitan area state park to fish than White Americans. They also tended to fish the developed river site in the park, while White Americans tended to fish the rustic, walk-in lake site. Zube and Pitt (1981), Zube (1990), and Loukaitou-Sideris (1995) also report findings of cultural differentiation in the use of open spaces.

Typically, park research treats parks as 'spatially-fixed' or 'self-contained' locations, rather than being connected to a greater urban network of spaces (Jessop et al., 2008). This treatment reduces the ability to holistically integrate and analyze the many explanations behind the non-use of parks based on ethno-racial grounds (Boone et al., 2009; Byrne & Wolch, 2009; Loukaitou-Sideris, 1995; Loukaitou-Sideris & Stieglitz, 2002). Scholars have highlighted how the history of park development has incorporated aspects of White or Anglo ideals of nature,

therefore revealing the influences of one group on park design, facilities, management, and programming (Byrne & Wolch, 2009).

One study of visitors' perceptions of the Santa Monica Mountains Recreation Area revealed Latino park users identifying the area as an "American" or "Whites-only" park (Byrne, 2012). Likewise, reduced visitation rates among ethnic and minority groups at parks was evidenced in research conducted by Baas et al. (1993), indicating discrepancies in importance of site amenities and facilities among foreign-born and U.S.-born visitors of both White and Latino background. Their research indicated a preference by Latinos for a more developed environment, in contrast to that preferred by White visitors. Yet Byrne's (2012) interview transcripts reveal that there is a strong affinity with nature among the Latino population. Hence, it is not just the "minority cultural styles" that explain observed patterns, as many researchers have claimed (Floyd, 2001; Sasidharan et al., 2005; Tierney et al., 2001), but rather the question of how ideas of race and nature have worked together to instill natural spaces (like parks) with complex social and cultural meanings (Byrne, 2012).

Comparative studies offer two reasons why groups may or may not engage in a given activity in open space. The first is "marginality," and the second is "ethnicity" (Washburne, 1978; Washburne and Wall, 1980; O'Leary and Benjamin, 1982; Hutchison, 1987; Dwyer and Hutchison, 1990). The "marginality" theory proposes that historical repression has placed minority groups at the margins of society, resulting in lower participation in some recreation activities due to social impacts like discrimination, or economic hardships due to outlays of time, travel, or money. For example, researchers have found support for the marginality theory in data revealing that African Americans and some other racial and ethnic minority groups tend to recreate closer to home, and in activities that do not require high user fees or equipment

expenditures (Zhang and Gobster, 1998). Other research indicates racial discrimination to be a significant problem in minority use of urban parks, and one that might act as a barrier to greater participation (West, 1989; Blahna and Black, 1993; Gobster and Delgado, 1993). Finney (2014) addresses this issue by citing historical precedents relating to the first environmental movement initiatives in the early 1900s, when environmentalists such as John Muir and the Sierra Club involved themselves in the Hetch Hetchy Dam controversy in Northern California[1]. Finney (2014) also reviewed membership statistics from environmental clubs and found that in 1975, 98% of park volunteers were White, and most members of the environmental clubs are still white and middle class, with little change to diversity statistics through the 1980s and 1990s. Precedents embedded within examples such as this help explain the lack of connection of minorities to nature and open space.

The "ethnicity" theory proposes that distinct ethnic or subcultural preferences among ethnic groups result in differences in activity participation. Studies have found differences in the participation rates among racial and ethnic groups (Washburne & Wall, 1980). Although difficult to generalize, the literature suggests that there is often a lower participation among minority individuals in nature-based outdoor recreation activities, such as camping, and higher participation in some group sports, such as basketball or soccer, and passive social activities, such as picnicking (Zhang and Gobster, 1998).

Two additional explanations have be proffered in the work of Floyd and Gramann (1993). “Acculturation” is the process through which a minority group member adopts cultural

[1] The debate pitted environmental preservationists against the City of San Francisco over the proposed damming of the Hetch Hetchy Valley in Yosemite National Park for securing a stable water supply for the city. The involvement of the Club with Muir at the helm prompted other citizens to offer their voices to the issue. However, these citizens were predominantly White middle class men, who represented environmental clubs segregated by race and class.

characteristics of the dominant group. "Assimilation" is a related process through which a minority group member joins the society of the dominant group, interacting and participating in activities with the dominant group. In their study of Mexican American and White American households in Arizona, Floyd and Gramann (1993) found that Mexican Americans who were least acculturated or assimilated, participated in significantly fewer water/snow-based, urban, consumptive, and travel-oriented activities, and did so at fewer National Forest locations than White Americans or acculturated Mexican Americans. In earlier research, support was acknowledged for the concept of birthplace being used as a surrogate measure of assimilation, where data revealed that the more assimilated a group was into the host culture, the more similar would be the perceptions and recreation behaviors of that group to the host culture (Pfister and Ewert, 1991). Similarly, partial support was found for the influence of ethnic assimilation on perceived recreation benefits, activity participation, and site visitation (Gramann and Floyd, 1991). These results indicate that different management strategies may be necessary to reduce the impacts of exclusionary institutional practices in meeting the needs of groups with varying levels of assimilation (Baas et al., 1993).

As a case in point, consider Chinese Americans. Interviews with an urban Chinese American community illustrated their leisure preferences and open space needs as varying in the distinct meaning and significance of certain outdoor activities within the community (Zhang and Gobster, 1998). For example, when asked for their perceptions of what "relaxing" meant to them, Chinese American respondents indicated walking, people-watching, sitting, and chatting, with "relaxing" clearly the dominant outdoor recreation activity discussed in the interviews. Interestingly, the Chinese American respondents didn't consider "relaxing" as a leisure activity to be separated from non-leisure activities (Zhang and Gobster, 1998).

Similarly, Latino and other Asian cultures are both regarded as collectivist because of the greater emphasis given to the family unit and the importance of larger social organizations, while the typical White North American and Australian cultures emphasize more individuality and mobility. This contrast, as shown in research conducted by Tinsley et al. (2002), indicated that White park users were more likely to use the park alone or with a member of their immediate family, while Latinos and Asians were more likely to congregate in a group (Tinsley et al., 2002). In this same research, both Latino and Asian park users rated the need for affiliation or relatedness as one of the highest psychosocial benefits of park use. Also, at a group level, Latino and Asian park users rated exercise and self-enhancement as less important than other user groups, illuminating a significant divergence in park use preference than White cultures. Similarly, earlier research indicated that White park users were more likely to participate in active and wilderness uses than other cultures, suggesting that they ranked participation in outdoor activities differently (Washburn, 1978; Kelley, 1980; Stamps and Stamps, 1985).

Research conducted by Zhang and Gobster (1998) on urban Chinese American communities reveals subtleties in preferences resulting from the nuances of birthplace, duration of residence, and level of education among individuals from similar ethnic groups. Their research revealed that Chinese Americans born in the U.S. (second or third generation), were more likely to prefer active park use than those born in mainland China. In addition, activity preferences of the Hong Kong-born interviewees more closely resembled those of U.S.-born interviewees than those of mainland China born interviewees. Their research also revealed variations in respondents, who had resided in the U.S. for varying durations. “Newcomers” (those residing in the U.S. for 5 years or less), were more inclined to pursue active park use indicating an embracing of their new host culture. Interestingly, respondents who had lived in the

U.S. for longer than 5 years tended to prefer passive recreation and traditional Chinese activities (Zhang and Gobster, 1998). Similarly, the research indicated that those with more education preferred active park use, while those with less education preferred more passive and traditional activities. Nonetheless, age differences between the respondents may also help to explain the variations (Zhang and Gobster, 1998).

Low access and visitation can also result from institutional practices that restrict the appropriateness of services and programs offered in the recreation facility that cater to minorities. Other aspects of institutional exclusion relate to language skills of minority individuals and the personal discomfort it generates, which may be accentuated by the lack of multi-lingual signs and services offered in parks. Many participants in the Byrne (2012) study felt that the English language signage in parks was exclusionary and thus a constraint. Additionally, they identified the limited numbers of bilingual park staff as exclusionary. Several participants from diverse ethnic backgrounds also reported that they were reluctant to visit certain parks because there was limited Spanish-language information available about the park on the internet.

Cumulatively, this research indicates important interactions among different demographic characteristics, suggesting the need to understand varying needs and preferences among subgroups of older adults.

**Open Space Management Concerns.** The attributes noted above and their potential combinations and complexity result in unique recreation design and management challenges. Additionally, the type of park programs and amenities offered, visitor regulation and law enforcement, differences between visitors' and managers' attitudes, and frequent saturation of a

recreation site's resources also affect open space and park management (Ewert 1991). Implementing planning, design, and management activities is complicated by the ethnically diverse use that many open space sites experience. Visitors to these sites often speak different and multiple languages. Ethnic differences may also underlie differences in managers' and visitors' attitudes (Dennis and Dennis 1990). Visitors may not only misunderstand or be unaware of regulations, but may not want to accept them simply because their values and norms (cultural, religious, or civic) are not consistent with certain regulations (Clark et al., 1971), for example, regulations restricting group size.

**Deficiencies in Current Research.** Much of the design of open space is derived from an historical approach, one which has been shown to be inappropriate for today's ethnic mix. This social diversity creates a 'moving target' for scholars, policy-makers, and practitioners as many examples in the review have shown, leaving us with the realization that deficiency in theory, policy, practice, and social acceptance exists at almost every turn. We know racial and ethnic differences in access and use exist, but questions remain regarding the appropriate types of access that should be afforded to these groups, how we determine equitable distribution of open space, and ways in which this access can be socially, politically, and institutionally enacted.

Planners and policymakers must not only consider diversity among groups, but also diversity *within* groups. A cautionary example is provided by Rodríguez (2013), who introduces us to "The Latino assumption," which refers to the flawed belief that all descendants from Latin American countries and Spain who live in the U.S. and its territories belong to the same ethnic group, and therefore engage in leisure activities in the same way. One particular study emphasizes that the context within which people participate in recreation -- when, with whom, how and where -- is also critical, not only in the ways that the participants interact, but also in

their desire to participate in the first place (Kelly, 1974). Kelly further notes that while the choice of leisure activity is associated with its setting, it is not entirely controlled by it. More crucial influences must include the role of the family and patterns of social and cultural significance, because people adopt patterns of leisure in accordance with their total lifestyle (Roberts, 1989). Considering how cultural patterns of use interact with and are influenced by other demographics adds much complexity to theory and practice, but is critical to comprehend. A one-size-fits-all approach is destined to result in lower visitation. The research proposed here addresses these complexities to lend clarity to practice.

### iv. Access

Access to city amenities is unequally distributed among different social groups (Lynch, 1981, p. 190). For example, women traditionally tend to be relegated to household duties and may have less time to visit open spaces for their own enjoyment, small children are often restricted in the spatial range they occupy by watchful and protective parents, less-affluent individuals may be restricted by lack of personal transportation, low-income people (who often belong to communities of color) may be excluded from preferred locations for economic or other reasons, while the world of the older adults shrinks as powers of movement fail them (Lynch, 1981). Issues of access are not merely calculated by the location in which they occur, but also by the social group through which access to a location is desired.

The quality of access is not the critical criteria and therefore, the desired outcome in all circumstances, although many urban locations theories consider this to be self-evident. Variety is the key to social success in the built environment, suggesting that it is easier for an individual to

find an agreeable location or to become competent in new ways if environmental fit is appropriate. (Lynch, 1981).

Specific places generate unique meanings for people because of their social or cultural character and an individuals' transactional relationship with the place (Cutchin et al., 2003). Yet, we should try to understand all aspects of a place by asking how and why groups are visiting it, and how the space affects their social interactions and opportunities. Additionally, we should also evaluate people's ability to access and use a space (Krase, 2002). As has been argued:

> *"Different classes construct their sense of territory and community in radically different ways. This elemental fact is often overlooked by those theorists who presume a priori that there is some ideal-typical and universal tendency for all human beings to construct a human community of roughly similar sort, no matter what the political or economic circumstances"* (Harvey, 1989, pp.265).

The notion of human experience implies interaction and use of a place, and scholars believe that the difference between the concept of accessibility and usability should be noted and discussed (Iwarsson & Ståhl, 2003). According to Didón et al. (1987) usability is subjective and indicates how a person can perform activities in the public space, whereas Iwarsson & Ståhl (2003) suggest that accessibility is an objective matter. Further, it is known that accessibility is an essential precondition for usability (Letts et al., 2003). However, the findings of Brorsson et al. (2011) indicate a contrast; a shop may be accessible in an objective way with no physical obstacles, but all people may not be able to use the self-service check-out station. Their suggestion is to jointly use accessibility and usability, because in order to experience accessibility in public space, people also have to be able to use it.

Focusing specifically on open spaces, it is often suggested in the literature that these spaces may promote social cohesion through providing places for people to meet (Francis et al., 2012; Kweon et al., 1998), and, more recently, the possibility that a greener local environment can also assist in people getting healthier durations of sleep (Astel-Burt et al., 2013). If even just some of these reported benefits are apparent, promoting the availability and use of open space can be part of multi-sectoral initiatives aiming to reduce the burden of chronic diseases (Maas et al., 2009; Astel-Burt et al., 2014), promote longer, healthier lives, and narrow the health gap between rich and poor (Mitchell & Popham, 2008; Mitchell et al., 2011; Richardson et al., 2010).

The use of public open space was found to be strongly influenced by: quality and quantity of spaces; user socio-demographic characteristics; access to competing facilities; ability for amenities to match user needs; maintenance; and perceived safety (Giles-Corti et al., 2005). Scholars have observed that when evaluating public policy commitments like these (and others), it is not enough only to know what level of access to open space the "average" person enjoys. Rather, policy-makers want to know how access to public open space varies across all groups in society, and whether those who enjoy the greatest access include those who are most in need (Barbosa et al., 2007). A further consideration here must be the inclusion of how access to public open space varies across all locations in society. As previously noted, we cannot only consider access, but must also view usability. Similarly, we must consider not only how access varies across different social groups, but also how access varies in different locations and what enables or hinders that access.

The literature addressing access in the built environment is typically divided into realms of investigation considering symbolic, physical, social, and psychological access which, according to Bonilla (2013) affords representation of different meanings to different people.

Symbolically, public spaces act as creators of collective identity at the neighborhood, city, or country level (Carr et al., 1992; Francis, 1987; Low, 2000). Physically, public spaces represent communication channels in cities, expressing morphological, environmental, and aesthetic values (Krier, 1979; Lynch, 1960; Woolley, 2003). Socially, they can bind communities and promote culture (Carr, et al., 1992; Madanipour, 2003). They also serve as arenas for politics, conflict, political action, and negotiation (Deusen, 2002; Low, 2000; McInroy, 2000; Mitchell, 1995), and can at times play an economic role as settings for commercial exchange and as a medium for attracting investment around them (Francis, 1991; Madanipour, 2003; Shaftoe, 2008). Psychologically, public spaces contribute to mental health, and human and educational development (Jackson, 2003; Shaftoe, 2008; Woolley, 2003). Next, I elaborate further on these four realms.

**Symbolic Access.** The transformation of public open space symbolizes different meanings to different people. Through involvement, a strong bond is generated between people and their built environment and through action, visual involvement, and value attachment, people's involvement is enhanced and the symbolic nature of the space is amplified (Francis, 1989; Gehl, 1987). Bonilla (2013) notes that meaning is created and defined within this journey of public and open space transformation. Interactions, expression of identity, and communication in the public open space development process may help generate a sense of belonging to the urban realm.

The process of planning and designing the built environment often excludes public involvement. Yet, public involvement represents an important opportunity for planners and policymakers to understand the meanings and values associated with public open space (e.g. Matas, 1988 or Viviescas, 1997). Public involvement helps develop a sense of appropriation, advocacy, and feelings of ownership in the public (Bonilla, 2013). Feelings of ownership by the

public over open spaces develops an "eyes on the street" approach to urban management, discouraging antisocial behavior such as alcoholism and drug abuse. It is this involvement in the improvement process that symbolizes ownership and stewardship for the members of the public, leading to an increased level of respect for the spaces. Furthermore, promoters of public involvement in the creation of neighborhood parks believe these community spaces help to create a better society and contribute to the solution of many social problems, such as family violence, social disintegration, apathy and lack of interest in others, and a lack of family and community values. Hence, Bonilla (2013) views public spaces created under these conditions as places of integration and inclusion, belonging and attachment.

**Physical Access.** The issue of accessibility and usability was found to be strongly influenced by certain barriers, such as an individual's time, sense of safety, travel distance, and goodness of fit between open space amenities and user preferences. Therefore, despite the overwhelming preference for urban parks in a recent study, distance and time were found to be the primary barriers for using these spaces, and this was most apparent for outer suburb/district and lower-income residents (Wright Wendel et al., 2012). In general, open space users were found to prefer nearby, attractive, and larger areas; however, after distance was taken into account, size was considered more important than attractiveness for encouraging use in certain studies (Giles-Corti et al., 2005).

According to the Project for Public Space (2014), we can judge the accessibility of a place by its connections to its surroundings, both visual and physical. A successful open space is easy to get to and get through; it is visible both from a distance and up close, implying the importance of both physical and visual access. The edges of the space are important as well. For instance, a group of people picnicking in the park is more interesting and generally safer to walk by than a

blank wall or an empty parking lot. Accessible spaces have a high parking turnover and, are conveniently located in regards to public transit.

Further, successful open spaces strike a balance between preserving the natural environment and providing maximum use of the natural landscape, although this is not an easy outcome to achieve. Mullick (1993) holds the U.S. National Park Service (NPS) in high esteem in this regard as he believes they have done a superior job of balancing the need to preserve the environment and also maximize access for recreation and enjoyment. He does acknowledge, however, that various problems are likely to result from the upsurge in the number of individuals wanting to visit the national parks. First, the increasing number of park visitors and their eagerness to explore the natural territories is likely to add to the burden of the already fragile ecology of National Parks. Then, the demand for enhanced recreational possibilities will have numerous unknown social and environmental implications, and threaten the preservation policies of the NPS. Lastly, serious problems are likely to arise from human activities in natural areas, and this will seriously impact the natural quality of the landscape, which is the reason for people wishing to visit the National Parks in the first place. Accessibility to the National Parks, in particular, becomes even more critical considering the steady usage and increasing population of persons with disabilities (Mullick, 1993).

In addition to physical disabilities, access afforded to those with cognitive disabilities is even less defined:

> *"The types of design features for disabled people which tend to be incorporated into buildings include accessible toilets, ramps and level entry or access points. Little or nothing which addresses the needs of people with learning difficulties is incorporated into much contemporary building and design processes"* (Imrie and Hall 2001, pp. 97).

This indicates a severe deficiency in both scholarly pursuit and practice. Some scholars believe that in addition to the transformation of physical space along political and material resource lines, effective communication is a critical missing link towards the redefinition of policy and design practice that provides inclusive physical and programmatic benefits for people with learning disabilities (Mathers, 2008).

**Social Access.** The original form of traditional public space is under threat by the postmodern metropolis. The resulting new form of space created as a result of the postmodern city creates new social urban issues, such as increased public spectacle, in addition to the primary intent of attracting capital expenditure back into cities. Scholars have observed that these new forms of space are predominantly driven by high technology and the desire for instantaneity (Herzog, 2006).

As early as 25 years ago, a study in Madrid suggested that public spaces such as parks, plazas, and promenades were not used to the extent expected given adjacent populations densities. The author argued that public life in Spain was in decline, particularly within larger cities (Hauser 1991). The primary loss is that of a social interaction in public spaces, assumed to be in decline because of a preoccupation with technology and visual media, social media, or radio which pushes active discourse into the private realm (Herzog, 2006).

Similarly, technology has influenced park-makers in the U.S.. From the ecological perspective, technology has afforded the opportunities to change the landscape through rock removal, tree relocation, wetland filling, watercourse damming, and lake creation (Chadwick, 1966) which has displaced flora, fauna, and people, introducing new species and different ecological interactions to the 'urban pastoral' (Gandy, 2002). These ecological retrofits are evidenced in Central Park, New York, where Gandy (2002) argues that the values of family,

nature, and society, representing Jeffersonian ideals, are dominant and designed to communicate civilizing sensibilities in the newly created 'moral geography'. Byrne & Wolch (2009) state that park makers from that period typically constructed open space images as natural, sanctifying, wholesome, and White as a reaction against the profane, unsavory, and colored city (see Matless, 1998; Baldwin, 1999). Thus, gentrification was introduced to the industrial city, displacing vulnerable residents, many of whom were poor and colored (Baldwin, 1999; Taylor, 1999). The National Park system also reflected middle- and upper-class sensibilities of eugenicist ideologies and pristine wilderness (Mels, 2002) leading to the exclusion of Native Americans from lands designated for National Parks (Cosgrove, 1995; Spence, 1999).

These initial modes of open space discrimination are believed to lead to recently observed ethno-racially differentiated park use. West (1989, pp. 12-13) notes that "prejudice and overt discrimination in public parks together with perceived hostility lead people of color to avoid parks where they feel unwelcome" (see also Tierney et al., 2001; Floyd & Johnson, 2002; Gobster, 2002).

The typical park design is also believed to negatively impact many people's interest in participating in open space activity. Extensive research has indicated that many American parks have been designed according to Anglo-Celtic aesthetics (Rishbeth, 2001; Bedimo-Rung et al., 2005), which has the potential to repel foreign-born or non-White visitors (Loukaitou-Sideris, 1995; Loukaitou-Sideris and Stieglitz, 2002). Nast (2006) also contends that the presence of dogs in parks may negatively influence park perceptions and use among people of color.

Finally, park location and the composition of adjacent neighborhoods also lead to social exclusion. An example proffered by Byrne et al. (2009) evaluates one of the U.S.'s largest urban national parks, which lies just 8 miles from downtown Los Angeles. This park is surrounded by

affluent White neighborhoods which are deemed to act as a conspicuous social barrier to people of color wishing to utilize the park's amenities.

**Psychological Access.** Many scholars and practitioners believe that the key to success for parks is whether they are comfortable and present a good image to the public. Perceptions around comfort, including those of safety, cleanliness, and the availability of places to sit, affect psychological access to parks. The importance of giving people the choice to sit where they want is generally underestimated, as shown in the seminal work of William H Whyte (1980). The Project for Public Space (2014) observes that women in particular are good judges of comfort and image, because they tend to be more discriminating about the public spaces they use.

Additional facets of psychological access include the type of activities and programs offered in parks. Activities are the basic building blocks of a place. Having something to do gives people a reason to come to a place – and revisit. When there is nothing to do, a space will be empty and that generally means that something is wrong.

Open space vibrancy and encouragement of social interaction is an important quality of public open spaces. If achieved, it becomes an unmistakable feature that remains in the memories of visitors for extended periods of time. When people see friends, meet and greet their neighbors, and feel comfortable interacting with strangers, they tend to experience psychological comfort and a stronger sense of place or attachment to their community – and to the place that fosters these types of social activities.

These components also contribute to the reduction of crime due to the links identified between high crime rates, high levels of inequality, increased stress levels and substance abuse, and insufficient open space, which increases levels of boredom and idleness (UN-HABITAT,

2008). In fact, safety (or a lack of perceived safe conditions) was identified by Berney (2010) as a major barrier for potential users in most open spaces. Therefore, improving equitable access to desirable and safe open spaces can serve as one component of a larger effort to decrease crime and improve urban quality of life.

Psychological access becomes a significant factor when considering people with cognitive disabilities. Studies conducted by Brorsson et al. (2011) showed elderly people with Alzheimer's disease were frequently impacted by constant changes in their environment, thereby reducing the familiarity between informants and the space and therefore, their accessibility. As previously indicated, the concepts of space versus place are challenging. The informants in the Brorsson et al. (2011) study described different places that were important to them and, by doing that, they gave meaning to those places. The public space that the informants did not experience as meaningful or accessible and, therefore, were reluctant to visit was not described as "place," but rather as public space in general. This finding has implications for the definition and use of the accessibility concept.

Interestingly, Brorsson et al. (2011) also reported that none of the informants in their study considered physical health or age to have an impact on how they experienced accessibility, which would likely be the case for able-minded members of the general public. This indicates that it is important to understand how people with dementia or other disabilities experience accessibility, because people with or without disabilities obviously experience different challenges and place different accessibility demands on public open space. It is important to consider that people are different, and that therefore their relationships with public open space will also be different (Brorsson et al., 2011).

**Deficiencies in Current Research.** The review of the literature reveals a focus on specific aspects of ethnicity and open space use patterns and preferences at the expense of other aspects. The complexity of ethnicity presents a far greater challenge than can be addressed in one literature. The U.S. literature tends to focus on broad categorizations of race/ethnicity (such as White, Black, Latino, and Asian categories) at the expense of addressing more complex and nuanced preferences, behaviors, and outcomes that may exist within these groups. A greater focus on the social groups that are found within all ethnicities, including those of White or Anglo origins, would be greatly beneficial.

Although, it is not just the people that must be studied, but also places and the relationships between the two. Lynch (1981) notes that there is a significant base of literature on which to base performance criteria in the built environment, although in many cases, having well-developed measures and commonly understood outcomes as the goal, there is a gap between these goals and the lived experiences of access experienced by many citizens (Lynch, 1981).

We must also consider not only access in our studies, but the actual usability of spaces, once they have been accessed. These places and their impacts are generally the result of practitioner approaches to provision and design of built form, unfortunately based frequently on outdated policy and theory. A thorough review of policy and practice guidelines, such as the Americans with Disabilities Act (ADA), is likely to be the best approach we have to effecting change in habit, leading to a greater acceptance of variance in members of the community for which spaces and places are built.

# CHAPTER 3: RESEARCH MODEL AND PROPOSITIONS

The literature reviewed in the preceding section suggests different patterns in open space access across age groups, genders, and cultures. These patterns can be explained by certain individual and group differences. For example, differences in cognitive, physical, and aesthetic awareness may be derived from variations in the way different cultures perceive beauty or safety. Role-based and resource-based concerns may result when comparing disparities in perceptions between affluent White individuals living in a safe, well protected community versus poor immigrant families with minimal shelter or financial support. Finally, preferences for location based on values-based or management concerns may generate comparative disparities when, for example, we compare open space use by a male American teenager who enjoys throwing a football with a friend to a young Korean female sitting under a tree conversing. A common thread across all individual and group differences is that they are associated with motivational processes that may lead to access and use or, in contrast, feelings of exclusion and nonuse of parks and open spaces. Yet, we lack a model which integrates motivational comprehension of park users with the latest research on access to open space.

This section develops such a model (as depicted in Figure 1 below). The key outcome that the model focuses on is open space revisitation, defined as the likelihood of someone visiting an open space again, following a first visit and use. The basic premise is that users will be motivated to revisit an open space that fulfills their needs, and that fulfillment of these needs rests on whether specific attributes of the space contribute to specific needs that users deem important. Given that the dissertation focuses on older adults, the model and associated propositions begin by identifying which needs are likely to be important for this specific group, recognizing possible interactions with other demographic variables, even though these may be

secondary. Next, I identify the elements of open space which are most likely to result in need fulfillment for this group. Finally, I elaborate on the relationship between need fulfillment and revisitation. Hence, I develop hypotheses in three sections that correspond to this model: (1) importance of needs, (2) elements of open space which result in need fulfillment, and (3) relationship of need fulfillment to revisitation.

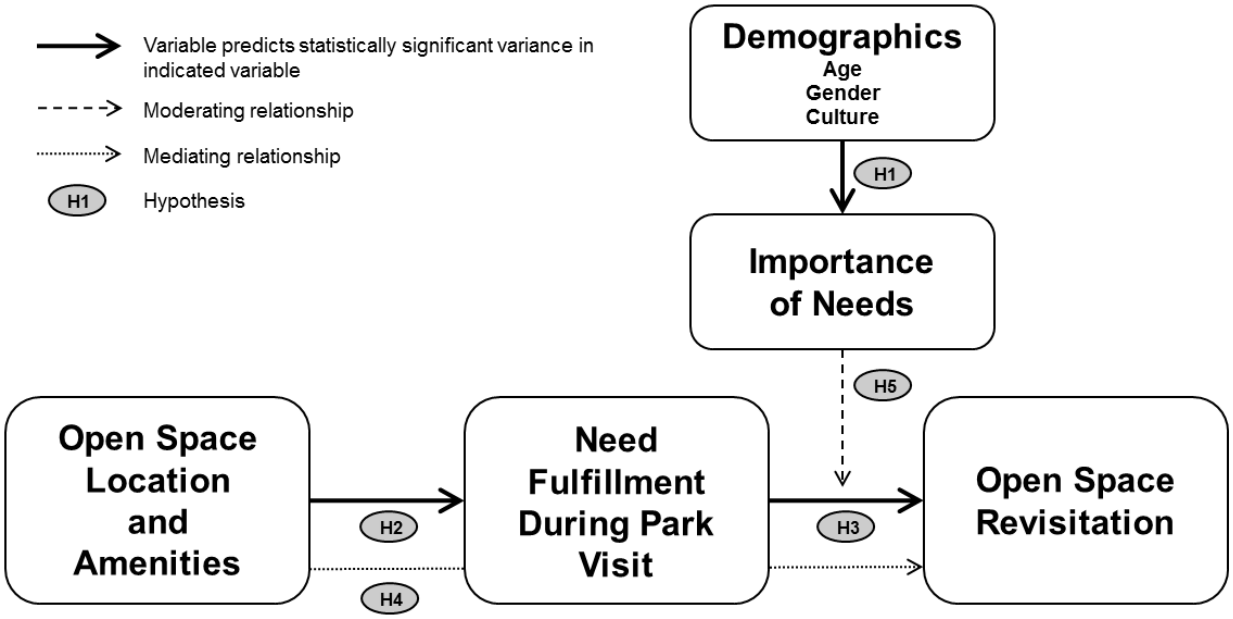



***Figure 1:*** *The Open Space "Motivation to Access" Process Model*

**Importance of Specific Needs.** Motivation is the stimulus to act toward achieving an end result or goal. This end result can be achieved through intrinsic motivation, which is the inherent interest or enjoyment experienced, or extrinsic motivation, referring to action guided by an outside stimulus such as a reward or a command (Ryan & Deci, 2000b). When intrinsically motivated, psychologists have found that individuals experience (1) more interest, enthusiasm, and self-confidence which results in enhanced performance, creativity, and persistence (Deci & Ryan, 1991; Sheldon et al., 1997), and (2) a heightened sense of vitality (Nix et al., 1999) and

self-esteem (Deci & Ryan, 1995), and that this leads to a generally increased sense of wellbeing (Ryan, Deci, & Grolnick, 1995). Research undertaken by Ryan et al. (1999), duplicated these U.S. findings in a sample of Russian respondents, indicating potential generalizability across cultures.

The level (i.e., how much motivation) and orientation (i.e., why the person is motivated) of intrinsic motivation varies among individuals. For example, if an older adult receives a recommendation to go to a park for physical exercise, that recommendation may not be appealing as many older adults consider physical exercise to be hard work and uncomfortable. If, however, they were encouraged to go to a park to see friends and have a lovely day in the sun watching the ducks at the pond, the result will be the same in getting them outdoors and active, but orientation will be different, yielding a different and more sustainable result, such as the likelihood of revisitation. Evidence suggests that it is not just the way in which we frame the intrinsically motivated activity, but critically, how the activity is framed in order to not only elicit engagement, but sustain it (Ryan et al., 1997). It is through an examination of both the real and perceived conditions that elicit and sustain activity involvement that motivation theory has a potentially large contribution to make to open space access and use.

For example, motivation is considered an integral component in positive leisure experiences (Iso-Ahola, 1979; Neulinger, 1974), and a primary element in leisure studies (Iso-Ahola, 1980). Further, motivation was shown to be an important determinant of the quality of the leisure experience (e.g., Graef, Czikszentmihaly, & McManama, 1983; Mannell & Bradley, 1986; Tinsley & Tinsley. 1986), and a better predictor of leisure fulfillment than merely participation (Deci & Ryan. 1985). Other studies have specifically highlighted motivation as an important factor to consider in determining leisure fulfillment and leisure participation among

older adults (Howe, 1987; O'Connor & Vallerand. 1990; O'Connor et al., 1992; Vallerand & O'Connor, 1989, 1991). Finally, a study conducted by Losier, Borque, and Vallerand (1993) supported the link between intrinsic motivation and variance in leisure participation in older adults by considering opportunities and constraints and their impact on motivation to participate and the resultant level of participation fulfillment. They found that when they are intrinsically motivated to participate in leisure activity, older adults perceive fewer constraints, participate to a greater extent, and yield a higher level of satisfaction from the open space visit.

Many theories of motivation indicate a central role for human needs (e.g. Losier et al., 1993; Ryan & Deci, 2000a). The concept of human needs has been defined variously across the psychology literature. Some scholars consider needs to be treated as individual differences, for example, with person "A" having a stronger need for an outcome than the need of person "B" for the same outcome. These individual variances in the strength of needs are assessed to predict motivation and the success of outcomes of an activity for an individual (e.g., Hackman & Lawler, 1971; McClelland & Burnham, 1976).

**Self-determination theory (SDT).** Developed in the late 1970s and formally introduced in the mid-1980s as a rigorous empirical-evidenced explanation for human behavior, self-determination theory (SDT) was initially applied in psychology but later expanded to other fields. SDT aids in identifying need fulfilment of individuals and suggests the psychological motivators behind their actions that encourage human potential toward growth, integration, and wellbeing. Research investigating SDT examines the interaction of these needs with environmental stimuli to understand the processes and conditions that nurture the success of activities in individuals, groups, and communities (Ryan & Deci, 2000a). Research incorporating SDT has also investigated suboptimal trajectories of growth, integration, and wellbeing to

understand ways in which environmental factors may indeed restrict or dilute these outcomes by reducing the fulfillment of human needs.

SDT specifies that the need for *autonomy*, *competence*, and *relatedness* are important for all individuals. The need for *autonomy* concerns an individual's urge to be a causal agent and achieve the perception that his/her activities are self-initiated and compatible with his/her own self-image (being able to exhibit a sense of free will in relation to acting on his/her own interests and values). *Competence* is considered to be fulfilled when an experience makes the individual feel he/she can generate desired effects and outcomes through control and mastery of his/her environment (we want to know how things will turn out as a result of our actions). Lastly, *relatedness* is fulfilled when an individual feels close and connected to significant others in his/her life (Reis et al., 2000). Therefore, self-determination theory focuses on the individual's ability to satisfy these needs within social environments (Gagné & Deci, 2005), with the view that he/she will be motivated to pursue and sustain activities which enable fulfillment of these three needs. Further, it has been suggested that if we identify the aspects of the social environment that lead to fulfillment of needs, and focus attention on enhancing and strengthening those elements, we can then increase motivation to pursue and maintain specific activities.

The activities that encourage engagement of individuals and the resulting increases in motivation and behavior vary by circumstance, environment, and culture, indicating the importance of specific design strategies that create environments conducive to positive development, performance, and wellbeing of individuals (Deci & Ryan, 1985, 1991; Ryan, 1995). Scholars consider self-determination theory to be applicable to a wide array of applications (Deci, 1980; Deci & Ryan, 1985, 1987, 1991), including leisure motivation. Further, self-determination theory is acknowledged by scholars as being important to the understanding

of motivation in sport and leisure across different populations including adults (Blais et al., 1990), and older adults (O'Connor & Vallerand, 1990; O'Connor et al., 1992; Vallerand & O'Connor, 1989, 1991).

The view that autonomy, competence, and relatedness may be universal does not imply that the fulfillment of these needs is unchanging across the life span or that their *relative* importance is the same across genders and cultures. Rather, the theory proposes that fulfillment of psychological needs is tied to environmental demands, impediments, and affordances in the specific sociocultural setting (Ryan & Deci, 2000a). Research has shown that an increased quality of life is experienced when older adults acknowledge and engage in activities that involve making their own decisions about their surroundings and experiences (autonomy); when they perceive of opportunities for self-control (competence); and when the activities they pursue, continue connections with friends and family (relatedness) (O'Rourke, et al., 2009). Kasser and Ryan (2001) found evidence of an increased wellbeing among older adults resulting from environments that primarily supported fulfillment of autonomy and relatedness, suggesting the need for additional research on which needs become more important as people age.

Research has shown that older adults often encounter feelings of reduced autonomy (Dacey & Newcomer, 2005). Adults change substantially as they become older and, coupled with diminishing physical ability, this threatens their independence and self-determination. This promotes the relevance of applying the concepts of self-determination theory to interventions that motivate older adults to participate in activities. Research conducted by Kunzmann, Little, and Smith (2002) involving older adults hypothesized different types of control - namely personal control over desirable outcomes, personal responsibility for undesirable outcomes, and others' control over desirable and undesirable outcomes - would each relate differently to

emotional wellbeing. Results showed that perceived control over desirable outcomes led to positive emotional wellbeing. Similarly, those who perceived others to be in control experienced a decline in positive emotional wellbeing. The results show a need to support autonomy in older adults.

Although research examining motivation specifically among older adults is rare, an exception is a study that focused on the environment and its impacts on motivation and psychological adjustment in nursing homes (Philippe & Vallerand, 2008). This research showed that a change in the individual's environment afforded an opportunity for psychological adjustment. How the individual adapted to the new environment was found to be dependent upon sequences of motivation that influenced fulfillment of autonomy needs. The results showed that participants living in nursing homes that provided an autonomous and self-directed environment experienced increased motivation, which determined the likelihood of successful adjustment by the individual to his/her new surroundings.

Based on this evidence, I hypothesize that autonomy needs may be particularly salient motivators for older adults, such that if open space access and use is believed to fulfill autonomy needs, this will motivate revisitation. Further, relatedness and competency needs are still important, but perhaps less so for motivating older adults. To address the importance of autonomy, I present the following hypothesis:

> ***Hypothesis 1*** *– Age influences the importance placed on autonomy, competence, and relatedness needs, with older adults placing more importance on autonomy, followed by competence and relatedness. Importance of needs may be a result of an interaction among demographic characteristics, including age, gender, and culture.*

**Attributes of Open Space which Result in Need Fulfillment.** Concern in recent times over the high proportion of society's sedentary lifestyle has promoted a focus on the provision, design, and use of outdoor open space. As previously reviewed, research has shown that elements such as comfort, convenience, safety, proximity and aesthetic appeal are relevant to the older adult's life enjoyment (Sugiyama et al., 2009) and that interactions among these and other features of open space stemming from gender-specific and culturally derived concerns may impact visitation. Yet, we do not fully understand why, nor do we have evidence as to which of these elements might be most important. Motivation theory, and in particular self-determination theory, is useful in helping to reconcile the underlying mechanisms, the "how" and "why" certain elements of open space motivate visitation, coinciding with Floyd et al.'s (2009) argument that the most salient environmental needs of the target population need to be identified and addressed in the provision and design of open space.

In particular, elements relating to the open space location in the broader community context and type of amenities present within the open space are critical for older adults in order to increase their motivation to visit open space, affecting both their perceptions of open space access and use. For the purpose of this study, location characteristics are not only defined by the park but also by its adjacent neighborhood, including its socio-demographic composition, safety, and access to transit. Amenity characteristics are defined as elements present in parks, such as seating, lighting, walking paths, facilities, vegetation, and views. Both location and amenity elements are critical to consider as the literature shows that access is not only experienced within the open space, but is also affected by factors external to the open space prior to visitation (Wright Wendel et al., 2012).

For example, considering access to the location of the park, fulfillment of autonomy needs would be achieved by an older adult's ability to get to the park using the local shuttle bus service without requiring the assistance of a friend or service provider to help him/her. Competence would be fulfilled by travelling to the park using his/her own private vehicle to afford a visit to the park, while relatedness would be fulfilled by travelling to the park with friends or family, either on public transit, on foot, or other means. An inability to fulfill needs relating to location would occur, if the older adult was simply unable to reach the park, because of the inability of service providers to get him/her to the park successfully.

In addition to simply getting to the park, elements of the park location, such as the composition of the adjacent community, either socially, culturally, or socio-economically, often impact whether individuals feel they have either physical (objective) or perceived (subjective) access to an open space location. In these circumstances, visiting a park that is located in an uncomfortable or unfamiliar environment is less likely to lead to revisitation. In this circumstance, autonomy needs will not be fulfilled as the ability of the older adult to move comfortably and securely to the open space will not be achieved. Competence will not be achieved, if an older adult does not feel secure in an unfamiliar environment. Finally, relatedness will not be achieved if the older adult experiences insecurity and is afraid of the people he/she may encounter. Further, convenient parking facilities have the potential to fulfill needs for autonomy, competence, and relatedness. For example, older adults who are still driving will fulfill their need for autonomy when they can decide when they wish to visit their local open space instead of adhering to the local transit timetable. The need for competence will be achieved when older adults can arrive at the open space location by themselves without the assistance of friends or relatives. Finally, relatedness needs will be fulfilled when older adults have the option

of taking friends or family with them to the open space location in their private vehicle because there is convenient parking available.

In addition to locational elements, park amenities provide many opportunities to fulfill needs, yet also frequently miss the mark, leading to feelings of exclusion in the individual. Amenities with a potential to fulfill all three needs for older adults may include elements of infrastructure, such as walking paths, shade, signage, seating, and restrooms. In addition, elements catering to exercise and activity may be considered by older adults in their decision to visit an open space, such as age-appropriate exercise equipment, sports fields, and multi-use paths. Further, amenities providing elements of the natural environment such as quality and quantity of vegetation, presence of wildlife and water, and opportunity for views are also highly valued by older adults (e.g. Sugiyama et al., 2009). For example, fulfillment of autonomy needs in an older adult could be achieved by having a choice of smooth paths on which to walk, all of which are able to be negotiated easily in getting the visitor along the desired path or to the desired destination. Competence may be fulfilled through legible maps that allow the older adult (and younger ones also) to find his/her own way through a park setting to the duck pond which, when visited, will also fulfill the needs for competence. Once the visit to the duck pond is finished, the individual may again use his/her choice of wide, flat paths (further fulfilling autonomy needs) to attend a game of park chess under the trees with long-time friends, all the while fulfilling the needs for relatedness.

Clearly, understanding the extent to which these open space elements fulfill needs is an important means by which to provide direction in planning and designing open spaces. For older adults, investigation of this is particularly critical, because if autonomy is more salient, and if as proposed earlier, autonomy needs are met by particular elements of open space, then these

elements must be included in park provision and design. For example, a wide path that is designed with an even surface and limited undulations or changes in gradient will afford the older adult the ability to choose this path or another similar path without being excluded from its use by difficulties in navigating its course.

Yet there has been no research to date which investigates these phenomena. With this objective in mind, and to explore these relationships among elements of open space and the fulfillment of needs, I hypothesize the following:

> ***Hypothesis 2*** *- Favorable evaluation of open space location and amenities is related to fulfillment of autonomy, competence and relatedness needs.*

**Relationship of Need Fulfillment to Revisitation.** It is not just the motivation initially experienced by an individual upon first engaging in an activity, but also his/her experiences that ensue when he/she participates in activities that fulfill needs and propel future behavior (Ryan & Deci, 2000b). Research concludes that an understanding of the impacts of self-determination theory and motivation is not restricted to an evaluation of the positive influences. Equally important is the need to comprehend the psychological processes and outcomes of need deprivation on wellbeing. Thus, scholarly research must begin to target the interactions of psychological needs and interventions (Ryan & Deci, 2000a). In other words, we need to understand not just whether one is motivated to access and use open space, but also what transpires when he/she visits open space. To what extent are needs fulfilled by the visitation? What specific elements of the open space lead to need fulfillment? Are these elements different between older and younger patrons? Men versus women? Among different cultures? When needs are fulfilled, visitors are likely to return to the open space. If we consider an example of

appropriate programming at a park, such as birdwatching from the deck of the Audubon Center with other bird-loving older adults, we can see how this program caters to various ages, genders, and diverse cultures. This opportunity will likely lead to repeat visitation for bird-loving individuals. Autonomy is likely fulfilled through the safety and comfort concerns of participants being appropriately catered to; competence is likely fulfilled through opportunities for exploration and adventure through contact with nature; and relatedness is likely fulfilled by sharing the experience with others who have similar interests. In summary, I hypothesize the following:

> ***Hypothesis 3*** *– Fulfillment of psychological needs during open space visitation will be related to the likelihood of revisiting the open space in the future. In particular, among older adults, the strongest relationship will occur between autonomy need fulfillment and revisitation.*

Much of the open space literature has assumed that planning decisions and design elements will directly impact whether or not people will come to the park. Some studies indicate that attractive spaces and provision of other community amenities are simply 'good for us', without fully explaining *why* this is the case (Takano et al., 2002). For example, Takano et al. (2002) suggest that provision of walkable paths and vegetated public areas will provide health benefits for older adults. However, they do not explain why these elements provide health benefits, and why they might result in the older adult returning to the open space. Is simply viewing these elements from a distance enough? If an individual is physically impaired, unmotivated, or unable to afford the cost of travelling to or entering a park or other walkable open space, these provisions will be unlikely to result in revisitation and will then have no

bearing on health outcomes. Thus, what has yet to be investigated are the underlying mechanisms by which the relationship between elements of open space and revisitation occurs. It seems highly simplistic to assume that simply putting a park or open space in a certain location is going to guarantee visitation and revisitation. A key objective of this dissertation has been to dispel the "build-it-and-they-will-come" mentality by adding richness to our understanding of 'why' and 'how' elements of open space result in access, use, and revisitation.

Here, I propose that the need for autonomy, competence, and relatedness during a park visit are key mediators that impact open space revisitation. Stated another way, elements of open space are related to need fulfillment, which in turn is related to open space revisitation. That said, fulfillment of these three needs (autonomy, competence, and relatedness) may not be the *only* mechanism by which elements of open space influence revisitation. For example, there may be other needs, values, or priorities that influence revisitation. Statistically, this implies what is referred to as "partial mediation," defined as the case where the relation between the independent and the dependent variables is not completely accounted for by the mediator (MacKinnon, 2008). By suggesting that need fulfillment partially mediates the relationship between elements of open space and revisitation, I am arguing that need fulfillment is an important mechanism that must be understood, but potentially sits alongside other mechanisms. This leads to the following hypothesis.

> ***Hypothesis 4*** *– The relationship between open space location and amenities and the likelihood of revisitation will be partially mediated by fulfillment of needs for autonomy, competence, and relatedness during a previous visit. For older adults, the strongest relationships will occur when needs for autonomy are fulfilled.*

Although it was proposed previously that there is a positive relationship between autonomy need fulfillment and revisitation, it may be that this relationship changes based on how important the need in question is to the individual. Prior research has shown that need importance varies based on many different criteria (Ryan & Deci, 2000a). This suggests the possibility that moderators exist in the relationship between need fulfillment and revisitation. A moderator changes the nature and strength of the relationship between one concept and the other (Baron & Kenny 1986). Moderators may represent boundary conditions as to when a relationship will be strong or weak, positive or negative. It is likely that revisitation will be particularly influenced by need fulfillment, when the need is more important to the individual. Therefore need importance is proposed as a moderator of the relationship between need fulfillment and revisitation, generating the following proposition:

> ***Hypothesis 5*** *- The relationship between need fulfillment and revisitation is stronger, the more important the need to the individual (i.e., need importance moderates the relationship between need fulfillment and revisitation).*

Investigating these propositions will result in greater precision in theory and practice. It is thus anticipated that the study described next will enable development of more effective provision, design, and implementation of open space, and better fulfill the needs of older adults and varying subgroups of the older adult population. Open space program managers will find benefit from research conducted through a motivational lens in facilitating older adults to attend parks. Health professionals and nursing staff may find relevance in understanding origins of motivation among older adults for attending parks. The end result will guide appropriate amenity

design and provision to cater to the specific preferences required by this diverse group, improving quality of life in our older years.

# CHAPTER 4: METHODOLOGY

Given the complexity of psychological needs about parks and the general lack of research regarding the physical and programmatic elements to satisfy these needs, this study utilizes a mixed-methods empirical approach combining qualitative and quantitative data collection and analysis to illuminate them (Johnson et al. 2007). The qualitative analysis has the potential to provide insights to guide theory development and formulate hypotheses for subsequent quantitative analysis, but it is also highly valuable in interpreting quantitative results and understanding their implications for practice (Creswell & Plano Clark, 2011). Using this combined approach, I explore perceptions of open space access as driven by the respondent's psychological needs. The study also compares the perceptions of accessibility among younger versus older adults, and between male and female study participants, and determines differences in these responses across countries of origin of park visitors who reside in Australia (See Figure 2 below for survey intent). Specifically, I combine the breadth afforded by large-scale survey data collection, with the depth afforded by interviews, to better understand open space access and visitation[2].

## Preliminary Interviews

I conducted initial interviews with 10 interviewees to provide the grounding for survey development. Of particular interest in this phase was the derivation of common themes among older adults aged 65 and over in relation to open space access and use. Data from preliminary interviews identified potential opportunities for the primary interview data collection to fill some

[2] UCLA Institutional Review Board approval was granted prior to commencement of interview and survey data collection.

gaps created by deficiencies in literature and research (as previously noted), and established more in-depth knowledge of the phenomenon and the social group involved. Preliminary interviews were also used to identify potential logistical issues relating to the surveys.[3]

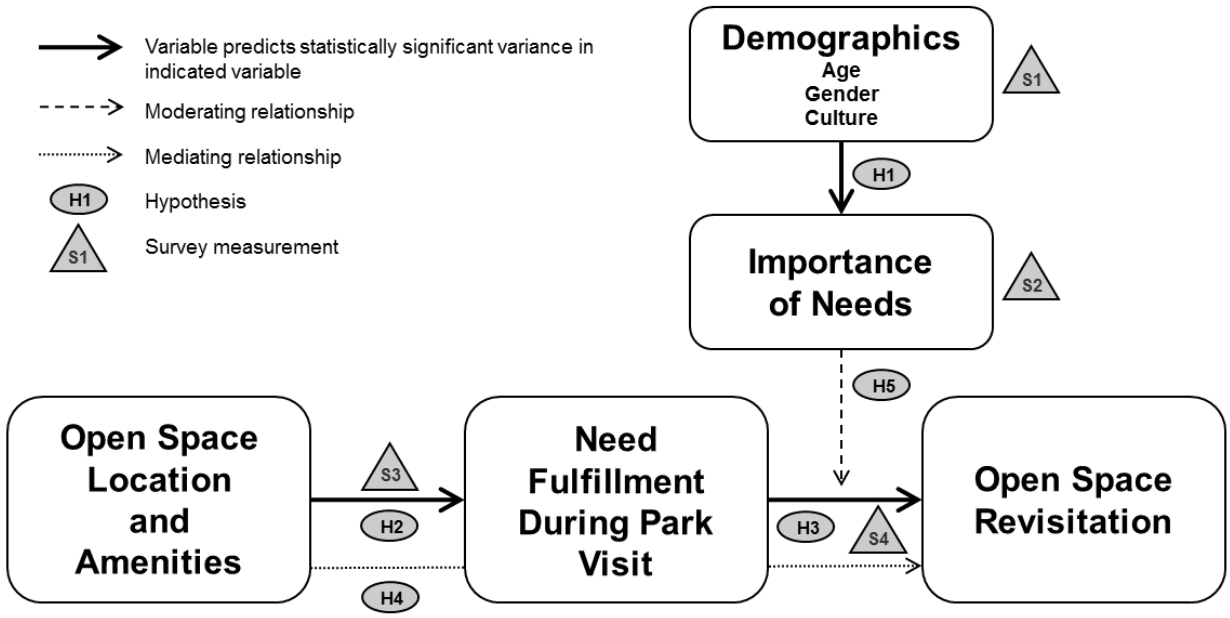



***Figure 2:*** *The Open Space "Motivation to Access" Process Model – Survey Intent*

Interviewees were typically volunteers accessed through existing connections with retirement villages in the Perth metropolitan area. A retirement village provides accommodation or other amenities and services to persons aged 55 and over. They are typically covered under the Australian Retirement Villages Act 1992 and incorporate some form of tenancy agreement or ownership of either shares in the village or of the residential unit. Management of the village is

[3] Care was taken throughout the project to ensure the research adhered to ethical protocols set out by the University of California – Los Angeles (UCLA) Institutional Review Board (IRB) to ensure participants were safeguarded to the best of the researcher's ability. Participants were provided with a study information sheet prior to participating in the interview that made them aware that participation in the study was completely voluntary and requested their consent prior to commencement. The sheet provided information about the project and contact details for the researchers in case there were queries or doubts. Participants acknowledged that they had read and agreed to all of the conditions and consented to their data being used and were made aware that they were free to withdraw from the study at any time without reason or prejudice; allowing for autonomy. All data that were collected have remained the property of the researcher, Stephen Gibson. All interview files, metadata, and transcripts have been securely stored on a password protected hard drive since collection.

typically undertaken by a resident manager and associated staff in the role of Executive Administration; paid staff dedicated to maintenance, provision of recreational services, and responsibility for compliance and administrative duties involved in the overseeing of the village. In these circumstances, I obtained permission from the Executive Administration office of each retirement village prior to contacting residents. I provided information to the Executive Administration office of each village, which then distributed the information via posting on notice boards, sending of emails, and inclusions in weekly or monthly newsletters at the retirement village. Residents either signed up for a specific time or visited a specified location at a specific time to participate in an interview. In total, the preliminary interview sample contained 6 males and 4 females and was diverse in terms of cultural background. The respondents' age ranged from 65 to 89. Interviewees were also from various locations with 4 coming from urban and 6 from rural locales.

Interviews were conducted individually, and on average were approximately 45 minutes in length, ranging from 22 minutes to 58 minutes. They were held on site at the person's place of residence, and were tape recorded and transcribed verbatim, resulting in 143 pages of text data. The interviews explored the following themes (See Appendix A for interview protocol):

***I-1.*** *Aspects of open space experiences of older adults that influence their perceptions of appropriateness of location, amenities, and programs, fulfill their needs, and encourage them to engage in repeat visitation to the park.*

***I-2.*** *Motivations experienced by the individual in his/her intent to revisit the open space location, the perceived influences encouraging motivation to revisit, and the perception of fulfilment of needs resulting from a repeat visit.*

***I-3.*** *In cases of lack of desire to revisit (or refusal for initial attendance) open space locations, responses informing what interviewees believe can be done to*

*change their visitation patterns, and ways in which open space provision, design, and programs can be revised to increase their motivation to visit open space again.*

**Preliminary Interview Findings.** These preliminary interviews indicated the need for many important refinements in the research design and development of measurement metrics. For example, across the entire sample, respondents indicated that the most important cultural distinction in this context is that between Australian-born and foreign-born interviewees. This contrasts two distinct cultural groups within Australia. That is, Australian-born respondents are likely to share norms, values, beliefs and experiences that are distinct from foreign-born respondents, as per the conceptualizations of culture presented in the literature (e.g., Erez and Earley, 1995). The basis for these cultural group distinctions may coincide with race or ethnicity (e.g., Australian-born respondents are likely to be white), but are not entirely synonymous with the cultural groups formed based on these other demographic characteristics (e.g., there are subgroups of Australian-born people that are not white). Yet, given individuals in these groups do likely share norms, values, beliefs, and experiences it is likely that much of the literature discussed previously which demonstrated racial or ethnic differences pertaining to open space is also applicable to cultural groups of Australian-born or foreign-born status. Therefore, it was this distinction that was included in the demographic section of the survey described below to capture potential cultural differences. Australian census data confirmed that this is the distinction that is most relevant in this context (i.e., neither ethnicity nor race are included on Australian Census forms, hence are not deemed as salient in this context).

A second important finding was that programming is incredibly rare in open spaces in Australia as compared with, for example, the United States. Therefore, a decision was made to focus on the aspects of open space which were discussed by all respondents in the preliminary interviews: location and amenities. Specifically, respondents described three elements of location: convenience (e.g. proximity of the park to residences or ease of getting to the park via various transportation modes), safety (e.g. safety of various routes of travel to the open space location or whether the park was in full view or secluded), and community (e.g. presence of other users of similar social class and/or stage of life). Likewise three elements of amenities were repeatedly mentioned; infrastructure (e.g. parking, clear signage, or restroom facilities), exercise (e.g. walking paths, exercise equipment, or other sporting facilities), and natural environment (e.g. quality vegetation, views, presence of wildlife). Hence scale development was concentrated around these specific elements. Additional insights included suggestions for the specific wording of survey items and the ways in which respondents expressed intention and feelings toward open space revisitation. For example, when asked whether they would visit a specific park again, many respondents replied in terms of likelihood (i.e., "It's likely I'll return").

## Surveys

**Survey Methodology.** I employed survey-based data collection to allow for testing of hypotheses investigating older adults' perceptions of open space and 1) the relative importance of the need for autonomy, competence, and relatedness across demographic groups; 2) experiences during visitation to a specific open space location, including need fulfilment and experience of location and amenities; and 3) levels of intent for repeat visitation.

***Survey Sample and Data Collection.*** Both an initial pilot survey (consisting of 43 survey responses), and the final survey sampling (which yielded over 1000 valid survey responses) were conducted using an internet-based panel data collection platform.[4] The selected online panel data company confirmed their ability to achieve the required proportional spread across age, gender, country of origin, and socio-economic divisions that would be representative of the Australian population and thereby reduce population bias. The company recruits respondents offline to reduce bias toward urban individuals, heavy online users, those with online connectivity versus those without, and overrepresentation of the younger generation. In addition, the company has access to over 450,000 "members" who are representative of a spread of demographics in close accordance with the most recent Australian Bureau of Statistics (ABS) data. The company confirmed that their "panel recruitment policy" utilizes offline sources for recruitment as this reduces the occurrence of over representation of residents in urban areas, residents who are heavy online users and residents who are representative of the younger age groups.

The parameters for inclusion in surveys include adults (aged 18 and above), both male and female, representing a range of backgrounds. The sample contains approximately 500 respondents under the age of 65 years and 500 respondents aged 65 and over. Within each stratum of 500 respondents, there are approximately 250 males and 250 females, representing the approximate division of males and females according to 2012 ABS data. Respondents younger

[4] As with the interview procedures, during the survey, precautions were taken throughout the data collection to ensure the research adhered to ethical protocols set out by the UCLA Institutional Review Board (IRB) and ensure participants were protected to the full capability of the researcher. Participants were made aware that participation in the study was completely voluntary through a digital participant information form requiring consent prior to commencing the survey. The digital participation form provided information about the project, how the results would be used, and provided contact details for the researcher in case there were questions or concerns. Participants acknowledged that they had read and agreed to all of the conditions and consented to their data being used and were made aware that they were free to withdraw from the study at any time without reason or prejudice; allowing for autonomy. Confidentiality measures were also taken to de-identify participants ensuring those handling the data were unable to identify respondents. All data that were collected have remained the property of the researcher and have been securely stored on a password protected hard drive, as is required by UCLA IRB protocols.

than 65 were used for comparison purposes to confirm unique perceptions, motivations, and concerns of older adults aged 65 and over. The project administrators indicated that response parameters are being adjusted for each project to ensure that social groups are represented in the appropriate proportions as per current data released by the Australian Bureau of Statistics (ABS).

Stratified sampling techniques were applied to ensure appropriate representation of demographic subsets of the general population to reduce sampling bias (Babbie, 2013; Shaddish, Cook, & Campbell, 2002). The parameters for inclusion in both the pilot and final survey sample included adults (aged 18 and above), both male and female, representing a range of Australian-born and foreign-born individuals. The final sample contained approximately 50% of respondents under the age of 65 years and approximately 50% of respondents aged 65 and over. Within each age stratum of approximately 500 respondents, there were 50% males and 50% females, representing the approximate division of males and females according to 2011 Australian census data. Within each of the respective male and female stratum, representation of Australian-born and foreign-born individuals was again achieved according to census statistics in Australia (See Tables 1 and 2, page 63). Respondents below the age of 65 were used for comparison purposes to confirm unique perceptions, motivations, and concerns of older adults (65 and over). Sample survey questions are provided in Appendix C for reference. Analysis of survey data employed SPSS v23 (Statistical Package for the Social Sciences) software.

***Pilot Analysis.*** Preliminary analyses of reliability and validity of all scales were conducted on the initial pilot sample. Specifically, exploratory factor analyses and iterative reliability analyses were conducted (i.e., computation of Cronbach's Alpha on scales as originally composed, as well as reliability of each scale after removing items with low to item-to-total correlations). This led to numerous refinements on scale content and item wording before

the final survey administration. Respondent completion time and qualitative descriptions of open space were also examined to determine if, generally, speaking, the survey administration as planned was feasible. The resulting administration procedure was deemed effective.

***Final Sampling.*** To test the hypotheses, the survey was administered to a sample of 1043 individuals using the internet-based panel data collection platform previously described, as well as the stratified sampling technique above. The overall sample mirrored census statistics for the Australian population[5], incorporating appropriate percentage representation for under 65 men, under 65 women, 65 and over men, and 65 and over women. Further, the sample replicated the approximate spread across the population for country of origin as a key focal dimension.

***Data Screening Methods.*** I screened and tested for missing data, and confirmed that all responses were complete with no missing data. Of the 1043 responses, 5 were found to provide a uniformity of answers across all questions (for example, a response of 1 on every 5-point Likert scale-based question, regardless of forward or reverse coding). These 5 responses (constituting 0.47%) were removed, leaving a total of 1038 valid survey responses. The 1038 survey responses (totals by category) are indicated in Tables 1 and 2 below.

***Overview of Process for Scale Development.*** Items that had been generated during the process of preliminary interviews and pilot surveys were subjected to a set of additional analyses to ensure adequate reliability and factor structure. All items intended to measure a given concept (e.g. the eight items intended to capture the convenience of a location) were subjected to reliability analysis and Principal Component analysis. Items were removed if analyses indicated

[5] The panel-based data collection administrators confirmed that the number of aboriginal Australians on panels is minimal (about 1%) and this percentage was deemed to be too small to be able to report any significant findings in this study. As noted later in this paper, a study focusing on indigenous people will be conducted at a later stage.

that the scale would improve in internal coherence and constancy by doing so. This iterative process continued until all items loaded on a single factor with Eigenvalue greater than 1, item loadings greater than 0.50, and reliability (Cronbach's Alpha) above 0.70 (Pedhazer & Schmelkin, 2013). When a viable set of items had been determined, scale score was computed for each individual respondent for each variable in the hypotheses using the arithmetic mean of the items. The mean was utilized based on the perspective that all items contributed equally to understanding a core construct (key variable) and therefore the mean across items represents the respondent's central tendency with regard to that particular construct (Pedhazur & Schmelkin, 2013). Results of these analyses are presented below.

| **Criteria** | | **Australian Census Data – 2011** | **Project Data** | |
|---|---|---|---|---|
| Population (2011 Census) | | 100% | 1038 | 100% |
| Gender | Male persons | 49.4% | 529 | 50.96% |
| | Female persons | 50.6% | 509 | 49.04% |
| Country of Origin | Australian Born Residents | ~70% | 677 | 65.22% |
| | Foreign Born Residents | ~30% | 361 | 34.78% |

***Table 1:*** *Holecount Figures for Overall (Cleaned) Data Collection Compared to Census Statistics.*

| **Under 65 n=513** | | | | **65 and Over n=525** | | | |
|---|---|---|---|---|---|---|---|
| Male n=241 | | Female n=272 | | Male n=288 | | Female n=237 | |
| Australian-born | Foreign-born | Australian-born | Foreign-born | Australian-born | Foreign-born | Australian-born | Foreign-born |
| 161 | 80 | 178 | 94 | 192 | 96 | 146 | 91 |

***Table 2:*** *Final Demographics (cleaned data sample) – Under 65 and 65 and Over Data.*

**Scale Development - Needs Scales.** The scales measuring need importance and need fulfilment have been utilized extensively in prior studies and validated based on the theoretical framework suggesting separate scales for importance and fulfilment of the three needs (for a review, see Deci & Ryan, 2000); however, I conducted analyses to verify the scale structure and reliability within the current sample. Respondents answered items regarding the importance and fulfilment of their needs using the following response scale: 1=Not at all Important, 2=A Little Important, 3=Moderately Important, 4=Quite Important, and 5=Very Important.

***Need Importance – Autonomy.*** To examine the factor structure of the items pertaining to the importance of the need for autonomy, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 2.399 that explained 59.96% of the variation in the data and an inspection of the scree plot supported this solution. Further, all of the items loaded strongly onto this factor with Cronbach's Alpha reporting as 0.77 (See Table 3 below). As a result, the score for Autonomy Need Importance for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What is important in your life? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| Being able to decide for myself how to live my life. | 0.603 |
| Completing something in my own way. | 0.640 |
| Doing activities that I want to do. | 0.650 |
| Being free from pressure to do things others want me to do. | 0.506 |
| Eigenvalue | 2.399 |

***Table 3:*** *Autonomy Need Importance Scale*

***Need Importance – Competence.*** To examine the factor structure of the items pertaining to the importance of the need for competence, I again conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 2.826 that explained 70.65% of the variation in the data and an inspection of the scree plot again supported this solution. All of the items loaded strongly onto this factor, with Cronbach's Alpha reporting as 0.86. (See Table 4 below). As a result, the score for Competence Need Importance for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What is important in your life? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| Feeling competent at the things I do. | 0.755 |
| Succeeding with activities that are difficult. | 0.880 |
| Mastering any challenges. | 0.864 |
| Doing well even at the hard activities. | 0.857 |
| Eigenvalue | 2.826 |

***Table 4:*** *Competence Need Importance Scale*

***Need Importance – Relatedness.*** Finally, to examine the factor structure of the items pertaining to the importance of the need for relatedness, I again conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 3.291 that explained 82.29% of the variation in the data and an inspection of the scree plot again supported this solution. All of the items loaded strongly onto this factor, and Cronbach's Alpha was 0.93 (See

Table 5 below). As a result, the score for Relatedness Need Importance for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What is important in your life? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| A sense of contact with other people. | 0.908 |
| Feeling close with other people in general. | 0.914 |
| Being connected with other people in general. | 0.915 |
| Experiencing a sense of belonging with other people. | 0.891 |
| Eigenvalue | 3.291 |

***Table 5:*** *Relatedness Need Importance Scale*

***Need Fulfilment – Autonomy.*** To examine the factor structure of the items pertaining to the fulfilment of the need for autonomy, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 2.619 that explained 65.48% of the variation in the data and an inspection of the scree plot supported this solution. Further, all of the items loaded strongly onto this factor, and Cronbach's Alpha was 0.82 (See Table 6 below). As a result, the score for Autonomy Need Fulfilment for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you on this occasion.**<br>**Visiting the park allowed me to...** | |
| ...decide for myself how to spend my time. | 0.769 |
| …be free from pressure to do things others want me to do. | 0.747 |
| ...do things in my own way. | 0.894 |
| ...be myself in a regular setting. | 0.819 |
| Eigenvalue | 2.619 |

***Table 6:*** *Autonomy Need Fulfilment Scale*

***Need Fulfilment – Competence.*** To examine the factor structure of the items pertaining to the fulfilment of the need for competence, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 3.269 that explained 81.72% of the variation in the data and an inspection of the scree plot again supported this solution. All of the items loaded strongly onto this factor, and Cronbach's Alpha was 0.925 (See Table 7 below). As a result, the score for Competence Need Fulfilment for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you on this occasion.**<br>**Visiting the park allowed me to...** | |
| ...succeed with park activities that I find difficult or challenging. | 0.947 |
| ...do well, even at the hard activities. | 0.944 |
| ...master any challenges. | 0.889 |
| ...feel competent at the park activities I do. | 0.831 |
| Eigenvalue | 3.269 |

***Table 7:*** *Competence Need Fulfilment Scale*

***Need Fulfilment – Relatedness.*** Finally, to examine the factor structure of the items pertaining to the fulfilment of the need for relatedness, I again conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 3.577 that explained 89.42% of the variation in the data and an inspection of the scree plot again supported this solution. All of the items loaded strongly onto this factor, and Cronbach's Alpha was 0.96 (See Table 8 below). As a result, the score for Relatedness Need Fulfilment for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you on this occasion.**<br>**Visiting the park allowed me to...** | |
| ...experience a sense of contact with other people. | 0.965 |
| ...feel close with other people in general. | 0.954 |
| ...be connected with other people in general. | 0.941 |
| ...experience a sense of belonging with other people. | 0.922 |
| Eigenvalue | 3.577 |

***Table 8:*** *Relatedness Need Fulfilment Scale*

**Scale Development – Importance of Elements of Open Space Scales.** The scales developed to capture importance of open space elements are new to the literature and developed here specifically for the purpose of examining particular elements of open space location and particular elements of open space amenities, as revealed in the preliminary interviews. As a result, I examined each of the proposed new subscales independently to determine if factor structure and reliability could be obtained in the sample.

Respondents were asked to reflect on a recent visit to a park or open space. An open-ended item requested that they type in the specific name of the park or open space visited. A range and variety of responses were provided, for example Fitzroy Gardens (Melbourne, Victoria), Queens Park (Ipswich, Queensland), Royal National Park (response indicating this location as the world's oldest National Park, near Sydney, New South Wales), Gold Coast Botanical Gardens (Queensland), and South Perth Foreshore (Western Australia).

Next, respondents indicated the extent to which particular elements of park and open space location were important during the visit and contributed to their satisfaction with their visit. In addition, similar questions were asked in relation to certain elements of park and open space amenities. They utilized the following scale to respond, where 1=Not at all Important, 2=A Little Important, 3=Moderately Important, 4=Quite Important, and 5=Very Important.

***Elements of Open Space Location – Convenience.*** To examine the factor structure of the items pertaining to elements of open space relating to the convenience of the location, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 3.004 that explained 60.08% of the variation in the data and an inspection of the scree plot supported this solution. Further, all five of the items loaded strongly onto this factor, and Cronbach's Alpha was 0.82 (See Table 9 below). As a result, the score for Open Space Location Elements (Convenience) for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| The park location was close to my home. | 0.668 |
| The park location was close to public transport. | 0.630 |
| The park was accessible to me on foot. | 0.822 |
| The park was relatively flat and not hilly. | 0.811 |
| The park was in full public view, not visually secluded. | 0.909 |
| Eigenvalue | 3.004 |

***Table 9:*** *Open Space Location Elements (Convenience) Scale*

***Elements of Open Space Location – Safety.*** To examine the factor structure of the items pertaining to elements of open space relating to the safety of the location, I again conducted a principal component analysis. Items loaded on a single factor having an Eigenvalue of 1.729 that explained 86.44% of the variation in the data and an inspection of the scree plot again supported this solution. Further, all three items loaded strongly onto this factor, and Cronbach's Alpha was 0.84 (See Table 10 below). As a result, the score for Open Space Location Elements (Safety) for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| The park was in a safe neighbourhood. | 0.930 |
| The park was safe. | 0.930 |
| Eigenvalue | 1.729 |

***Table 10:*** *Open Space Location Elements (Safety) Scale*

***Elements of Open Space Location – Community.*** To examine the factor structure of the items pertaining to elements of open space relating to the community feel of the location, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 1.611 that explained 80.53% of the variation in the data and an inspection of the scree plot again supported this solution. Further, both items loaded strongly onto this factor, and Cronbach's Alpha was 0.76 (See Table 11 below). As a result, the score for Open Space

Location Elements (Community) for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| The surrounding community was of a similar race or ethnicity to mine. | 0.897 |
| The surrounding community was of a similar social class to mine. | 0.897 |
| Eigenvalue | 1.611 |

***Table 11:*** *Open Space Location Elements (Community) Scale*

***Elements of Open Space Amenity – Infrastructure.*** To examine the factor structure of the items pertaining to infrastructural elements of the park's amenities, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 2.947 that explained 58.94% of the variation in the data and an inspection of the scree plot supported this solution. Further, all items loaded strongly onto this factor, and Cronbach's Alpha was 0.82 (See Table 12 below). As a result, the score for Open Space Amenities (Infrastructure) for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| The park had easy-to-read signage. | 0.672 |
| There was shade at the park. | 0.839 |
| The park had comfortable seating. | 0.842 |
| There were clean toilets / restrooms at the park. | 0.713 |
| There was convenient parking available at the park. | 0.758 |
| Eigenvalue | 2.947 |

***Table 12:*** *Open Space Amenities (Infrastructure) Scale*

***Elements of Open Space Amenity – Exercise.*** To examine the factor structure of the items pertaining to exercise elements of the park's amenities, I yet again conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 1.569 that explained 78.45% of the variation in the data and an inspection of the scree plot yet again supported this solution. Further, all items loaded strongly onto this factor, and Cronbach's Alpha was 0.73 (See Table 13 below). As a result, the score for Open Space Amenities (Exercise) for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| The park had exercise equipment. | 0.886 |
| There were sports ovals at the park. | 0.886 |
| Eigenvalue | 1.569 |

***Table 13:*** *Open Space Amenities (Exercise) Scale*

***Elements of Open Space Amenity – Natural Environment.*** Finally, to examine the factor structure of the items pertaining to the park's amenity elements of the natural environment, I yet again conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 2.711 that explained 54.22% of the variation in the data and an inspection of the scree plot once again supported this solution. Further, all items loaded strongly onto this factor, and Cronbach's Alpha was 0.78 (See Table 14 below). As a result, the score for Open Space Amenities (Natural Environment) for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| There were nice views at the park. | 0.794 |
| The park had water features, such as lakes, streams, or fountains. | 0.698 |
| There were good quality trees, shrubs, and other vegetation at the park. | 0.598 |
| There was wildlife at the park. | 0.769 |
| There were gardens and flowers at the park. | 0.803 |
| Eigenvalue | 2.711 |

***Table 14:*** *Open Space Amenities (Natural Environment) Scale*

**Revisitation.** The concept of revisitation was introduced by asking the survey respondent a single question: "Overall, what is the likelihood that you will visit this park again?" The descriptive statistics for the under 65 yielded a mean = 4.40 and s.d. = 1.019; for the over 65 data set a mean = 4.48 and s.d. = 1.037 (See Tables 15 and 16 below).

**Open-ended items.** A series of additional open-ended questions asked respondents to indicate any additional aspects of the park or open space that were important to their visit. Again, a range and variety of responses were obtained; however, many of these were simply variants of the above themes (i.e., they pertained to convenience, safety, and community elements of the location and/or infrastructure, exercise, and natural environment). For example, "It is across the road and allows me into green space" and "Easy public transport access" (convenience), "It makes me feel free" (safety), "a chance to meet other people with similar interests (community), "I walk most days for fitness" (exercise), and "I go to the parks just to relax and be in nature"

(natural environment). This corroborated the preliminary interviews which had indicated that these are the most pertinent elements of park and open space experience in this context.

***Data screening before hypothesis testing.*** A Kolmogorov-Smirnov test was used to determine if the responses for each construct were normally distributed. In each case, the analysis suggested normality. Field (2009) recommends a visual inspection of graphs when the sample is large, as skewness and kurtosis are very sensitive in such cases. The visual inspection confirmed normality.

***Common method bias.*** Common method bias is the amount of false covariance shared between constructs due to the common method of data collection (Malhotra et al., 2007). In this study, all survey data was collected via self-reporting methodology, a common method of quantitative measurement among social science researchers (Taras, Rowney & Steel 2009), but which can potentially lead to an increase in the strength of relationships between predictors and criteria due to a single source of data, known as common method variance (Podsakoff et al. 2003).

To examine whether this was the case, variance inflation factors (VIFs) were computed for all constructs in the model using SPSS. Typically, if all VIFs are less than 5.0, common method bias is unlikely a problem. Here, VIF scores ranged from 1.589 (Relatedness Importance) to 3.381 (Location Importance – Safety), suggesting that common method bias was not a problem in the context of this study, and that the model can be safely estimated.

***Correlations among scales.*** Tables 15 and 16 provide the descriptive statistics and correlations for all constructs used in initial tests of hypotheses. These tables include the originally comprised subscales for the six elements of open space (i.e., three subscales relating to

location and three subscales relating to amenity). As can be seen in the Tables, the means were around the midpoint for items using a 5-point Likert Scale, with the exception of the likelihood of revisitation variable, which was positively skewed. Further, the standard deviations suggested there was reasonable variability, and that further analysis was likely to be worthwhile.

Further, the three separate location elements (row/column 11, 12, & 13) were positively correlated with one another, and the three separate amenity elements (row/column 14, 15, & 16) were positively correlated with one another (see Tables 15 and 16 below), which would be expected given they collectively link into an overall experience of the location of space or amenities of space. In addition, the three elements pertaining to location were more highly correlated with each other than with the amenities elements. Likewise, the three elements pertaining to amenities were more highly correlated with each other than with location elements.

Examining correlations between location subscales and amenities subscales, the values were within acceptable limits according to some thresholds, yet exceeded other thresholds. Specifically, the literature on correlation coefficients suggests that there is a range of acceptable coefficients. For example, Evans (1996) suggests correlation coefficients of 0.2-0.39 to be weak, 0.4-0.59 to be moderate, and 0.6-0.79 to be strong. Others have suggested correlations above .90 are of concern in determining degree of collinearity (Green et al., 1988).

| Variables | Mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Likelihood of Revisitation | 4.400 | 1.019 | | | | | | | | | | | | | | | | |
| 2. Male or Female (1=M, 2=F) | 1.490 | 0.500 | .001 | | | | | | | | | | | | | | | |
| 3. Age (1=Under 65, 2= Over 65) | 1.510 | 0.500 | .072* | -.079* | | | | | | | | | | | | | | |
| 4. Country of Origin (0=Foreign-born, 1=Australian-born) | 0.653 | 0.476 | .040 | -.030 | -.020 | | | | | | | | | | | | | |
| 5. Autonomy Importance | 4.131 | 0.614 | .229** | .104** | .065* | -.026 | | | | | | | | | | | | |
| 6. Autonomy Fulfilment | 3.017 | 1.101 | .357** | .083** | -.044 | -.024 | .331** | | | | | | | | | | | |
| 7. Competence Importance | 3.862 | 0.702 | .226** | .022 | .027 | -.001 | .581** | .241** | | | | | | | | | | |
| 8. Competence Fulfilment | 2.164 | 1.110 | .183** | -.013 | .137** | -.015 | .176** | .593** | .298** | | | | | | | | | |
| 9. Relatedness Importance | 3.677 | 0.856 | .218** | .187** | .006 | .001 | .426** | .245** | .488** | .221** | | | | | | | | |
| 10. Relatedness Fulfilment | 2.354 | 1.174 | .176** | .084** | -.144** | -.059 | .157** | .441** | .208** | .566** | .436** | | | | | | | |
| 11. Location Importance – Convenience | 2.895 | 0.901 | .238** | .154** | -.123** | -.060 | .243** | .388** | .226** | .408** | .309** | .447** | | | | | | |
| 12. Location Importance - Safety | 3.275 | 1.007 | .292** | .247** | -.099* | -.027 | .303** | .384** | .218** | .309** | .331** | .423** | .757** | | | | | |
| 13. Location Importance - Community | 2.597 | 1.012 | .166** | .139** | -.178** | -.030 | .183** | .380** | .203** | .458** | .305** | .527** | .747** | .751** | | | | |
| 14. Amenity Importance - Infrastructure | 3.291 | 1.038 | .229** | .184** | -.089** | -.037 | .270** | .325** | .238** | .293** | .335** | .399** | .646** | .642** | .574** | | | |
| 15. Amenity Importance - Exercise | 2.509 | 0.977 | .142** | .119** | -.217** | -.058 | .149** | .320** | .202** | .433** | .326** | .463** | .682** | .624** | .692** | .685** | | |
| 16. Amenity Importance - Natural Environment | 3.125 | 1.019 | .288** | .138** | -.138** | -.058 | .242** | .395** | .227** | .344** | .293** | .330** | .461** | .446** | .474** | .637** | .537** | |

*p ≤ 0.05 **p ≤ 0.01

***Table 15:*** *Descriptive Statistics and Correlations – Total Sample (Under 65 and 65 and Over)*

| Variables | Mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Likelihood of Revisitation | 4.480 | 1.037 | | | | | | | | | | | | | | | |
| 2. Male or Female (1=M, 2=F) | 1.450 | 0.498 | -.092* | | | | | | | | | | | | | | |
| 3. Country of Origin (0=Foreign-born, 1=Australian-born) | .644 | 0.479 | .039 | -.053 | | | | | | | | | | | | | |
| 4. Autonomy Importance | 4.171 | 0.566 | .413** | .169** | -.044 | | | | | | | | | | | | |
| 5. Autonomy Fulfilment | 2.970 | 1.128 | .401** | .051 | -.019 | .299** | | | | | | | | | | | |
| 6. Competence Importance | 3.881 | 0.634 | .136** | .041 | -.002 | .565** | .193** | | | | | | | | | | |
| 7. Competence Fulfilment | 2.013 | 1.048 | .276** | -.068 | .042 | .202** | .558** | .284** | | | | | | | | | |
| 8. Relatedness Importance | 3.682 | 0.842 | .169** | .213** | .007 | .373** | .202** | .424** | .177** | | | | | | | | |
| 9. Relatedness Fulfilment | 2.187 | 1.128 | .213** | .101* | -.011 | .174** | .362** | .135** | .441** | .430** | | | | | | | |
| 10. Location Importance – Convenience | 2.791 | 0.863 | .298** | .152** | -.037 | .252** | .399** | .220** | .328** | .296** | .389** | | | | | | |
| 11. Location Importance - Safety | 3.182 | 1.012 | .283** | .237** | -.051 | .327** | .385** | .199** | .243** | .322** | .395** | .748** | | | | | |
| 12. Location Importance - Community | 2.428 | 0.932 | .232** | .136** | -.038 | .247** | .406** | .174** | .395** | .305** | .486** | .690** | .749** | | | | |
| 13. Amenity Importance - Infrastructure | 3.199 | 1.040 | .235** | .186** | -.013 | .261** | .287** | .222** | .216** | .285** | .336** | .598** | .591** | .514** | | | |
| 14. Amenity Importance - Exercise | 2.309 | 0.861 | .202** | .101* | -.034 | .168** | .292** | .206** | .344** | .326** | .385** | .612** | .578** | .618** | .662** | | |
| 15. Amenity Importance - Natural Environment | 2.986 | 1.021 | .319** | .120** | -.076 | .204** | .358** | .199** | .315** | .233** | .269** | .366** | .356** | .412** | .584** | .480** | |

*p ≤ 0.05 **p ≤ 0.01

***Table 16:*** *Descriptive Statistics and Correlations – 65 and Over ONLY*

**Pairwise item-by-item bivariate correlations.** Given that some of the correlations between the location subscales and amenity subscales were relatively high, a pairwise item-by-item bivariate correlation analysis (35 items x 35 items) was conducted on all items relating to both location and amenity elements of open space (See Appendix D). Generally speaking, the items within subscales were more highly correlated with each other than with items in other subscales. However, there were a few items that did not follow this pattern, indicating an alternative measurement model might provide increased discriminant validity of open space elements.

To explore this alternative, I began by combining all items pertaining to location into one scale and all items pertaining to amenity into one scale. Using an iterative process, I conducted a series of factor analyses and eliminated items with low factor loadings (below .50) to arrive at a single scale for location and a single scale for amenity. This yielded a 9-item scale for location and a 5-item scale for amenity. None of the pairwise bivariate correlations between items across location and amenity scales were above .40 and scale scores on the two scales were not highly correlated (r=0.399, See Table 17 below), indicating increased discriminant validity. The details for these two new general scales are provided below.

Although use of these general scales increases discriminant validity, at the same time, these general scales reduce precision and do not allow for the more specific determination of open space elements which can be useful in planning and design. Hence, rather than replace the more precise subscales (i.e., for location, these pertain to the separate elements of convenience, community and safety; for amenity these pertain to the separate elements of infrastructure, exercise and natural environment), the general location and amenity scale were used side-by-side with the more specific open space subscales, as a second (alternative) test of each hypothesis

involving open space elements, to provide added confidence regarding potential multicollinearity between the open space elements scales (see Chapter 5).

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. Likelihood of Revisitation | Pearson Correlation | 1 | | | | | |
| 2.Autonomy Fulfillment | Pearson Correlation | .401** | 1 | | | | |
| 3.Competence Fulfillment | Pearson Correlation | .276** | .558** | 1 | | | |
| 4. Relatedness Fulfillment | Pearson Correlation | .213** | .362** | .441** | 1 | | |
| 5. Location – General Items | Pearson Correlation | .287** | .416** | .373** | .459** | 1 | |
| 6. Amenity – General Items | Pearson Correlation | .319** | .358** | .315** | .269** | .399** | 1 |

**Correlation is significant at the 0.01 level (2-tailed).

***Table 17:*** *Correlation – Revisitation, need fulfillment, and open space elements (65 and over)*

***Elements of Open Space Location – General Items.*** To examine the factor structure of the new general scales containing items pertaining to the park's general location elements, I conducted a principal component analysis. All items loaded on a single factor having an Eigenvalue of 3.980 that explained 44.217% of the variation in the data and an inspection of the scree plot supported this solution. Further, all items loaded strongly onto this factor, and Cronbach's Alpha was 0.835 (See Table 18 below). As a result, the score for Open Space Location – General Items for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| The park location was close to my home. | 0.564 |
| The park location was close to public transport. | 0.528 |
| The park was relatively flat and not hilly. | 0.641 |
| The surrounding community was of a similar race or ethnicity to mine. | 0.711 |
| The surrounding community was of a similar social class to mine. | 0.766 |
| The park was within easy driving distance from my home. | 0.599 |
| The surrounding community appeared to be of a similar stage of life (age group) to mine. | 0.710 |
| The park had a strong community atmosphere. | 0.698 |
| The surrounding community felt comfortable and welcoming. | 0.728 |
| Eigenvalue | 3.980 |

***Table 18:*** *Open Space Location – General Items Scale*

***Elements of Open Space Amenity – General Items.*** Again, I conducted a principal component analysis to examine the factor structure of the items pertaining to the park's general amenity elements. All items loaded on a single factor having an Eigenvalue of 2.711 that explained 54.22% of the variation in the data and an inspection of the scree plot once again supported this solution. Further, all items loaded strongly onto this factor, and Cronbach's Alpha was 0.78 (See Table 19 below). As a result, the score for Open Space Amenity – General Items for each respondent was computed as the mean of the items below, using the mean in order to capture the central tendency for the concept.

| Item | Factor Loading |
|---|---|
| **What was your satisfaction based on? Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.** | |
| There were nice views at the park. | 0.794 |
| The park had water features, such as lakes, streams, or fountains. | 0.698 |
| There were good quality trees, shrubs, and other vegetation at the park. | 0.598 |
| There was wildlife at the park. | 0.769 |
| There were gardens and flowers at the park. | 0.803 |
| Eigenvalue | 2.711 |

***Table 19:*** *Open Space Amenity – General Items Scale*

## Interviews

**Interview Methodology.** In addition to survey data, additional interviews provided rich data with which to explore and comprehend further the findings from the survey. This empirical method employed 23 semi-structured interviews with older adults in Perth to explore primary decision junctures in the Open Space "Motivation to Access" Process Model (Refer Figure 2, page 58 for survey intent).

***Interview Sample and Data Collection.*** The same procedures described in conjunction with the preliminary interviews were utilized for this sample (i.e., recruiting through retirement homes, adherence to ethical protocols; semi-structured format). Interview sampling for the final sample was purposive homogenous sampling rather than random (Kuzel, 1992; Morse, 1989). Purposive homogeneous sampling is defined as focusing on one particular subgroup of a population in which all members are similar (Saunders et al., 2012, p.288). In this circumstance,

sampling was conducted to seek out individuals who belonged to the 65 and over age category and most likely had the relevant experience with parks and open space (Denzin & Lincoln, 1994). The purposive homogenous sampling technique outlined in the literature was used specifically as this technique focuses on subgroups of a population and delivers comparative analysis outcomes to highlight differences between the actions, beliefs, and/or preferences of specific subgroups (Miles & Huberman, 1994). In the case of this research project, the primary group is defined as older adults (those adults 65 years and over). Subgroups within the "older adults" primary group contain cases representing male versus female; and varying ethnicities/races or countries of origin. Each case represents a predefined combination of these social groups to ensure comparative analyses. Refer Table 20 below for social group criteria.

| **Interview Targets – represents number of interviews with individuals over the age of 65 (a target of 24 total interviews)** | | | | |
|---|---|---|---|---|
| **Gender** | Female (50%) | | Male (50%) | |
| **Country of Birth** | Australian Born (70%) | Foreign Born (30%) | Australian Born (70%) | Foreign Born (30%) |
| **No. of Interviews** | 8 | 4 | 8 | 4 |

***Table 20:*** *Social Group Criteria for Interviews – targets derived to mirror representation in the population as reported by the Australian Bureau of Statistics*

There were 23 interviews conducted in total. The average age of the interviewees was 74, encompassing an age range of 65 to 89 years old. The social group criteria for interviewees (refer table 20) was closely followed, yielding 13 female interviewees and 10 male interviewees, and 16 Australian-born interviewees and 7 foreign-born interviewees.

As with the preliminary interview sample, interviews were conducted individually, and on average were 45 minutes in length, ranging from 24 minutes to 65 minutes. They were held on site at the person's place of residence, and were tape recorded and transcribed verbatim, resulting in 359 pages of text data. The interviews explored similar themes presented earlier (See page 59). (See Appendix A, p. 208, for interview protocol). Analysis of interviews is presented in Chapter 6.

# CHAPTER 5: QUANTITATIVE ANALYSIS AND RESULTS

In this chapter, I document the analysis and results for the three sets of tests conducted for the five hypotheses to delineate the extent of support for the model in Figure 1 (see page 43). By way of overview, a combination of Analysis of Variance (ANOVA), Analysis of Covariance (ANCOVA), and Linear Multiple Regression, including mediation analysis (Baron & Kenney, 1986) and Hierarchical Linear Regression (Tabachnick & Fidell, 2013) were used to test the hypotheses, with analysis being conducted in SPSS v23. These tests were conducted first on the six specific subscales for location and amenity, next using the general scales for location and amenity, and finally, on each gender separately based on the preliminary results described below. Table 64 at the end of this chapter summarizes the results of the quantitative tests of hypotheses. These quantitative results are then triangulated and elaborated upon using qualitative methods in Chapter 6.

The Chapter that follows is divided into three sections. The first section documents the analysis and results for the initial hypothesis tests conducted using the six specific scales for open space elements that were initially developed. These elements were chosen based on interview findings that indicated that location-community, location-convenience, location-safety, amenity-infrastructure, amenity-exercise, and amenity-natural environment were important aspects of the open space experience for interviewees. As described in the previous chapter, these six survey subscales were found to be individually strong in terms of reliability and factor structure, but because certain items in several subscales were correlated with items in other subscales, two general scales were also developed, which demonstrated high discriminant validity, as well as adequate reliability and factor structure. Therefore, as an alternative additional test of the hypotheses, the second section of the chapter documents the re-analysis

results of the second set of hypothesis testing using these general scales. The final section of this chapter addresses variations in results for men versus women in the 65 and over age group.

Included in each of the multivariate analyses are extensive collinearity diagnostics which are provided in SPSS v23. Very high multicollinearity could increase the standard errors of regression coefficients and result in the instability of a model. To determine if collinearity is of concern, literature suggests examining several diagnostics provided in SPSS, such as bivariate correlations, the Condition Index (CI) and Variance Inflation Factor (VIF). If standard criteria are met, the results are considered to be free of problems. Green et al. (1988) and Lehmann et al. (1998) respectively recommend 0.9 and 0.7 as an appropriate threshold for bivariate correlations among independent variables in the regression model as indicative of harmful effects. Belsley et al. (1980) and Johnston (1984) recommend that condition indices (CI) less than 20 are not problematic. Hair et al. (1995) recommend variance inflation factors (VIF) less than 10 indicate inconsequential collinearity.

In particular, the VIF has become a standard indicator of multicollinearity. VIF assesses how much the variance of an estimated regression coefficient increases if predictors are correlated. If no factors are correlated, the VIFs will all be 1. Again, the most common rule of thumb for VIF as an indicator of multicollinearity is "the rule of 10" which suggests that in any model, it is only when VIF are above 10 that there is cause for concern in interpreting the model (Tabachnick & Fidell, 2013; O'Brien, 2007; Friedman & Wall, 2005).

As indicated in the tables below, none of the collinearity diagnostics suggest that multicollinearity is a problem in the multivariate models. For example, none of the VIF for the variables in the models was above 3.38, well below the rule of 10 threshold. Given it is only

those VIF above 10 that are regarded by many scholars as a sign of severe or serious multi-collinearity, results indicate that there is little cause for concern in this sample and that the regression models are stable and interpretable. This is true for all three sets of analyses, including the analyses performed with the six specific subscales for open space elements.

## Section 1 – Specific Open Space Elements Analysis and Results

### i. Hypothesis 1 - Importance of Needs

Hypothesis 1 proposed that age influences the importance placed on autonomy, competence, and relatedness needs, with older adults placing more importance on autonomy, followed by competence and relatedness, with the acknowledgement that importance of needs may be a result of an interaction among demographic characteristics, including age, gender, and culture. To test this hypothesis, I first conducted a series of three analyses of variance to determine if the importance of each of the three needs (autonomy, competence, and relatedness) varies significantly across age groups (See Table 21 below). Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences among group means, including variation among and between groups. The dependent variable in each of the models was the scale score for the importance of the need; the independent variable was the age categorization (1= under 65, 2= 65 and over).

Results indicated that only the **need for autonomy** varied significantly by age ($F=4.46$, $p<0.05$). The need for autonomy was significantly more important for adults aged 65 and over than for younger adults ($m=4.17$ for 65 and over, as compared to $m=4.09$ for under 65). The need for competence and the need for relatedness did not differ in importance across the two age

groups (See Table 22 below). Further, for the 65 and over age group, autonomy was the most important need (m=4.17), followed by competence (m=3.88), then relatedness (m=3.68).

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Need for Autonomy Importance | Between Groups | 1.673 | 1 | 1.673 | 4.460 | .035 |
| | Within Groups | 388.755 | 1036 | .375 | | |
| | Total | 390.428 | 1037 | | | |
| Need for Competence Importance | Between Groups | .382 | 1 | .382 | .775 | .379 |
| | Within Groups | 510.161 | 1036 | .492 | | |
| | Total | 510.543 | 1037 | | | |
| Need for Relatedness Importance | Between Groups | .028 | 1 | .028 | .038 | .846 |
| | Within Groups | 760.533 | 1036 | .734 | | |
| | Total | 760.560 | 1037 | | | |

***Table 21:*** *ANOVA - Variance in Needs Importance across Age Groups*

| | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | 95% Confidence Interval of the Difference | |
| Need | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Need for Autonomy Importance | -2.112 | 1036 | .035 | -.08031 | .03803 | -.15493 | -.00569 |
| Need for Competence Importance | -.881 | 1036 | .379 | -.03836 | .04356 | -.12384 | .04713 |
| Need for Relatedness Importance | -.195 | 1036 | .846 | -.01036 | .05319 | -.11474 | .09401 |

***Table 22:*** *T-test - needs importance for adults under 65 as compared to adults 65 and over.*

**Gender and Culture as Covariates.** Given the literature reviewed previously regarding the potential importance of gender and culture, the analysis of variance for the importance of autonomy was also conducted with covariates for gender and country of origin. As discussed previously, country of origin was implicated in the interviews as the key cultural variable of interest in this societal context (See Table 23 below). Analysis of covariance (ANCOVA) allows the comparison of the scores on the dependent variable across groups, taking into account (or in

order to correct for) variability of other variables, called covariates. In this analysis, the importance of the need for autonomy was the dependent variable, age was the focal independent variable (comparing those under 65 with those 65 and over), and gender and country of origin were the covariates.

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Corrected Model | 6.505[a] | 3 | 2.168 | 5.840 | .001 | .017 |
| Intercept | 1335.526 | 1 | 1335.526 | 3596.907 | .000 | .777 |
| Gender | 4.655 | 1 | 4.655 | 12.538 | .000 | .012 |
| Country of Origin | .126 | 1 | .126 | .340 | .560 | .000 |
| Age | 2.107 | 1 | 2.107 | 5.674 | .017 | .005 |
| Error | 383.923 | 1034 | .371 | | | |
| Total | 18106.313 | 1038 | | | | |
| Corrected Total | 390.428 | 1037 | | | | |

Dependent Variable: Need for Autonomy Importance
a. R Squared = .017 (Adjusted R Squared = .014)

***Table 23:*** *Tests of Between-Subjects Effects – age, gender, and country of origin*

Results of the analysis of covariance indicate that the importance of the need for autonomy varies significantly across age groups, even when gender and country of origin are included in the model. Importance of autonomy did not vary across country of origin ($F=.34$, $p=0.56$). As a result, country of origin is not considered further in the analysis in this chapter given it does not appear to be related to the relationships proposed. This issue is returned to in the discussion.

However, it is interesting to note that the importance of autonomy did vary across genders ($F=12.54$, $p<.001$). In the population as a whole, the importance of the need for autonomy was significantly greater for females than males ($t= -3.375$, $p<0.001$, males $m=4.07$, females $m=4.20$). However, interestingly, when the sample was divided based on age, the difference between genders was not significant for the adults under 65 ($t= -1.328$, ns, males

m=4.05, females m=4.13), and yet the difference between genders was significant for the adults aged 65 and over (t= -3.920 p<0.001, males m=4.08, females m=4.28).

These analyses confirm Hypothesis 1 that the need for autonomy varied based on age, indeed it was the only need that varied based on age. The need for autonomy also varied based on gender for adults aged 65 and over, but for both genders, autonomy was the most important need, relative to the other needs. With this evidence, the remainder of the analysis focuses on the 65 and over age group and the fulfilment of the need for autonomy, given it is likely the most important need to understand if we are to increase visitation rates for this group.

### ii. Hypothesis 2 - Attributes of Open Space Which Result in Need Fulfilment.

The analysis now shifts from understanding the importance of the need for autonomy to an analysis of what might fulfil the need for autonomy in older adults. Understanding which specific elements of open space are related to autonomy need fulfilment is an important step toward developing targeted implications for practice that will help to increase visitation.

To that end, Hypothesis 2 focused on the six specific elements (three pertaining to location and three pertaining to amenities) provided in open space, predicting that the favorable evaluation of these elements of open space location and amenities is related to fulfillment of autonomy needs. As reviewed in the Methods Chapter, preliminary interviews implicated three specific elements of open space location (convenience, safety, and community) and three specific types of amenities (infrastructure, exercise, and natural environment). Therefore, I developed survey scales to measure the extent to which respondents viewed these as contributing to their experience of the open space. The correlation matrix (Table 24 below) begins to provide some

clues as to which of these open space amenities contribute to the fulfilment of the need for autonomy (refer column 2). The strongest correlations with autonomy need fulfillment were for the elements of location relating to convenience ($r=0.40$, $p<0.001$), community ($r=0.41$, $p<0.001$), and safety ($r=0.39$, $p<0.001$) along with amenity elements relating to the natural environment ($r=0.36$, $p<0.001$).

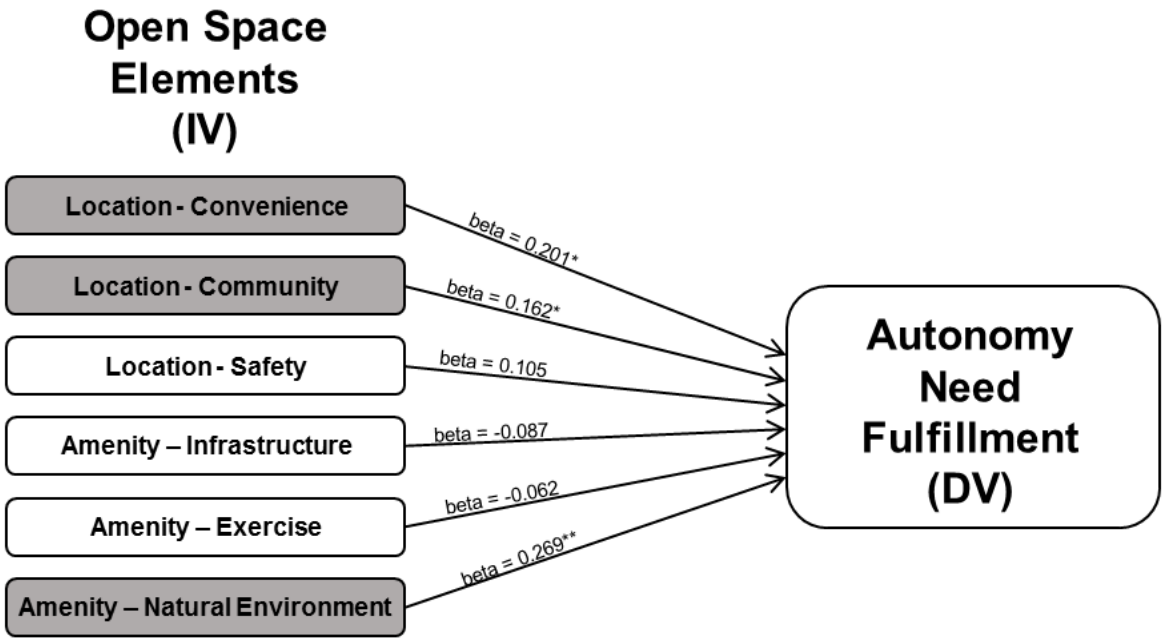
To further examine which elements of parks and open space predict the fulfillment of autonomy needs in adults aged 65 and over, I conducted linear multiple regression using autonomy need fulfilment as the dependent variable (DV) and the six elements of open space (location-convenience, location-community, location-safety, amenity-infrastructure, amenity-exercise, and amenity-natural environment) as the independent variables (IV). Multiple linear regression attempts to model the relationship between two or more explanatory variables and a dependent variable by fitting a linear equation to observed data. Each value of the independent variable is associated with a value of the dependent variable.

Together, these six elements (See tables 25, 26, & 27 below) predicted a significant portion of variance in autonomy need fulfillment ($R^2=0.24$, $F=26.75$, $p<0.001$). Among the six elements, natural environment was the strongest predictor of autonomy need fulfillment ($b=0.269$, $t=5.498$, $p<0.001$), followed by convenience ($b=0.201$, $t=3.126$, $p<0.001$), then community ($b=0.162$, $t=2.508$, $p<0.001$). Elements of infrastructure, exercise, and safety did not contribute significantly to variance in autonomy need fulfilment (See Figure 3 below).

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Likelihood of revisitation | Pearson Correlation | 1 | | | | | | | | | |
| 2.Autonomy Fulfillment | Pearson Correlation | .401** | 1 | | | | | | | | |
| 3.Competence Fulfillment | Pearson Correlation | .276** | .558** | 1 | | | | | | | |
| 4. Relatedness Fulfillment | Pearson Correlation | .213** | .362** | .441** | 1 | | | | | | |
| 5. Location Convenience | Pearson Correlation | .298** | .399** | .328** | .389** | 1 | | | | | |
| 6. Location Community | Pearson Correlation | .232** | .406** | .395** | .486** | .690** | 1 | | | | |
| 7. Location Safety | Pearson Correlation | .283** | .385** | .243** | .395** | .748** | .749** | 1 | | | |
| 8. Amenity Infrastructure | Pearson Correlation | .235** | .287** | .216** | .336** | .598** | .514** | .591** | 1 | | |
| 9. Amenity Exercise | Pearson Correlation | .202** | .292** | .344** | .385** | .612** | .618** | .578** | .662** | 1 | |
| 10. Amenity Natural Environment | Pearson Correlation | .319** | .358** | .315** | .269** | .366** | .412** | .356** | .584** | .480** | 1 |

N=525 **. Correlation is significant at the 0.01 level (2-tailed).

***Table 24:*** *Correlation – Revisitation, need fulfillment, and open space elements (65 and over)*




* Significant at p<0.05
** Significant at p<0.001

***Figure 3:*** *Autonomy need fulfillment of adults aged 65 and over across all elements of Open Space.*

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .491[a] | .241 | .232 | .99213 |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 25:*** *Regression Model Summary – Autonomy fulfillment of adults aged 65 and over across all elements of Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 157.990 | 6 | 26.332 | 26.751 | .000[b] |
| | Residual | 498.068 | 506 | .984 | | |
| | Total | 656.057 | 512 | | | |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 26:*** *ANOVA Autonomy fulfillment of adults aged 65 and over across all elements of Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | .977 | .175 | | 5.580 | .000 | .633 | 1.321 | | |
| | Location Convenience | .263 | .084 | .201 | 3.126 | .002 | .098 | .428 | 2.744 | 8.559 |
| | Location Community | .197 | .078 | .162 | 2.508 | .012 | .043 | .351 | 2.782 | 10.201 |
| | Amenity Infrastructure | -.095 | .066 | -.087 | -1.433 | .152 | -.225 | .035 | 2.476 | 13.406 |
| | Amenity Exercise | -.082 | .077 | -.062 | -1.067 | .286 | -.232 | .069 | 2.269 | 16.391 |
| | Amenity Natural Environment | .297 | .054 | .269 | 5.498 | .000 | .191 | .404 | 1.594 | 18.206 |
| | Location Safety | .117 | .077 | .105 | 1.529 | .127 | -.033 | .268 | 3.144 | 11.743 |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 27:*** *Regression Coefficients – Autonomy fulfillment of adults aged 65 and over across all elements of Open Space.*

To summarize, these analyses support Hypothesis 2 that elements of park location and amenities are related to fulfilment of the need for autonomy. Further, the specificity of the scales developed to measure specific elements of open space allowed for more refined results, with findings indicating specifically that the **convenience of the location** (proximity to home and public transit, accessibility by car or on foot, clearly marked entrances, and convenient parking), the **community surrounding the location** (similar race, ethnicity, social class, and stage of life, appearance of importance to the community, strength of community atmosphere, and welcoming community), and the **natural environment amenities** (presence of views, water features, good quality vegetation, wildlife, and gardens/flowers), were the strongest predictors of fulfilment of the need for autonomy among older adults aged 65 and over.

### iii. Hypothesis 3 - Relationship of Need Fulfillment to Revisitation.

The next step in the analysis was to investigate the argument that when needs are fulfilled, visitors are likely to return to the open space. Hypothesis 3 stated that fulfillment of psychological needs during open space visitation will be related to the likelihood of revisiting the open space in the future. In particular, it was anticipated that among older adults, autonomy need fulfilment would predict revisitation. I conducted a linear multiple regression analysis to test this hypothesis. The dependent variable in this model is likelihood of revisitation. The three independent variables are autonomy fulfillment, competence fulfillment, and relatedness fulfillment. Together, fulfillment of the three needs predicted a significant amount of variance in revisitation ($R^2$ = .168, F=35.10, p<.001). Examining the individual beta coefficients for the three needs, only fulfillment of the need for autonomy predicted revisitation (b = .35, t=7.16, p<.001).

These analyses support Hypothesis 3 (see Tables 28, 29, and 30 below), indicating that when autonomy needs are fulfilled in adults aged 65 and over, revisitation to open space is likely. In addition, the analysis supports the hypothesis that autonomy need fulfillment is more strongly related to open space revisitation than needs relating to competence or relatedness, given the beta coefficients for these two variables were much lower and were not statistically significant.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .410[a] | .168 | .163 | .948 |

a. Predictors: (Constant), Relatedness Fulfillment, Autonomy Fulfillment, Competence Fulfillment

***Table 28:*** *Regression Model Summary – Likelihood of Revisitation due to need fulfillment in adults aged 65 and over.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 94.650 | 3 | 31.550 | 35.100 | .000[b] |
| | Residual | 468.302 | 521 | .899 | | |
| | Total | 562.952 | 524 | | | |

a. Dependent Variable: Likelihood of revisitation

b. Predictors: (Constant), Relatedness Fulfillment, Autonomy Fulfillment, Competence Fulfillment

***Table 29:*** *ANOVA – Likelihood of Revisitation due to need fulfillment in adults aged 65 and over.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | 3.291 | .125 | | 26.335 | .000 | 3.046 | 3.537 | | |
| | Autonomy Fulfillment | .321 | .045 | .349 | 7.156 | .000 | .233 | .409 | 1.489 | 5.394 |
| | Competence Fulfillment | .053 | .050 | .054 | 1.057 | .291 | -.045 | .151 | 1.606 | 5.669 |
| | Relatedness Fulfillment | .058 | .041 | .063 | 1.390 | .165 | -.024 | .139 | 1.272 | 8.086 |

a. Dependent Variable: Likelihood of Revisitation

***Table 30:*** *Regression Coefficients – Likelihood of Revisitation due to need fulfillment in adults aged 65 and over.*

### iv. Hypothesis 4 - Need Fulfilment as Mediator of the Relationship between Open Space Elements and Revisitation.

Beyond the direct effects, Hypothesis 4 investigated the idea that elements of open space are related to need fulfilment, which in turn, is related to open space revisitation. Formally stated, Hypothesis 4 predicted that the relationship between open space location and amenities and the likelihood of revisitation will be partially mediated by fulfillment of needs for autonomy, competence, and relatedness during a previous visit. For older adults, the strongest relationships will occur for fulfilment of autonomy needs.

To test this hypothesis, mediated regression analyses were conducted (See Baron & Kenney, 1986). The focus was on the three specific elements of open space (location - convenience, location - community, and amenities - natural environment) that had been shown in the above analysis to have implications for autonomy need fulfillment. In this analysis the first step is to show that the Independent Variables (IV) are related to the mediator. This is shown in table 27 above for the elements of Convenience ($b=0.201$, $p<0.05$), Community ($b=0.162$, $p=<0.05$), and Natural Environment ($b=0.269$, $p<0.001$). These elements were all significant predictors of autonomy need fulfilment.

The next step in mediation analysis is to show that the IV's are significant predictors of the dependent variable (DV) Revisitation. The mediation analysis output is shown in tables 31, 32, and 33 below. The three elements of open space, when combined, predicted significant variance in revisitation ($R^2=0.140$, $F=27.565$, $p<0.001$). Examining the beta coefficient for each element individually indicated that only elements relating to Convenience ($b=0.223$, $t=3.902$, $p<0.001$) and Natural Environment ($b=0.247$, $t=5.424$, $p<0.001$) predicted revisitation.

The third step in mediation analysis is to confirm that the mediator (autonomy need fulfilment) is a significant predictor of the DV (Revisitation). As per Table 33 – Mediation Regression Coefficients, this step was confirmed ($b=0.301$, $t=6.688$, $p<0.001$).

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .374[a] | .140 | .135 | .971 | .140 | 27.565 | 3 | 509 | .000 |
| 2 | .458[b] | .209 | .203 | .932 | .070 | 44.730 | 1 | 508 | .000 |

a. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience, Location-Community.
b. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience, Location-Community, Autonomy Fulfillment.

***Table 31:*** *Mediation Regression Analysis Model Summary (Adults aged 65 and over) – Mediation effects on visitation to Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 77.946 | 3 | 25.982 | 27.565 | .000[b] |
| | Residual | 479.774 | 509 | .943 | | |
| | Total | 557.719 | 512 | | | |
| 2 | Regression | 116.771 | 4 | 29.193 | 33.632 | .000[c] |
| | Residual | 440.948 | 508 | .868 | | |
| | Total | 557.719 | 512 | | | |

a. Dependent Variable: Likelihood of Revisitation
b. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience, Location-Community
c. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience, Location-Community, Autonomy Fulfillment

***Table 32:*** *Mediation Regression Analysis ANOVA Output – Aged 65 and over – Mediation effects on visitation to Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part | VIF | CI |
| 1 | (Constant) | 3.025 | .166 | | 18.242 | .000 | 2.700 | 3.351 | | | | | 1.000 |
| | Location-Convenience | .270 | .069 | .223 | 3.902 | .000 | .134 | .406 | .298 | .170 | .160 | 1.937 | 16.951 |
| | Location-Community | -.026 | .065 | -.023 | -.394 | .693 | -.154 | .103 | .232 | -.017 | -.016 | 2.019 | 8.298 |
| | Amenity-Natural Environment | .251 | .046 | .247 | 5.424 | .000 | .160 | .343 | .319 | .234 | .223 | 1.223 | 11.388 |
| 2 | (Constant) | 2.751 | .164 | | 16.741 | .000 | 2.428 | 3.074 | | | | | 1.000 |
| | Location-Convenience | .200 | .067 | .165 | 2.977 | .003 | .068 | .332 | .298 | .131 | .117 | 1.985 | 7.514 |
| | Location-Community | -.088 | .063 | -.078 | -1.381 | .168 | -.212 | .037 | .232 | -.061 | -.054 | 2.063 | 7.961 |
| | Amenity-Natural Environment | .184 | .046 | .180 | 4.033 | .000 | .094 | .274 | .319 | .176 | .159 | 1.286 | 9.278 |
| | Autonomy Fulfillment | .278 | .041 | .301 | 6.688 | .000 | .196 | .359 | .401 | .284 | .264 | 1.301 | 12.682 |

a. Dependent Variable: Likelihood of Revisitation

***Table 33:*** *Mediation Regression Coefficients – Aged 65 and over – Mediation effects on visitation to Open Space.*

The final step in mediation analysis is to determine if the strength of relationship between the IV's (elements of Open Space) and the DV (Revisitation) is reduced (indicating partial mediation) or becomes non-significant (full mediation) when the mediator is in the model. In support of partial mediation, the beta coefficient of Convenience was reduced (from b=0.2253 to b=0.165) but was still statistically significant, with autonomy need fulfillment in the model. Likewise, the beta coefficient of Natural Environment was reduced (from b=0.247 to b=0.180) but was still statistically significant with autonomy need fulfilment in the model (See Figure 4 – Final Mediation Model below).

In support of Hypothesis 4, this indicated that elements of Convenience and Natural Environment influence revisitation at least partially through their influence on autonomy need fulfillment. However, they also have a direct relationship with revisitation suggesting that although autonomy need fulfillment is one mechanism by which these elements influence revisitation, there are potentially other mechanisms through which they influence revisitation.

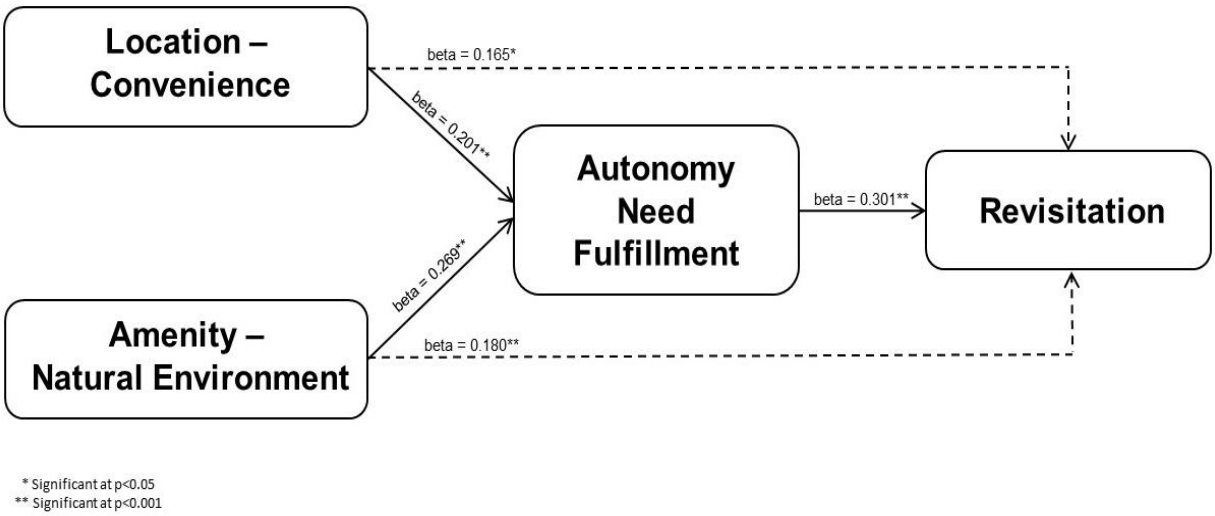



***Figure 4:*** *Final Mediation Model*

### v. Hypothesis 5 - Need Importance as a Moderator.

Although it was proposed previously that there is a positive relationship between autonomy need fulfillment and revisitation, the final set of analyses investigated the idea that this relationship changes based on how important the need in question is to the individual. Specifically, Hypothesis 5 argued that the relationship between autonomy need fulfillment and revisitation is stronger, the more important the need for autonomy to the individual (i.e., need importance moderates the relationship between need fulfillment and revisitation). To test this hypothesis, a moderated regression analysis was conducted (See Baron & Kenney, 1986). This

analysis tested whether the importance of the need for autonomy changes the strength of the relationship between fulfillment of the need for autonomy and revisitation. The moderation analysis is shown in Tables 34, 35, and 36 below.

In the first step of the model, the main effect for autonomy need fulfillment is entered. In the second step, the moderator (importance of the need for autonomy) is added. Finally, in the third step, the multiplicative interaction between importance of need for autonomy and autonomy need fulfillment are entered. In the final step of the model, a significant portion of the variance in the likelihood of revisitation was predicted ($R^2$ in the final step=0.15, F=59.24, p<0.001). The beta coefficient for interaction term was statistically significant (b=0.56, t=-2.53, p<0.01). Further, the change in $R^2$ on the final step of the model confirmed that the interaction effect representing the moderating relationship explains significant additional variance in revisitation beyond the direct effects (change in $R^2$=.01, F=6.42, p<.05). This provides evidence that the moderating effect of the level of Autonomy Importance experienced by an individual changes the nature of the relationship between autonomy need fulfillment and revisitation to open space, supporting Hypothesis 5.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .357[a] | .128 | .127 | .952 | .128 | 151.629 | 1 | 1036 | .000 |
| 2 | .376[b] | .141 | .140 | .945 | .014 | 16.513 | 1 | 1035 | .000 |
| 3 | .383[c] | .147 | .144 | .942 | .005 | 6.421 | 1 | 1034 | .011 |

a. Predictors: (Constant), Autonomy Fulfillment
b. Predictors: (Constant), Autonomy Fulfillment, Autonomy Importance
c. Predictors: (Constant), Autonomy Fulfillment, Autonomy Importance, Autonomy Fulfillment x Autonomy Importance

***Table 34:*** *Moderation Regression Analysis Model Summary – Under 65 and 65 and over – Moderating effects on revisitation to Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 137.359 | 1 | 137.359 | 151.629 | .000[b] |
| | Residual | 938.507 | 1036 | .906 | | |
| | Total | 1075.866 | 1037 | | | |
| 2 | Regression | 152.098 | 2 | 76.049 | 85.206 | .000[c] |
| | Residual | 923.768 | 1035 | .893 | | |
| | Total | 1075.866 | 1037 | | | |
| 3 | Regression | 157.799 | 3 | 52.600 | 59.242 | .000[d] |
| | Residual | 918.067 | 1034 | .888 | | |
| | Total | 1075.866 | 1037 | | | |

a. Dependent Variable: Likelihood of revisitation
b. Predictors: (Constant), Autonomy Fulfillment
c. Predictors: (Constant), Autonomy Fulfillment, Autonomy Importance
d. Predictors: (Constant), Autonomy Fulfillment, Autonomy Importance, Autonomy Fulfillment x Autonomy Importance

***Table 35:*** *Moderation Regression Analysis ANOVA Output (Under 65 and 65 and over) – Moderating effects on revisitation to Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | 3.406 | .086 | | 39.499 | .000 | 3.237 | 3.575 |
| | Autonomy Fulfillment | .331 | .027 | .357 | 12.314 | .000 | .278 | .383 |
| 2 | (Constant) | 2.670 | .200 | | 13.329 | .000 | 2.277 | 3.063 |
| | Autonomy Fulfillment | .293 | .028 | .316 | 10.361 | .000 | .237 | .348 |
| | Autonomy Importance | .206 | .051 | .124 | 4.064 | .000 | .106 | .305 |
| 3 | (Constant) | 1.478 | .511 | | 2.893 | .004 | .476 | 2.481 |
| | Autonomy Fulfillment | .733 | .176 | .793 | 4.161 | .000 | .388 | 1.079 |
| | Autonomy Importance | .494 | .124 | .297 | 3.971 | .000 | .250 | .738 |
| | Autonomy Fulfillment x Autonomy Importance | -.105 | .041 | -.563 | -2.534 | .011 | -.186 | -.024 |

a. Dependent Variable: Likelihood of revisitation

***Table 36:*** *Moderation Regression Coefficients – Under 65 and 65 and over – Moderating effects on revisitation to Open Space.*

To interpret the nature of interaction effect, the sample was divided into two subgroups: those one standard deviation above the mean on autonomy need importance (m=4.13; sd=.61) and those one standard deviation below the mean on autonomy need importance. Then the relationship between autonomy need fulfillment and revisitation for each group was compared. As expected, the relationship between autonomy need fulfillment and revisitation is stronger for those with a high need for autonomy (r=.36) than for those with a low need for autonomy (r=.29) (See Figure 5 below).

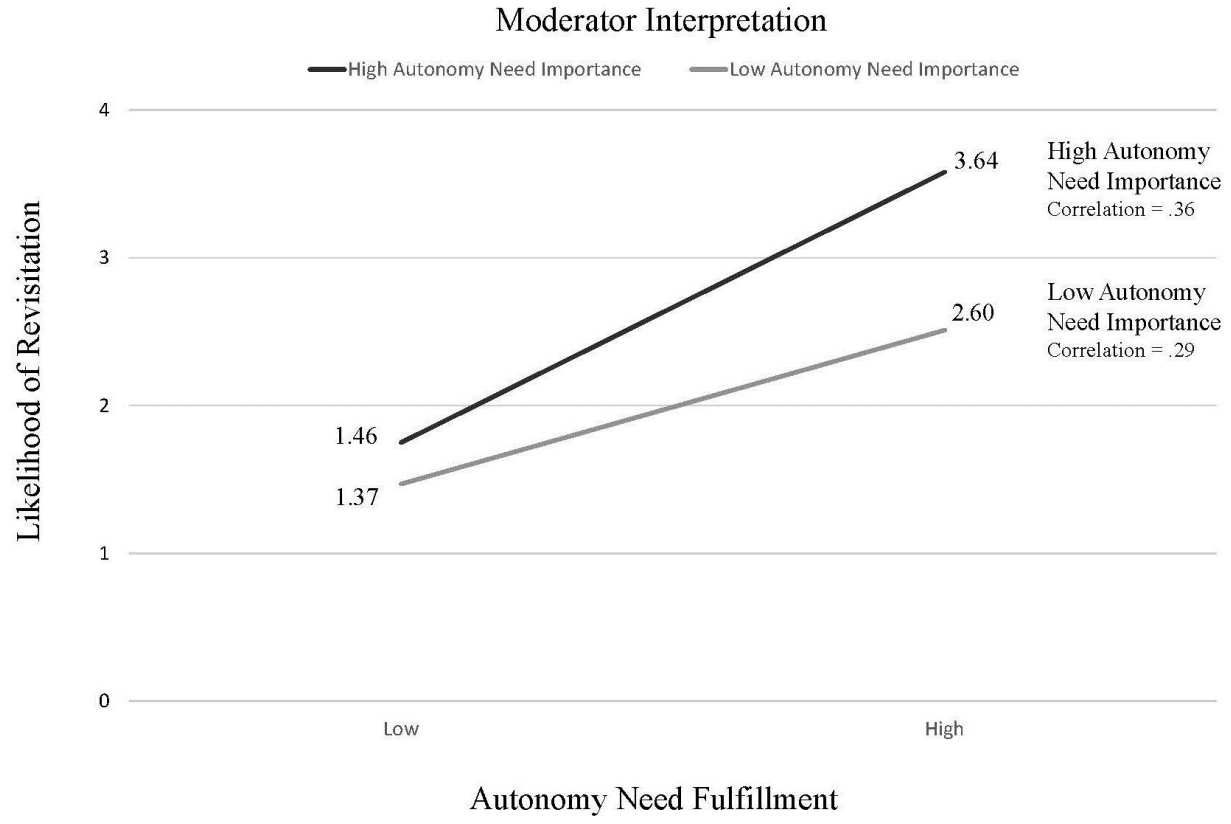



***Figure 5:*** *Moderator Interpretation*

## Section 2 – General Scale Analysis and Results

The general scales for location and amenity of open space that were developed as indicated in the methods chapter are pertinent only to relationships involving the open space attributes, which include hypothesis 2 and hypothesis 4. As such, the following analysis and results pertain only to those two hypotheses. These results are presented as an alternative test of these two hypotheses, and given the two general scales were only weakly correlated, these analyses provided added confidence regarding any potential concerns over multicollinearity. Results of these analyses with the general scales replicate those above conducted with the specific subscales for open space. Thus, in addition to the provision of the collinearity diagnostics above (which also indicated collinearity was unproblematic), these set of analyses increase the strength of the final conclusions of the study.

### i. Hypothesis 2 - Attributes of Open Space Which Result in Need Fulfilment (General Scales).

Based upon correlations among scales noted in the methods chapter, I utilized additional survey scales using general items of location and amenity to measure the extent to which respondents viewed these as contributing to their experience of the open space.

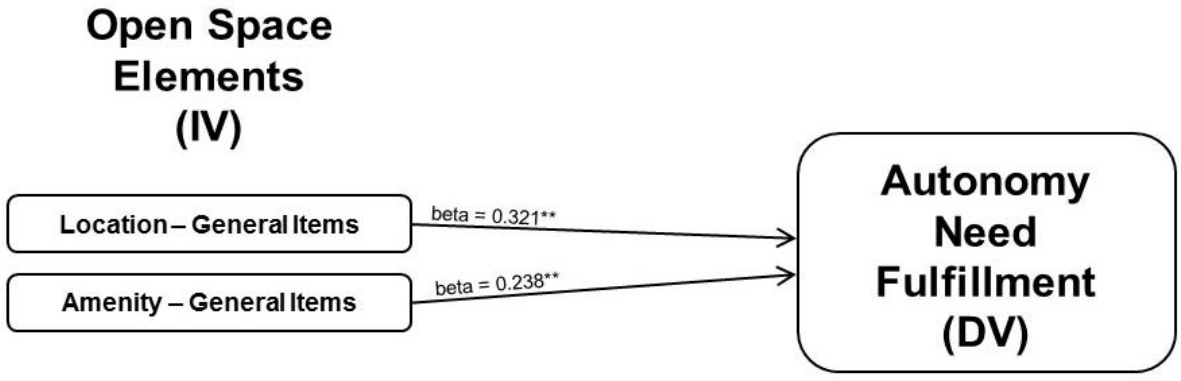
In terms of relationships between need fulfilment and elements of open space, the strongest bivariate correlations with autonomy need fulfillment were for location ($r=0.416$, $p<0.01$) (See Table 37 below).

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. Likelihood of Revisitation | Pearson Correlation | 1 | | | | | |
| 2.Autonomy Fulfillment | Pearson Correlation | .401** | 1 | | | | |
| 3.Competence Fulfillment | Pearson Correlation | .276** | .558** | 1 | | | |
| 4. Relatedness Fulfillment | Pearson Correlation | .213** | .362** | .441** | 1 | | |
| 5. Location – General Items | Pearson Correlation | .287** | .416** | .373** | .459** | 1 | |
| 6. Amenity – General Items | Pearson Correlation | .319** | .358** | .315** | .269** | .399** | 1 |

**Correlation is significant at the 0.01 level (2-tailed).

***Table 37:*** *Correlation – Revisitation, need fulfillment, and open space elements (aged 65 and over) – General Scales*

The linear multiple regression analyses using autonomy need fulfilment as the dependent variable (DV) and the two elements of open space (location and amenity) as the independent variables (IV) indicated that these two elements (See tables 38, 39, & 40 below) again predicted a significant portion of variance in autonomy need fulfillment ($R^2$=0.22, F=72.089, p<0.001). Among the two elements, location was the strongest predictor of autonomy need fulfillment (b=0.321, t=7.526, p<0.001), followed by amenity (b=0.238, t=5.572, p<0.001) (See Figure 6 below).




** Significant at p<0.001

***Figure 6:*** *Autonomy need fulfillment of adults aged 65 and over across all general elements of Open Space.*

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .469 | .220 | .217 | 1.00143 |

***Table 38:*** *Regression Model Summary – Autonomy fulfillment of adults aged 65 and over across all general elements of Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 144.593 | 2 | 72.296 | 72.089 | .000 |
| | Residual | 511.464 | 510 | 1.003 | | |
| | Total | 656.057 | 512 | | | |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 39:*** *ANOVA Autonomy fulfillment of adults aged 65 and over across all general elements of Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | 1.035 | .166 | | 6.223 | .000 | .708 | 1.362 | | 1.000 |
| | Location – General Items | .442 | .059 | .321 | 7.526 | .000 | .327 | .558 | 1.190 | 6.922 |
| | Amenity – General Items | .263 | .047 | .238 | 5.572 | .000 | .170 | .355 | 1.190 | 7.885 |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 40:*** *Regression Coefficients – Autonomy fulfillment of adults 65 and over across all elements general of Open Space.*

In summary, these additional analyses mirror those above which used the six specific subscales for elements of open space, and support Hypothesis 2 that location and amenities are related to fulfilment of the need for autonomy. Although, utilizing the general open space scales

relating to location and amenity reduces the specificity of the findings, the results contribute to our understanding of the interactions between older adults 65 and over and open space.

### ii. Hypothesis 4 - Need Fulfilment as Mediator of the Relationship between Open Space Elements and Revisitation.

The alternative test of Hypothesis 4 also mirrors the tests presented earlier. In this analysis the first step is to show that the Independent Variables (IV) are related to the mediator. This is shown in table 40 above for location (b=0.321, p<0.001) and amenity (b=0.238, p=<0.001). These elements were both significant predictors of autonomy need fulfilment.

The next step in mediation analysis is to show that the IV's are significant predictors of the dependent variable (DV) Revisitation. The mediation analysis output is shown in tables 41, 42, and 43 below. When combined, the two elements of open space (Location and Amenity) predicted significant variance in revisitation (R2=0.132, F=38.842, p<0.001). Examining the beta coefficient for each open space element individually indicated that both elements, Location (b=0.190, t=4.232, p<0.001) and Amenity (b=0.243, t=5.398, p<0.001), predicted revisitation.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .364[a] | .132 | .129 | .974 | .132 | 33.842 | 2 | 510 | .000 |
| 2 | .449[b] | .202 | .197 | .935 | .070 | 44.484 | 1 | 509 | .000 |

a. Predictors: (Constant), Location – General Items, Amenity – General Items.
b. Predictors: (Constant), Location – General Items, Amenity – General Items, Autonomy Fulfillment.

***Table 41:*** *Mediation Regression Analysis Model Summary (Ages 65 and Over) – Mediation effects on visitation to Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 73.723 | 2 | 36.862 | 38.842 | .000[b] |
| | Residual | 483.996 | 510 | .949 | | |
| | Total | 557.719 | 512 | | | |
| 2 | Regression | 112.623 | 3 | 37.541 | 42.931 | .000[c] |
| | Residual | 445.097 | 509 | .874 | | |
| | Total | 557.719 | 512 | | | |

a. Dependent Variable: Likelihood of Revisitation
b. Predictors: (Constant), Location – General Items, Amenity – General Items.
c. Predictors: (Constant), Location – General Items, Amenity – General items, Autonomy Fulfillment

***Table 42:*** *Mediation Regression Analysis ANOVA Output – Ages 65 and over – Mediation effects on visitation to Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part | VIF | CI |
| 1 | (Constant) | 3.105 | .162 | | 19.189 | .000 | 2.787 | 3.423 | | | | | 1.000 |
| | Location-General Items | .242 | .057 | .190 | 4.232 | .000 | .130 | .354 | .287 | .184 | .175 | 1.190 | 6.922 |
| | Amenity-General Items | .248 | .046 | .243 | 5.398 | .000 | .158 | .338 | .319 | .232 | .223 | 1.190 | 7.885 |
| 2 | (Constant) | 2.820 | .161 | | 17.501 | .000 | 2.503 | 3.136 | | | | | 1.000 |
| | Location-General items | .120 | .058 | .094 | 2.073 | .039 | .006 | .234 | .287 | .092 | .082 | 1.322 | 7.056 |
| | Amenity-General Items | .175 | .045 | .172 | 3.863 | .000 | .086 | .264 | .319 | .169 | .153 | 1.262 | 8.021 |
| | Autonomy Fulfillment | .276 | .041 | .299 | 6.670 | .000 | .195 | .357 | .401 | .283 | .264 | 1.283 | 9.059 |

a. Dependent Variable: Likelihood of Revisitation

***Table 43:*** *Mediation Regression Coefficients – Ages 65 and over – Mediation effects on visitation to Open Space.*

The third step in mediation analysis is to confirm that the mediator (autonomy need fulfilment) is a significant predictor of the DV (Revisitation). As per Table 43 – Mediation Regression Coefficients (above), this step was confirmed (b=0.299, t=6.670, p<0.001).

The final step in mediation analysis is to determine if the strength of relationship between the IV's (two elements of Open Space) and the DV (Revisitation) is reduced (indicating partial mediation) or becomes non-significant (full mediation) when the mediator is in the model. In support of partial mediation, the beta coefficient of Location was reduced (from b=0.190 to b=0.094) but was still statistically significant, with autonomy need fulfillment in the model. Likewise, the beta coefficient of Amenity was reduced (from b=0.243 to b=0.172) but was still statistically significant with autonomy need fulfilment in the model (See Figure 7 – Final Mediation Model below).

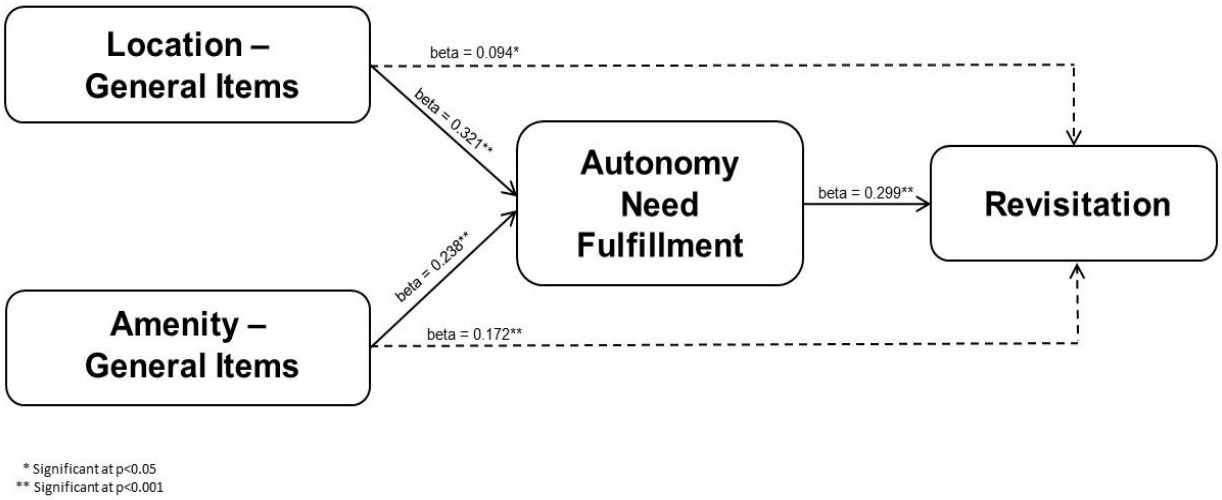



***Figure 7:*** *Final Mediation Model – 65 and Over Men and Women – General Items*

Replicating the results above for Hypothesis 4 using the specific subscales for open space, the results here also support Hypothesis 4, indicating that general elements of Location

and Amenity influence revisitation at least partially through their influence on autonomy need fulfillment. They also have a direct relationship with revisitation suggesting that although autonomy need fulfillment is one mechanism by which these elements influence revisitation, there are potentially other mechanisms through which they influence revisitation.

## Section 3 – Analysis and results for men versus women in the 65 and over age group.

Given prior research has demonstrated that the older adult category is a diverse group and that gender is an important aspect of this diversity, subsequent analysis was conducted on all the variables included in the models to determine if there were gender differences for those 65 and over. The previous analyses above suggested that this might be a promising avenue for additional research. Specifically, means for men versus women were compared for each variable using paired t-tests. Results are below in tables 44 and 45.

| Variables | t-test for Equality of Means – Men versus Women | | | | | | |
|---|---|---|---|---|---|---|---|
| | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | Lower | Upper |
| Autonomy Importance | -3.916 | 511 | .000 | -.194 | .0496 | -.291 | -.097 |
| Competence Importance | -1.013 | 511 | .311 | -.057 | .0564 | -.168 | .054 |
| Relatedness Importance | -5.009 | 511 | .000 | -.365 | .0728 | -.508 | -.222 |
| Autonomy Fulfilment | -1.367 | 511 | .712 | -.137 | .1003 | -.334 | .059 |
| Competence Fulfilment | 1.379 | 511 | .169 | .128 | .0932 | -.055 | .312 |
| Relatedness Fulfilment | -2.343 | 511 | .019 | -.233 | .0996 | -.429 | -.038 |
| Location - Convenience | -3.478 | 511 | .001 | -.236 | .0757 | -.412 | -.115 |
| Location - Community | -3.099 | 511 | .002 | -.253 | .0819 | -.415 | -.093 |
| Location - Safety | -5.518 | 511 | .000 | -.481 | .0872 | -.653 | -.310 |
| Amenity - Infrastructure | -4.394 | 511 | .000 | -.398 | .0906 | -.576 | -.220 |
| Amenity - Exercise | -2.294 | 511 | .022 | -.174 | .0760 | -.324 | -.025 |
| Amenity – Natural Environment | -2.787 | 511 | .006 | -.251 | .0901 | -.428 | -.074 |
| Likelihood of Revisitation | 1.914 | 511 | .056 | .177 | .092 | -.005 | .358 |

***Table 44:*** *T-Tests for Men versus Women 65 and over*

| | | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Autonomy Importance | Male | 279 | 4.0815 | .53378 | .03196 |
| | Female | 234 | 4.2756 | .58814 | .03845 |
| Competence Importance | Male | 279 | 3.8530 | .59441 | .03559 |
| | Female | 234 | 3.9103 | .68394 | .04471 |
| Relatedness Importance | Male | 279 | 3.5197 | .81855 | .04901 |
| | Female | 234 | 3.8846 | .82578 | .05398 |
| Autonomy Fulfillment | Male | 279 | 2.8961 | 1.06887 | .06399 |
| | Female | 234 | 3.0331 | 1.20096 | .07851 |
| Competence Fulfillment | Male | 279 | 2.0708 | 1.07734 | .06450 |
| | Female | 234 | 1.9423 | 1.01933 | .06664 |
| Relatedness Fulfillment | Male | 279 | 2.0797 | 1.09944 | .06582 |
| | Female | 234 | 2.3130 | 1.15068 | .07522 |
| Location Importance -Convenience | Male | 279 | 2.6708 | .78719 | .04713 |
| | Female | 234 | 2.9341 | .92753 | .06063 |
| Location Importance -Community | Male | 279 | 2.3124 | .91771 | .05494 |
| | Female | 234 | 2.5662 | .93149 | .06089 |
| Location Importance -Safety | Male | 279 | 2.9624 | .99433 | .05953 |
| | Female | 234 | 3.4437 | .97197 | .06354 |
| Amenity Importance -Infrastructure | Male | 279 | 3.0208 | 1.02557 | .06140 |
| | Female | 234 | 3.4188 | 1.01744 | .06651 |
| Amenity Importance -Exercise | Male | 279 | 2.2294 | .86067 | .05153 |
| | Female | 234 | 2.4038 | .85425 | .05584 |
| Amenity Importance –Natural Environment | Male | 279 | 2.8753 | .99910 | .05981 |
| | Female | 234 | 3.1265 | 1.03753 | .06783 |
| Likelihood of Revisitation | Male | 279 | 4.55 | .973 | .058 |
| | Female | 234 | 4.37 | 1.117 | .073 |

***Table 45:*** *Mean Scores on all Variables – Men versus Women 65 and over*

Women reported greater importance of autonomy and relatedness needs than men, as well as greater fulfilment of relatedness needs when visiting parks. Additionally, more women than men reported that the elements of open space location and amenity were more important for a satisfying park visit. Given these results, tests of hypotheses were conducted separately for men

65 and over and women 65 and over to ensure the results held for both groups, and examine any potential differences in the pattern of findings.

### i. Investigating potential gender differences in hypothesis 2 - Attributes of Open Space Which Result in Need Fulfilment.

The above analysis was run separately for men and again for women in the 65 and over age group to determine if there were any differences between the genders. Results were similar in each model; the six elements (See tables 46, 47, & 48 below for men and tables 49, 50, & 51 for women) predicted a significant portion of variance in autonomy need fulfillment. In both models, Amenity – Natural Environment was a significant predictor in fulfilling the need for autonomy (For men, $b=0.264$, $t=3.980$, $p<0.001$; for women, $b=0.258$, $t=3.530$, $p<0.001$). Interestingly, Location – Convenience was only a significant predictor for men ($b=0.210$, $t=2.349$, $p<0.05$), whereas Location – Community was only a significant predictor for women ($b=0.214$, $t=2.360$, $p<0.05$). The final result indicates that for women, the two strongest predictors were elements of community and natural environment, while for men, the two strongest predictors were elements of convenience and natural environment.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .426 | .182 | .164 | .97752 |

***Table 46:*** *Regression Model Summary – Autonomy fulfillment of Men only aged 65 and over across all elements of Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 57.704 | 6 | 9.617 | 10.065 | .000 |
| | Residual | 259.907 | 272 | .956 | | |
| | Total | 317.611 | 278 | | | |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 47:*** *ANOVA Autonomy fulfillment of Men only aged 65 and over across all elements of Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | 1.251 | .234 | | 5.356 | .000 | .791 | 1.712 | | |
| | Location Convenience | .285 | .121 | .210 | 2.349 | .020 | .046 | .523 | 2.644 | 8.276 |
| | Location Community | .129 | .107 | .111 | 1.203 | .230 | -.082 | .339 | 2.805 | 10.141 |
| | Location Safety | .093 | .106 | .087 | .881 | .379 | -.115 | .302 | 3.224 | 11.255 |
| | Amenity Exercise | -.126 | .107 | -.101 | -1.178 | .240 | -.336 | .084 | 2.456 | 16.715 |
| | Amenity Natural Environment | .282 | .071 | .264 | 3.980 | .000 | .143 | .422 | 1.459 | 17.272 |
| | Amenity Infrastructure | -.073 | .092 | -.070 | -.796 | .427 | -.253 | .107 | 2.566 | 13.203 |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 48:*** *Regression Coefficients – Autonomy fulfillment of Men only aged 65 and over across all elements of Open Space.*

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .558 | .312 | .294 | 1.00943 |

***Table 49:*** *Regression Model Summary – Autonomy fulfillment of Women only aged 65 and over across all elements of Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 104.756 | 6 | 17.459 | 17.135 | .000 |
| | Residual | 231.300 | 227 | 1.019 | | |
| | Total | 336.056 | 233 | | | |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 50:*** *ANOVA Autonomy fulfillment of Women only aged 65 and over across all elements of Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | .540 | .284 | | 1.899 | .059 | -.020 | 1.100 | | 1.000 |
| | Location Convenience | .180 | .121 | .139 | 1.486 | .139 | -.059 | .419 | 2.892 | 8.681 |
| | Location Community | .275 | .117 | .214 | 2.360 | .019 | .045 | .505 | 2.700 | 10.512 |
| | Location Safety | .202 | .117 | .163 | 1.722 | .086 | -.029 | .432 | 2.964 | 12.223 |
| | Amenity Exercise | -.013 | .112 | -.010 | -.119 | .905 | -.235 | .208 | 2.105 | 16.813 |
| | Amenity Natural Environment | .298 | .085 | .258 | 3.530 | .001 | .132 | .465 | 1.758 | 19.530 |
| | Amenity Infrastructure | -.098 | .099 | -.083 | -.998 | .319 | -.293 | .096 | 2.304 | 14.339 |

a. Dependent Variable: Need for Autonomy Fulfillment

***Table 51:*** *Regression Coefficients – Autonomy fulfillment of Women only aged 65 and over across all elements of Open Space.*

### ii. Investigating potential gender differences in hypothesis 3 - Relationship of Need Fulfillment to Revisitation.

The analysis above was conducted separately for men and for women 65 and over. The results were remarkably the same. Together, fulfillment of the three needs predicted a significant amount of variance in revisitation for both models (for men, $R^2 = .132$, $F=14.45$, $p<.001$; and for women, $R^2 = .222$, $F=22.113$, $p<.001$). Examining the individual beta coefficients for the three needs, only fulfillment of the need for autonomy predicted revisitation for both models (for men,

b=.339, t=5.06, p<.001; and for women, b=.38, t=5.30, p<.001). See tables 52, 53, and 54 for men, and 55, 56, & 57 for women below.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .364[a] | .132 | .123 | .900 |

a. Predictors: (Constant), Relatedness Fulfillment, Autonomy Fulfillment, Competence Fulfillment

***Table 52:*** *Regression Model Summary – Likelihood of Revisitation due to need fulfillment in Men aged 65 and over.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 35.067 | 3 | 11.689 | 14.445 | .000[b] |
| | Residual | 229.808 | 284 | .809 | | |
| | Total | 264.875 | 287 | | | |

a. Dependent Variable: Likelihood of revisitation

b. Predictors: (Constant), Relatedness Fulfillment, Autonomy Fulfillment, Competence Fulfillment

***Table 53:*** *ANOVA – Likelihood of Revisitation due to need fulfillment in Men aged 65 and over.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | 3.557 | .165 | | 21.539 | .000 | 3.232 | 3.882 | | |
| | Autonomy Fulfilment | .305 | .061 | .339 | 5.026 | .000 | .186 | .424 | 1.491 | 5.152 |
| | Competence Fulfilment | -.007 | .062 | -.007 | -.105 | .917 | -.129 | .116 | 1.580 | 5.761 |
| | Relatedness Fulfilment | .062 | .053 | .071 | 1.164 | .245 | -.043 | .167 | 1.205 | 8.397 |

a. Dependent Variable: Likelihood of Revisitation

***Table 54:*** *Regression Coefficients – Likelihood of Revisitation due to need fulfillment in Men aged 65 and over.*

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .471[a] | .222 | .212 | .990 |

a. Predictors: (Constant), Relatedness Fulfillment, Autonomy Fulfillment, Competence Fulfillment

***Table 55:*** *Regression Model Summary – Likelihood of Revisitation due to need fulfillment in Women aged 65 and over.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 65.006 | 3 | 21.669 | 22.113 | .000[b] |
| | Residual | 228.319 | 233 | .980 | | |
| | Total | 293.325 | 236 | | | |

a. Dependent Variable: Likelihood of revisitation

b. Predictors: (Constant), Relatedness Fulfillment, Autonomy Fulfillment, Competence Fulfillment

***Table 56:*** *ANOVA – Likelihood of Revisitation due to need fulfillment in Women aged 65 and over.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Diagnostics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | VIF | CI |
| 1 | (Constant) | 2.953 | .189 | | 15.612 | .000 | 2.581 | 3.326 | | 1.000 |
| | Autonomy Fulfilment | .351 | .066 | .376 | 5.302 | .000 | .221 | .482 | 1.508 | 5.557 |
| | Competence Fulfilment | .096 | .084 | .087 | 1.142 | .254 | -.069 | .261 | 1.747 | 5.911 |
| | Relatedness Fulfilment | .072 | .066 | .075 | 1.101 | .272 | -.057 | .202 | 1.404 | 7.958 |

a. Dependent Variable: Likelihood of Revisitation

***Table 57:*** *Regression Coefficients – Likelihood of Revisitation due to need fulfillment in Women aged 65 and over.*

### iii. Tests of Mediation for Men 65 and over

To investigate the mediation effects for men in the 65 and over age group, a second mediated regression analysis was conducted. Included were the two specific elements of open

space (location - convenience and amenities - natural environment) that had been shown in the previous analysis to have implications for autonomy need fulfillment. In this analysis the first step is to show that the Independent Variables (IV) are related to the mediator. This is shown in table 60 below for the elements of Convenience ($b=0.159$, $p<0.001$) and Natural Environment ($b=0.253$, $p<0.001$). These elements were both significant predictors of autonomy need fulfilment.

The next step in mediation analysis is to show that the IV's are significant predictors of the dependent variable (DV) Revisitation for men. The mediation analysis output is shown in tables 58, 59, and 60 below. The two elements of open space, when combined, predicted significant variance in revisitation ($R^2=0.120$, $F=18.811$, $p<0.001$). Examining the beta coefficient for each element individually indicated that both elements, Convenience ($b=0.159$, $t=2.611$, $p<0.01$) and Natural Environment ($b=0.253$, $t=4.143$, $p<0.001$) predicted revisitation for men.

The third step in mediation analysis is to confirm that the mediator (autonomy need fulfilment) is a significant predictor of the DV (Revisitation). As per Table 60 – Mediation Regression Coefficients, this step was confirmed ($b=0.259$, $t=4.325$, $p<0.001$).

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .346[a] | .120 | .114 | .916 | .120 | 18.811 | 2 | 276 | .000 |
| 2 | .420[b] | .176 | .167 | .888 | .056 | 18.705 | 1 | 275 | .000 |

a. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience.
b. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience, Autonomy Fulfillment.

***Table 58:*** *Mediation Regression Analysis Model Summary (Men aged 65 and over) – Mediation effects on visitation to Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 31.561 | 2 | 15.781 | 18.811 | .000[b] |
| | Residual | 231.535 | 276 | .839 | | |
| | Total | 263.097 | 278 | | | |
| 2 | Regression | 46.307 | 3 | 15.436 | 19.580 | .000[c] |
| | Residual | 216.790 | 275 | .788 | | |
| | Total | 263.097 | 278 | | | |

a. Dependent Variable: Likelihood of Revisitation
b. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience.
c. Predictors: (Constant), Amenity-Natural Environment, Location-Convenience, Autonomy Fulfillment

***Table 59:*** *Mediation Regression Analysis ANOVA Output – Men aged 65 and over – Mediation effects on visitation to Open Space.*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part | VIF | CI |
| 1 | (Constant) | 3.314 | .216 | | 15.345 | .000 | 2.889 | 3.740 | | | | | 1.000 |
| | Location-Convenience | .197 | .075 | .159 | 2.611 | .010 | .048 | .345 | .255 | .155 | .147 | 1.169 | 6.813 |
| | Amenity-Natural Environment | .246 | .059 | .253 | 4.143 | .000 | .129 | .363 | .313 | .242 | .234 | 1.169 | 8.459 |
| 2 | (Constant) | 3.019 | .220 | | 13.704 | .000 | 2.585 | 3.452 | | | | | 1.000 |
| | Location-Convenience | .117 | .075 | .095 | 1.552 | .122 | -.031 | .266 | .255 | .093 | .085 | 1.243 | 7.023 |
| | Amenity-Natural Environment | .186 | .059 | .191 | 3.134 | .002 | .069 | .303 | .313 | .186 | .172 | 1.237 | 7.896 |
| | Autonomy Fulfillment | .236 | .055 | .259 | 4.325 | .000 | .128 | .343 | .355 | .252 | .237 | 1.198 | 9.740 |

a. Dependent Variable: Likelihood of Revisitation

***Table 60:*** *Mediation Regression Coefficients – Men aged 65 and over – Mediation effects on visitation to Open Space.*

The final step in mediation analysis is to determine if the strength of relationship between the IV's (elements of Open Space) and the DV (Revisitation) is reduced (indicating partial mediation) or becomes non-significant (full mediation) when the mediator is in the model. In contrast to the model for the overall 65 and over sample, results for men indicate full mediation for Convenience because it is no longer significant when autonomy fulfilment is in the model (b=0.095, t=1.552, n.s.). Like the overall sample, partial mediation was evidenced for Natural Environment, given the beta coefficient of Natural Environment was reduced (from b=0.253 to b=0.191) but was still statistically significant with autonomy need fulfilment in the model (See Figure 8 – Final Mediation Model for Men below).

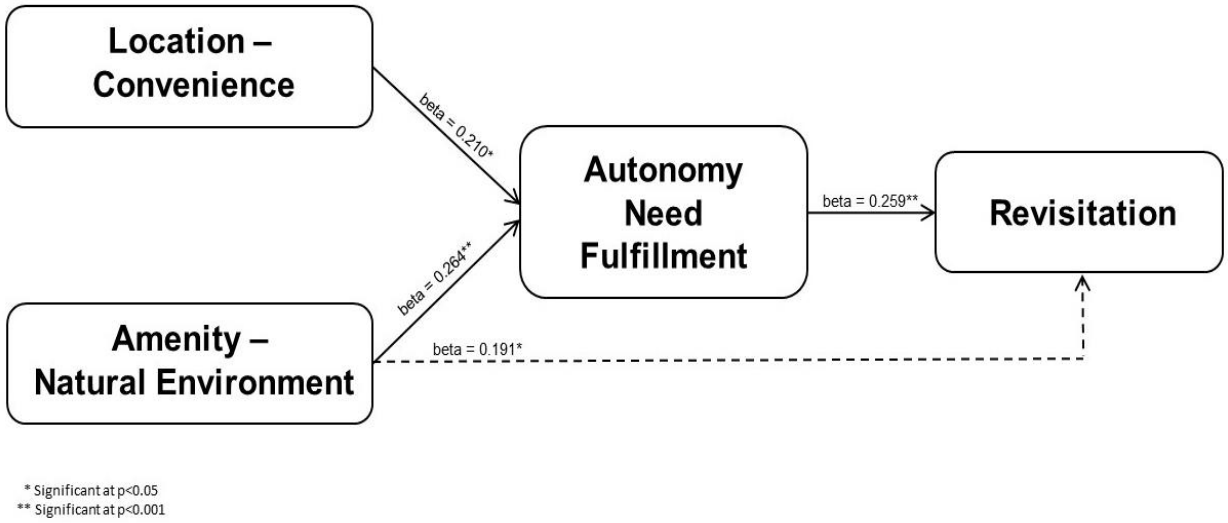



***Figure 8:*** *Final Mediation Model – Men aged 65 and over*

### iv. Tests of Mediation for Women 65 and over

To investigate the mediation effects for women in the 65 and over age group, a third mediated regression analysis was conducted. Included were the two specific elements of open space (location - community and amenities - natural environment) that had been shown in the

previous analysis to have implications for autonomy need fulfillment. In this analysis the first step is to show that the Independent Variables (IV) are related to the mediator. This is shown in table 63 below for the elements of Community ($b=0.214$, $p<0.01$) and Natural Environment ($b=0.264$, $p<0.001$). These elements were both significant predictors of autonomy need fulfilment.

The next step in mediation analysis is to show that the IV's are significant predictors of the dependent variable (DV) Revisitation. The mediation analysis output is shown in tables 61, 62, and 63 below. The two elements of open space, when combined, predicted significant variance in revisitation ($R^2=0.162$, $F=22.393$, $p<0.001$). Examining the beta coefficient for each element individually indicated that both elements, Community ($b=0.214$, $t=3.219$, $p<0.001$) and Natural Environment ($b=0.264$, $t=3.977$, $p<0.001$), predicted revisitation.

The third step in mediation analysis is to confirm that the mediator (autonomy need fulfilment) is a significant predictor of the DV (Revisitation). As per Table 63 – Mediation Regression Coefficients, this step was confirmed ($b=0.349$, $t=5.167$, $p<0.001$).

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .403[a] | .162 | .155 | 1.027 | .162 | 22.393 | 2 | 231 | .000 |
| 2 | .500[b] | .250 | .240 | .974 | .087 | 26.699 | 1 | 230 | .000 |

a. Predictors: (Constant), Amenity-Natural Environment, Location-Community.
b. Predictors: (Constant), Amenity-Natural Environment, Location-Community, Autonomy Fulfillment.

***Table 61:*** *Mediation Regression Analysis Model Summary (Women aged 65 and over) – Mediation effects on visitation to Open Space.*

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 47.201 | 2 | 23.601 | 22.393 | .000[b] |
| | Residual | 243.453 | 231 | 1.054 | | |
| | Total | 290.654 | 233 | | | |
| 2 | Regression | 72.522 | 3 | 24.174 | 25.489 | .000[c] |
| | Residual | 218.132 | 230 | .948 | | |
| | Total | 290.654 | 233 | | | |

a. Dependent Variable: Likelihood of Revisitation
b. Predictors: (Constant), Amenity-Natural Environment, Location-Community
c. Predictors: (Constant), Amenity-Natural Environment, Location-Community, Autonomy Fulfillment

***Table 62:*** *Mediation Regression Analysis ANOVA Output – Women aged 65 and over – Mediation effects on visitation to Open Space.*

**Coefficients[a]**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part | VIF | CI |
| 1 (Constant) | 2.827 | .240 | | 11.761 | .000 | 2.353 | 3.301 | | | | | 1.000 |
| Location-Community | .256 | .080 | .214 | 3.219 | .001 | .099 | .413 | .324 | .207 | .194 | 1.213 | 7.557 |
| Amenity-Natural Environment | .284 | .071 | .264 | 3.977 | .000 | .143 | .425 | .353 | .253 | .239 | 1.213 | 6.671 |
| 2 (Constant) | 2.533 | .235 | | 10.778 | .000 | 2.070 | 2.996 | | | | | 1.000 |
| Location-Community | .090 | .082 | .075 | 1.091 | .276 | -.072 | .251 | .324 | .072 | .062 | 1.435 | 7.923 |
| Amenity-Natural Environment | .200 | .070 | .186 | 2.873 | .004 | .063 | .337 | .353 | .186 | .164 | 1.283 | 6.979 |
| Autonomy Fulfillment | .324 | .063 | .349 | 5.167 | .000 | .201 | .448 | .458 | .323 | .295 | 1.395 | 8.686 |

a. Dependent Variable: Likelihood of Revisitation

***Table 63:*** *Mediation Regression Coefficients – Women Aged 65 and over – Mediation effects on visitation to Open Space.*

The final step in mediation analysis is to determine if the strength of relationship between the IV's (elements of Open Space) and the DV (Revisitation) is reduced (indicating partial mediation) or becomes non-significant (full mediation) when the mediator is in the model. In contrast to the model for the overall 65 and over sample, results for women indicate full mediation for Community because it is no longer significant when autonomy fulfilment is in the model (b=0.075, t=1.091, n.s.). Like the overall sample, partial mediation was evidenced for Natural Environment, given the beta coefficient of Natural Environment was reduced (from b=0.264 to b=0.186) but was still statistically significant with autonomy need fulfilment in the model (See Figure 9 – Final Mediation Model for Women below).

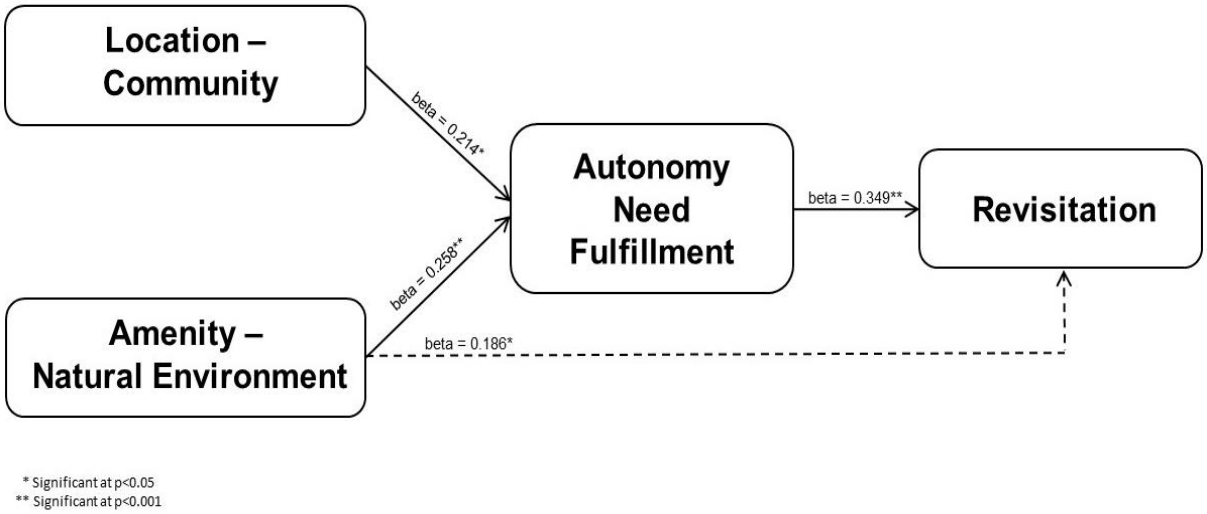



***Figure 9:*** *Final Mediation Model – Women aged 65 and over*

To summarize the mediation analyses across the two genders, they each provide partial support for Hypothesis 4, which predicted partial mediation rather than full mediation. That is, for men, the analysis demonstrated full mediation for the Convenience element and partial mediation for Natural Environment. For women, full mediation was demonstrated for the Community element and partial mediation for elements of the Natural Environment. This

suggests that the relationships between convenience and revisitation (for men) and the relationships between community and revisitation (for women) operate entirely through fulfilment of the autonomy needs. Interestingly, this is an even stronger relationship than that proposed in the hypothesis, highlighting how important it is to consider fulfilment of the need for autonomy in understanding revisitation.

### v. Investigating Moderation Effect Across Genders (Hypothesis 5).

The analyses above were repeated for men only and for women only. In each case, the pattern of results obtained was similar to the pattern of results overall in the 65 and over age group. However, likely due to the smaller sample size, the interaction effect did not reach significance for either males or females.

### vi. Summary of Quantitative Findings

In summary, the results support the research model in Figure 1 (See Table 64 below). Findings indicated that respondents were motivated to revisit an open space that fulfills their needs, and that fulfillment of these needs rests on whether specific attributes of the space contribute to specific needs that they deem important. Older adults aged 65 and over were more likely to revisit an open space that fulfilled their need for autonomy, and fulfilment of autonomy was dependent upon their favorable evaluation of the convenience of the location, location in relation to the community, and the amenities in the natural environment. This relationship was amplified when the need for autonomy was particularly important. Findings for men and women were similar, however, for men the convenience and natural environment attributes were stronger

predictors of autonomy need fulfillment than community, and for women the community and natural environment attributes were stronger predictors of autonomy need fulfillment.

| | Age 65 and Over – Specific Open Space Scales | | Age 65 and Over – General Open Space Scales | | Gender Differences | |
|---|---|---|---|---|---|---|
| **Hypothesis** | **Supported?** | **Summary Statement** | **Supported?** | **Summary Statement** | **Supported?** | **Summary Statement** |
| ***Hypothesis 1*** *– Age influences the importance placed on autonomy, competence, and relatedness needs, with older adults placing more importance on autonomy, followed by competence and relatedness. Importance of needs may be a result of an interaction among demographic characteristics, including age, gender, and culture.* | Yes | The need for autonomy was the only need that varied based on age, even after entering covariates for gender and culture. | Yes | The need for autonomy was the only need that varied based on age, even after entering covariates for gender and culture. | Yes (Men)<br>Yes (Women) | The need for autonomy varied based on gender for adults 65 and over, but for both genders, autonomy was the most important need, relative to the other needs. Need for autonomy was more important for women than for men in the 65 and over age group. |
| ***Hypothesis 2*** *- Favorable evaluation of open space location and amenities is related to fulfillment of autonomy, competence and relatedness needs.* | Yes | Elements of park location and amenities are related to fulfilment of the need for autonomy.<br>The convenience of the location, the community surrounding the location, and the natural environment amenities, were the strongest predictors of fulfilment of the need for autonomy among older adults over age 65. | Yes | Elements of park location and amenities are related to fulfilment of the need for autonomy. | Yes (Men)<br>Yes (Women) | In the 65 and over age group, the two strongest predictors were Convenience and Natural Environment for men. For women, the two strongest predictors were Community and Natural Environment. |

| | Age 65 and Over – Specific Scales | | Age 65 and Over – General Scales | | Gender Differences | |
|---|---|---|---|---|---|---|
| **Hypothesis** | **Supported?** | **Summary Statement** | **Supported?** | **Summary Statement** | **Supported?** | **Summary Statement** |
| ***Hypothesis 3*** *– Fulfillment of psychological needs during open space visitation will be related to the likelihood of revisiting the open space in the future. In particular, among older adults, the strongest relationship will occur between autonomy need fulfillment and revisitation.* | Yes | When autonomy needs are fulfilled in adults aged 65 and over, revisitation to open space is likely. In addition, the analysis supports the hypothesis that autonomy need fulfillment is more strongly related to open space revisitation than needs relating to competence or relatedness. | Yes | When autonomy needs are fulfilled in adults aged 65 and over, revisitation to open space is likely. In addition, the analysis supports the hypothesis that autonomy need fulfillment is more strongly related to open space revisitation than needs relating to competence or relatedness. | Yes (Men)<br>Yes (Women) | When autonomy needs are fulfilled in adults aged 65 and over, revisitation to open space is likely. In addition, the analysis supports the hypothesis that autonomy need fulfillment is more strongly related to open space revisitation than needs relating to competence or relatedness. |
| ***Hypothesis 4*** *– The relationship between open space location and amenities and the likelihood of revisitation will be partially mediated by fulfillment of needs for autonomy, competence, and relatedness during a previous visit. For older adults, the strongest relationships will occur when needs of autonomy are fulfilled.* | Yes | Elements of Convenience and Natural Environment influence revisitation at least partially through their influence on autonomy need fulfillment. However, they also have a direct relationship with revisitation suggesting that although autonomy need fulfillment is one mechanism by which these elements influence revisitation, there are potentially other mechanisms through which they influence revisitation. | Yes | Elements of Location and Amenity influence revisitation at least partially through their influence on autonomy need fulfillment. However, they also have a direct relationship with revisitation suggesting that although autonomy need fulfillment is one mechanism by which these elements influence revisitation, there are potentially other mechanisms through which they influence revisitation. | Partial (Men)<br>Partial (Women) | For men, the analysis demonstrated full mediation for the Convenience element and partial mediation for Natural Environment. For women, full mediation was demonstrated for the Community element and partial mediation for elements of the Natural Environment. This suggests that the relationships between convenience and revisitation (for men) and the relationships between community and revisitation (for women) operate entirely through fulfilment of the autonomy needs. |

| | Age 65 and Over – Specific Scales | | Age 65 and Over – General Scales | | Gender Differences | |
|---|---|---|---|---|---|---|
| **Hypothesis** | **Supported?** | **Summary Statement** | **Supported?** | **Summary Statement** | **Supported?** | **Summary Statement** |
| ***Hypothesis 5*** *- The relationship between need fulfillment and revisitation is stronger, the more important the need to the individual (i.e., need importance moderates the relationship between need fulfillment and revisitation).* | Yes | The relationship between autonomy need fulfillment and revisitation is stronger for those with a high need for autonomy than for those with a low need for autonomy. | Yes | The relationship between autonomy need fulfillment and revisitation is stronger for those with a high need for autonomy than for those with a low need for autonomy. | No (Men)<br>No (Women) | Likely due to the smaller sample size, the interaction effect did not reach significance for either males or females. |

***Table 64:*** *Hypothesis Support Summary*

# CHAPTER 6: INTERVIEW ANALYSIS AND RESULTS

This chapter presents the analysis and results for the qualitative component of the mixed-methods design. Specifically, I complemented the breadth afforded by the large-scale survey data collection with the depth afforded by interviews to better understand open space access and visitation among older adults. The goals for the qualitative analysis of the primary interview data were to explore answers to the three research questions ("In which ways are older adults motivated to engage in open space?" "What are the factors that promote open space access among older adults?" and "How can open space provision, design, and management processes cater to the needs and motivations of older adults to increase visitation?"). I also wished to triangulate the answers to the previous interview questions with those provided by the quantitative results of the survey, discussed in Chapter 5. I also employed the qualitative analysis to gain insights that could guide theory development, interpret the quantitative results, and better understand the implications for practice (Creswell & Plano Clark, 2011).

I transcribed interviews verbatim, resulting in 359 pages of textual data. I analysed these data using NVIVO, proceeding from open coding to axial coding and selective coding (Saldaña, 2013). Specifically, I began with open coding, which Strauss and Corbin (1990, p. 61) describe as "the process of breaking down, examining, comparing, conceptualizing, and categorizing data." Second, I conducted axial coding as an intermediate step, defined as "a set of procedures whereby data are put back together in new ways after open coding, by making connections between categories" (Strauss & Corbin, 1990, p. 96). In this step, I aggregated raw codes and looked for relationships among them. As a third step, I engaged in selective coding to identify broader themes and dimensions. This step involved understanding and integrating smaller individual categories as pieces of a larger core category to produce an organizing scheme

(Strauss & Corbin, 1990) to enable further systematic thinking about the phenomenon under study.

Throughout this three-step process, I moved iteratively back and forth between theory and data by comparing insights from the data with the literature and vice versa so that each informed the other, as is common in qualitative analysis. At each step, I discussed results with academic colleagues to enable joint interpretation and ensure analytical trustworthiness (Lincoln & Guba, 1985; Corley & Gioia, 2004). I coded until I reached "theoretical saturation" in which no new codes or insights emerged from the data (Glaser & Strauss, 1967). This process allowed for insights into the proposed model and guided interpretation of the implications for practice.

This process resulted in 43 first order codes as outlined in Tables 66, 67, 68, 69, and 70 at the end of this chapter. For example, the code "Cognitive Incapacity" was assigned to excerpts which addressed the self-reported changes that occur in older adults' experiences, as well as their perceptions of themselves. The code "Change in Open Space Use" captured excerpts which pertained to the changes experienced by older adults in their open space use trends compared to the trends of use from their younger years As a final example the code "Walking Amenities" was assigned to excerpts that related to preferences and opinions of older adults regarding walking path provision in open space. All excerpts were accompanied by basic demographic information of the interviewee. As Australian census data is based on country of birth instead of ethnicity or race, the country of birth of each interviewee was included, along with gender and age. These findings corroborated quantitative analysis that showed there is little significant difference between older adults born in Australia and those born in other countries.

These 43 first order codes were collapsed into 15 second order codes. For example, the codes “Frequency of social interaction”, “Loneliness”, “Change in life’s routines”, “Daily activities and health” and “Available time” were collapse into the second order code “Post-retirement perspectives”. As another example, the codes “Visual appeal”, “Visual engagement”, and “Concealed locations” were aggregated into the second order code “Visual Impacts”.

Finally, these second order codes were aggregated into five categories pertaining to: 1) insights into the older adult life stage; 2) psychological experience of park visits as perceived by older adults; 3) planning related elements of the park that are pertinent to enjoyment of the park visit; 4) policy related elements of open space management; and 5) design related elements leading to satisfaction with the park visit (See Table 65 below for built environment category explanations). I discuss each of these next.

### i. Life Stage Insights

The first category of codes pertained to insights provided by interviewees that evidenced the opportunities and challenges faced by older adults in their daily life. Excerpts clearly indicated different experiences by older adults as compared with their lives as younger adults (under the age of 65). These data provided the insight required to comprehend the excerpts revealed in other categories discussed below. Second order codes in this main category revealed post-retirement perspectives on life, experiences and fears of age discrimination, and also opinions on aspects of the contemporary built environment which interviewees now find themselves interacting with.

A few interviewees commented on their frequent social interactions, while others described a profound loneliness (See 'Post-Retirement Perspectives' excerpts on page 136). In most cases, comments relating to loneliness were expressed by women.

| Major Category | Relevant First Order Codes | Category Objectives | Discipline of Influence |
|---|---|---|---|
| Planning | • Access via Organized Transportation<br>• Available Parking<br>• Pedestrian Access to Park<br>• Adjacent Community Composition<br>• Proximity to Residence<br>• Safety | Advise location and adjacencies of land-use and community | • Regional Planning<br>• Urban Planning<br>• Urban Design |
| Policy | • Shared-Use Paths<br>• Dogs<br>• Access to Information<br>• Community Consultation<br>• Council Involvement<br>• Programs in Parks<br>• Quantity of Amenities | Advise use and public involvement | • Public Sector – local, state, and federal |
| Design | • Natural Landscapes<br>• Vegetation<br>• Water<br>• Wildlife<br>• Park Lighting<br>• Playgrounds and Skate Parks<br>• Seating<br>• Service and Eating Opportunities<br>• Shade<br>• Walking Amenities<br>• Sporting Amenities<br>• Visual Appeal<br>• Visual Engagement<br>• Concealed Locations | Advise built form | • Landscape Architecture<br>• Urban Design<br>• Architecture |

***Table 65:*** *Explanation of Built Environment Categories*

Of particular interest were the insights provided by about 60% of interviewees about changes individuals encounter once they reach retirement. Numerous respondents discussed changes to daily activities, and the relationship of these activities to perceptions of time, as an increasingly important emphasis in their lives (See 'Post-Retirement Perspectives' excerpt this page below). Some interviewees spoke of their experiences as working and producing members of society, how these experiences have changed since reaching retirement age, and how this relates to perceptions held by younger individuals of their cognitive capacities in the workplace (See 'Age Discrimination' excerpts on page 137). Finally, several comments pertained to older adult interviewees coming to grips with the changing nature of the built environment that they now find themselves in, reflecting on the changes they've experienced during their lives (See 'Perspectives on the Built Environment' on page 138).

**Post-Retirement Perspectives.** One second order category within this theme pertained to changes in social relationships that occur after retirement. For example, approximately 40% of the interviewees mentioned the busy social schedule that they now keep. One particularly humorous comment related to the difficulties extended family members were having contacting their retired mother. She commented:

> *"Well, I've been told (by my daughters)… "You've got to get a life". Now I've got a life, and they ring up and say "Hello, Machine, how are you? If Mum gets time will she give me a ring back?" I said "Well, you told me to get a life" and now I'm never home."* Female, Australia, age 74.

In contrast, approximately 25% of other interviewees expressed their loneliness, particularly since the passing of life partners:

*"As you can appreciate when you live in a retirement village, weekends are very lonely...So, you know, if you've got something to go to on the weekend it just makes it easier."* Female, Australia, age 66.

And…

*"I talk to anybody who'll listen. I suppose it's something that grows on you a bit when you live alone."* Female, Australia, age 89.

Possibly the most enlightening comment made on the subject of post-retirement life related to the change in timing and priorities. One female interviewee eloquently summed up the experience:

*"We've both [interviewee and her husband] worked in jobs where you've got people around you, so in many ways your social needs are met there. Now, when you stop working, to me there are a few things that suddenly flip over. It doesn't change that you want access to the outdoors but you have got seven days a week to do it… but there's probably a bit of need for the social interaction to be happening in some way or other. [Pre-retirement] I'm just thinking "Can we please have nothing organised this weekend"… now we're looking for some form of structure and organised activity and all of those things that I've been appalled at in the past… there's got to be social dimensions for older people or people once they stop working and it matters… I think it's during the week that it seems to matter more for older folks and then the weekends are actually free for their families..."* Female, New Zealand, age 65.

**Age discrimination.** The next second-order category captured another post-retirement shift that occurs for older adults. This shift pertains to the perceptions that younger adults have of their cognitive capacities. Respondents indicated that in many instances, younger colleagues and friends have a stereotype, which suggests declining cognitive capacity among older adults. Yet

for all of this set of interviewees, this could not be further from the truth, as there was no medical (nor anecdotal) evidence of any such decline. Interviewees expressed frustration at this discrimination, and suggested that it probably affects the degree to which the older adult's needs, perspectives, and experiences are taken seriously. One male interviewee, who was still working as an architect, mused over the changes to his life after the age of 65 by stating:

> *"Yeah, well, I don't talk about my age deliberately because people then assume that you're retired or beginning to lose the plot, all those sorts of things which I don't want people to think."* Male, Australia, age 71.

He further noted…

> *"I'm still working. I'm enjoying working and I don't like people to think, "Oh, well, we won't give the next job to him. I'll try somebody younger"."* Male, Australia, age 71.

**Perspectives on the built environment.** Many interviewees (approximately 50%) expressed very eloquent views regarding what they saw as a negative trend in planning and design. In fact, a few of the interviewees who had volunteered for this research, did so because they were aware that this was being conducted for an Urban Planning Ph.D. and were interested in the subject from that perspective. These individuals voluntarily revealed they were retired architects, urban planners, or surveyors themselves, or were married to partners who were involved in similar professions, and so had some relatively strong thoughts on the state of the built environment through the eyes of an older adult. One male interviewee, who had previously revealed information about his pre-retirement profession in urban planning and architecture and the extent of work he had conducted in community engagement and participation, stated clearly his beliefs on the current state of the built environment in relation to suitability for various social groups:

> *"Yeah, well, design's my business or was. Still is, really. I look at everything with a designer's eye and most of the time I'm distraught because the quality of design has gone to hell."* Male, Australia, age 77.

Another interviewee expressed concern over the professional qualifications found in industry today by noting:

> *"Heritage has been the bane of architects' lives. Although it started out with the right idea, it's been taken over by greenies and others who know nothing about architecture or the quality of buildings and anything that has some historical background is now heritage and I could anticipate that this will happen with parks and landscape....and these won't be people that really understand what it's all about but they're pushing that barrow [pursuing that outcome]."* Female, Australia, age 76.

While these excerpts indicated a frustration in the way the built environment is being provided and managed, other interviewees expressed frustration in ways that the built environment and, in particular, open space is being used by the younger generations, illustrating a clear disparity in the experiences of older adults as compared to younger adults. One interviewee lamented:

> *"I just feel sorry that they're missing out [while wearing headphones in the park]. I mean you don't need music because there's birds and they are missing probably about sixty per cent of what I'm receiving. Yeah, but that's just modern people."* Male, Australia, age 72.

Another summarized the disparity simply:

> *"But the older you get, I suppose you're looking more for passive parks than active parks."* Male, Australia, age 76.

In summary, the excerpts within this theme indicate important insights with regard to post-retirement life, age discrimination, and views of the built environment that must be taken into consideration when planning and designing open space if it is to attract visitors in the older adult age group. Of particular note are the comments relating to the built environment. A summary of the excerpts notes importance to older adults of inclusion of nature in parks as opposed to manicured elements, ample shade, appropriate seating, locations convenient to retirement villages, smooth and relatively flat walking paths, clear views within the park that follow 'Crime prevention through environmental design' (CPTED) principles for safety, convenient parking with older adult reserved spaces near the entrance (similar to handicapped spaces), passive recreational space, and appropriate limitations on shared-use paths and dogs off the leash.

### ii. Psychological Experience of Park Visits.

The second category of codes pertained to the inner experience of visiting the park, essentially what goes on inside respondents' heads during their park visit, which I refer to as the psychological experience. Interviewees discussed their motivations for going to parks, including reasons for visiting, expectations, and needs met by a park visit. Corroborating the focus on the needs specified in self-determination theory, interviewees referred to an appreciation for certain elements of park and open space interaction which fulfil their needs for autonomy, competence, and relatedness. Some interviewees made comments relating to the fulfilment of these needs, while others commented specifically on their dissatisfaction with elements of parks and open space which revealed a lack of fulfilment of autonomy, competence, and relatedness needs.

**Need for Autonomy.** The results of the quantitative analysis revealed revisitation was more likely in older adults aged 65 and over when their needs for autonomy were fulfilled by locational and amenity elements of parks and open space. Similarly, qualitative results indicated approximately 75% of interviewee comments that pertained to autonomy need fulfilment in open space visitation by older adults aged 65 and over compared to needs for competence (approximately 50% of interviewee comments) and relatedness (approximately 35% of interviewee comments). For example, first order codes relating to autonomy fulfilment were assigned to excerpts such as:

> *"…but I find walking is enough. In fact, the doctor said "Are you doing any exercise?" I said "Oh, come off it. I haven't got time to put more exercise in". I said "I walk for an hour of a morning and if it's right round the lake it's an hour and a half. I go to carpet bowls in the afternoon". I said "I swim sometimes when it's hot".* Female, Australia, age 74.

This excerpt illustrates the individual's perception that her activities are self-initiated and compatible with her own self-image, adhering to the definition of autonomy given earlier in Chapter 3 (page 46). This ability and desire to undertake activities of interest and an understanding that there are alternative activities that one can engage in (should the first choice not be available or the ideal conditions for engagement are not present) indicates that visiting a park enables autonomy need fulfilment, and this was important to the interviewee.

Interviewees also frequently commented on park and open space experiences which thwarted the fulfilment of their need for autonomy, such as comments relating to limitations placed on basic open space amenities, such as trees, shade, or seating and the resulting negative effect on the individual's ability to engage in compatible, self-initiated activity. Of all interviewees, approximately 80% communicated negative experiences (there were also a similar

percentage of interviewees who commented on positive experiences) One example of a negative experience was articulated as:

> *"But there's too many people building parks now and I suppose they'll put – but no trees, no shade, not thinking of people who might just want to go and sit in a park."* Female, Australia, age 74.

These reflections were expressed by many interviewees and illustrate the large negative impact when simple but important elements are overlooked during open space design and development. Another excerpt of particular note relates to an interviewee's thoughts on local park seating and its appropriateness to older adults:

> *There's a seat there which is quite comfortable for people to walk down to, straight across (gestured across the street), and I don't know how but it's gone lower and lower. And it'd be all right for kids but I tell you, I sit down, I have a job to get out of it, the bench seat has gone so low…and I have said to the – not long after we came in here, I phoned the manager of the parks area there and told him about it. He says, "Oh, yeah, we'll have a look at it. We can't do anything this year" – it was about November, I think – "can't do anything this year", he said. "We'll have a look at it in the budget for next year".* Male, England, age 86.

The interviewee went on further throughout the interview to describe how difficult it was for him to get in and out of the park bench and how it stopped him from using the park on his own, due to his needs for periodic resting while walking. Yet his inability to use the benches without assistance from others presented a clear circumstance where the interviewee's needs for autonomy were not met; in fact, the circumstances prohibited his engagement with open space completely.

**Need for Competence.** The quantitative results described in Chapter 5 showed that the fulfilment of needs relating to competence, defined as experiences that make individuals feel they can generate desired effects and outcomes by themselves, are less important to older adults than those relating to autonomy. Yet, the qualitative interview data also illustrated the importance of fulfilling the need for competence. Following from the example given above, the interviewee mentioned feeling as though he was not physically competent enough to manage the successful use of the park bench seating. Additional interview excerpts from the data revealed that park experiences resulted in expressions of determination in older adults when challenged with a physical activity that was difficult. One interview noted:

> *"And we went into the Botanical Gardens and I was battling to walk, but I thought "I'm going to do it, I'm going to do it".* Female, South Africa, age 72.

These illustrations of determination, however, can only serve the individual to a limited extent, particularly when the physical limitation is more severe. For example, one interviewee commented:

> *"I used to go with a neighbour for a swim every morning but then I did have a broken leg back in the 1990. In one year I had a broken leg and a broken pelvis - I just had a thyroid problem – and I didn't get down to swim much after that."* Female, Australia, age 89.

**Need for Relatedness.** The need for relatedness in older adults, defined as when an individual feels close and connected to significant others in their life, was indicated in the quantitative results presented in Chapter 5 as noteworthy but less important than those relating to autonomy. Approximately 45% of older adult interviewees mentioned that they engage in social

interactions when using open space. In talking about her visits to the park, one interviewee light-heartedly remarked:

> *"I'm a fairly sociable person, I think…I talk to anybody who'll listen. I suppose it's something that grows on you a bit when you live alone."* Female, Australia, age 89.

When considering the impacts of relatedness needs and their fulfilment in open space, one interviewee summarized her perceptions this way:

> *"But in the park - as I said, the people so far around the lake here and it's not all from the village, they're from all kinds of walks (of life) and they'll always be polite and say "Good morning" or "How are you?" type of thing…It makes you want to be there more often."* Female, Australia, age 74.

It becomes clear from comments such as these, that even though it may be less important than autonomy, the need for relatedness and the provision of social opportunity in open space, still figures into the decision to go to the park among older adults. Amenities such as convenient seating arrangements and easy access/use of walking paths will aid in such experiences for those older adults searching for feelings of closeness and connection to others, particularly those living by themselves. These planning and design themes will be discussed further in the following pages.

### iii. Planning Related Elements.

Interviewees expressed many ideas and thoughts related to aspects of open space within the planning realm. These included safety and community, but the most common pertained to the location of parks within the community. These responses linked to similar concepts covered in

the quantitative survey pertaining to convenience (the ease with which older adults can access the open space), safety (concerns over personal safety while travelling to the open space location), and community (elements of the community surrounding the open space location). Respondents discussed both positive and negative experiences prior to their arrival at the open space location and influences which may have aided their decision to visit the park.

**Location convenience.** In relation to convenience, interviewees mentioned their experiences with transportation to the park. Most made comments about driving themselves to open space locations (approximately 80% of interviewees), while others made comments about privately organized transportation such as shuttle buses provided by their retirement villages (approximately 15% of interviewees). Others (approximately 10% of interviewees) mentioned being driven to park locations by family members. Interestingly, there were no comments made by interviewees relating to experiences with public transportation, such as bus or train transit. One interviewee summed up similar experiences noted by other interviewees, by saying that:

> *"Even the council sometimes will have these bus trips but they're older buses they're using. They're not like in the city. Yeah. That is a big thing, yeah, with that, with people clambering up and down the steps...but some people don't go on the outings anymore on some of these tour buses because the seats, they don't go down; they can't get up those steps. So that's another thing that stops people."* Female, Australia, age 81.

These concerns and limitations, in many cases, render autonomy needs unfulfilled, frustrating users and, as indicated, leading to non-use of open space (See Figures 10 and 11 below). These respondents would rather not go to the open space than have to cope with frustrations and/or physical inconveniences. Issues relating to transit and accessibility have been addressed in previous research, most recently in a report published by the Mineta Transportation

Institute (Dipetrillo et al., 2016) entitled, "Improving Pathways to Transit for Persons with Disabilities." These disabilities are found in all ages of patrons, including in older adults aged 65 and over. The above interview excerpt clearly indicates a need for appropriate infrastructure to be implemented to cater to the specific physical requirements of the older adult ridership; a consideration for both policy and funding sources.

Interviewees also spoke of experiences relating to convenience when using a private vehicle to access open space locations, corroborating evidence from the quantitative results that indicated that convenience was a significant predictor of autonomy need fulfilment (see Chapter 5) and, therefore, important to consider. Many interviewees noted that parking was a big factor with regard to fulfilling autonomy needs. One interviewee made an astute observation, noting:

> *"Parking, if there's a lot of people around, parking is the thing. Tell you what is very good that some Shires (councils) do and they've got it over here at the library now, seniors' parking, if maybe you haven't got ACROD (handicapped) sticker, but seniors' parking close to the entrance…because a lot of people…can't walk a long way."* Female, Australia, age 81.

**Safety.** Also corroborating the quantitative analysis, approximately 50% of interviewees, both men and women, mentioned safety as a key predictor of autonomy need non-fulfilment. Safety in this case was described in relation to crime or the actions of troublemakers and was clearly distinguished from badly maintained amenities such as broken walkways or seating. Interview data also revealed limited concern over safety issues in elements relating to location as most interviewees deemed parks to be safe enough. For example, when asked if she had any concerns over her own personal safety while visiting parks, one female interviewee simply commented:

*"No. Funny enough, that's what my daughter says: "You should take the phone with you, Mum" but I don't feel…I haven't come to that yet."* Female, Australia, age 74.

***Figure 10:*** *Standard shuttle bus with pedestrian steps not catering to the older adult.*

[Untitled image of a shuttle bus in use], Retrieved November 26, 2016

***Figure 11:*** *Lift gate equipped shuttle bus catering to the older passenger*
Zagofsky, A. (2014) Senior Shuttle in Use [Online image] Retrieved November 26, 2016

In fact, most of the interviewees, both female and male, noted that they currently had no concerns over their own personal safety in open space settings, but noted that may be changing. For example:

> *"So I mean in the past you never bothered because you're going to get idiots like that [at the park], course you are, but in the main generally people are safe but that's going now."* Male, England, age 79.

And…

> *"No [I don't feel unsafe]. I mean I know people who feel that way about it but when I'm walking, very seldom I'm the only person. Usually there are other people around and generally speaking it's [the park] always been a*

*very friendly sort of place. I mean you meet somebody, you say "Have a good morning" or "Morning" or something."* Female, Canada, age 83.

Many interviewees believed that having people around was all that was required for safety in and around open space locations. For example, one interviewee laughed when she shared:

*"...and my daughter says "You should take your phone, mum. Something might happen while you're walking round". I said "Within five minutes there's so many people walking around that pathway that you don't have to worry. You wouldn't have to wait long for somebody to come along and help".* Female, Australia, age 74.

Another noted:

*"I love small children. I think there's no greater safeguard in life than being around small children because I mean they've always got adults with them so there are other adults."* Female, Australia, age 89.

Currently, quantity of seating adjacent to playground areas is inadequate, as referenced by many interviewees and survey respondents. Approximately 75% of interviewees indicated enjoyment in spending time with their grandchildren at parks, yet lamented the lack of appropriate seating. This prohibits respondents from properly enjoying the space alongside children, which clearly is important to enable them to feel safe, and may also help to fulfil needs for relatedness.

Some interviewees acknowledged circumstances that had occurred in their local areas relating to assaults or thefts, but were not concerned for themselves.

*"No, no, I don't [fear for my own safety], but I do feel annoyed. We had a couple of ladies harassed down there and I'm a firm believer you should be*

*able to walk any time regardless of who you are or what you are…and that was really annoying, that, these two ladies…I think it was at about seven o'clock at night."* Male, Australia, age 72 (chronic arthritis sufferer).

Regardless of the context, these excerpts indicate clearly that the need for autonomy can be fulfilled or thwarted through what many would consider as everyday occurrences, which might be avoidable if acknowledged in the planning process.

**Community.** Location elements relating to community were discussed by approximately 55% of interviewees. Primarily, interviewees commented on the proximity of open space to their residences (approximately 30%). The closer the open space to residences, the more convenient the access, and the more likely the space can be accessed by the individual, fulfilling the need for autonomy. Other respondents discussed the lack of parks within community infrastructure, such as a neighbourhood or village open space (approximately 15%). Those who discussed these issues were typically quite impassioned about the planning principles applied to which location gets the park and which one doesn't. For example:

*"No, it wasn't planned upfront. No, I think the council just decided it was easier and cheaper to manage a bigger park than a smaller one. They had to give us ten per cent (of developable land dedicated for open space). But the suburbs that have got it, [the ones that] have got more parks, actually, are the suburbs where the land was not so expensive."* Male, Australia, age 76 (retired urban planner).

And…

*"But around here there's not a lot of parks. We bought this block specifically because a park was going to be not in the next block but the block next to that…the council wouldn't put on the water so…they took that away and amalgamated it down in Myaree (suburb), which has got a lot of*

> *parks. It's [Myaree] really well off for parks, but round here, we've got very little."* Female, Australia, age 76.

In circumstances where interviewees had limited park infrastructure in close proximity, some indicated, in a relatively light-hearted tone:

> *"No, we drive there. We drive. Yes, we drive to walk. Yeah, which is a bit stupid, I know. But you shouldn't really have to do that."* Male, Australia, age 76.

These excerpts, while not an uncommon occurrence in relation to proximity of open space to residences, are of particular concern for older adults, who have fewer mobility options than much of the population, and yet crucially require activity for sustained health and well-being.

### iv. Policy-Related Elements.

Several other second order codes emerged, including shared-use space (considering the impacts of the activities of others such as cycling and dogs) and Council initiatives (including access to park information, community consultation, park programs, and Council involvement). Interviewees indicated that these codes were more related to Council (local government) and their involvement in open space via policy decisions. These codes related to aspects of shared open space use such as shared-use paths and presence of dogs. Other aspects related to general Council initiatives such as access to information, community consultation, programs in parks, and quantity of amenities.

**Shared Use.** A second order category within the policy theme pertained to the circumstances that arise when multiple users with different needs all use the same space. This

second-order code included shared-use or multi-use paths and the presence of dogs in open space and park locations. These two elements deserve individual attention due the frequency they were mentioned and the strength of emotions expressed when interviewees referred to them.

***Shared-use paths***. These paths are commonly referred to as multi-use paths, and provide approximately 172km (107 miles) of linear pathways throughout the metropolitan area in which this research was conducted (See Figures 12, 13, and 14 below). They are designed to be used for pedestrians and cyclists alike. The state's Department of Main Roads anticipates an increase in these shared-use paths from 172km to approximately 850km (530 miles) by the year 2050. Endorsement of this mode of people movement is applied successfully in many countries around the world, yet the metropolitan area in which this research was conducted seems to have developed a friction among these amenities. As one interviewee observed:

> *"...I think that is one of the things that's a bit bizarre in [this city]...Cycling to me here is very competitive, it's very macho; they're all in their lycra and they go so fast and they have these really expensive bicycles. But we've always looked at it – we've commented on this for years – and because you're conscious that there are older, more frail people and you think well, God, if they get hit the consequences are quite life-threatening, really."*
> Female, New Zealand, age 65.

And…

> *"Well, it was one (park) where instead of being able to allow the grandchildren the freedom to just play their game of cricket and not worry about where the ball went and that sort of thing, you had to be constantly making sure that they weren't going to get knocked over by a bicycle."*
> Female, Australia, age 76.


***Figure 12:*** *Typical shared-use path signage for pedestrians and cyclists.*
Reid Hwy shared path [Online Image]. (2013). Retrieved November 26, 2016

***Figure 13:*** *Typical shared-use path for pedestrians and cyclists.*
[Untitled illustration of a shared bike path in use in Perth]. Retrieved November 26, 2016

***Figure 14:*** *Congestion and conflict - shared-use path*
Cyclists v. Pedestrians [Online Image]. Retrieved November 26, 2016

When asked for potential solutions to the shared-use path safety issue, one interviewee, who had retired from a lengthy architecture career, indicated that the solution is:

> *"Just by separation. As I said, there was plenty of space (at the park)…they didn't have to put the cycleway right next to the picnic area and the barbeque….and cyclists are not looking at the view, they're looking straight ahead. They want to get home…or they're doing their exercise, most of them, or whatever. Yeah, the whole thing's rather a tragedy, really, of stupidity. You only have to go to places like Copenhagen to see that pedestrians, cyclists and motorists can all live very happily together.* Male, Australia, age 77.

Another simply replied:

> *"I don't know that there is a solution because people are very selfish and self-centred. Not necessarily selfish, they don't mean to be selfish, but people become very focused when they're doing something. It may not even register that they've come past you."* Female, Ireland, age 66.

One interviewee who had retired from a career as an urban planner voiced his opinions quite strongly by stating:

> *"I have no problem with people riding bicycles in a recreational sense but speeding at 60Kms (35mph) or whatever along a pedestrian path irks me no end; I feel like sticking a stick in their spokes…You can't have a shared path, I don't think, if it's going to be used by commuters for recreation. You know, riding with your children or whatever, lolling around down on the foreshore, that's fine, I have no problem with that, but if you're going to use these paths for commuting, somebody's got to make up their mind just to who does what.*
> Male, Australia, age 71.

To all interviewees, the shared-use path phenomenon presented a large problem. Many indicated they would never walk on a shared-use path, and given the planned 400 percent increase in shared-use path provision over the next thirty five years, this presents a large reduction in safe walking opportunities for many older adults in this metropolitan area. Many interviewees suggested policing or Park Ranger presence, issuing of fines, rider education, separation of discrete path uses (pedestrian and bicycle), and strict speed limits to combat the danger. All of these suggestions fall under the policy category, with many admitting it would be hard to monitor the outcomes. Perhaps the most logical suggestion came from the 71 year old male (see excerpt above on page 155), who proposed separation of uses based on commuting versus recreational riding. As the Perth metropolitan area has clear routes of cycle commuting versus path locations where recreational riding is clearly the dominant use, this suggestion has potential for consideration toward relieving conflict before more kilometres of dangerous shared-use paths are constructed.

Unfortunately, this problem with shared-use paths isn't restricted to the Perth metropolitan area. All cities and states in Australia have shared-use paths as part of their infrastructure, while many other countries also utilize these amenities. All locations experience issues with speed, accidents, and conflict between cyclists and pedestrians. Each state in Australia has conducted research into the issues and have all reported similar findings. Little attention, however, has been paid to the potentially life-threatening impacts on older adults. For example, cases remain where even relatively slow-moving recreational cyclists have been reportedly involved in very serious accidents with elderly pedestrians. An example from the Los Angeles Times in late 2016 reported a 65-year old woman was struck from behind by a cyclist while on her morning walk on a shared-use path and was placed in Intensive Care due to severe head injuries (Eastsider, Oct, 2016). This is a grave concern that must be addressed in policy, planning, and design for future safety.

***Unleashed dogs.*** The presence of dogs in parks is a common occurrence across the world. Many park visitors enjoy time with their pets and many municipalities have rules in place to maintain safety and order in public open spaces. As interviews revealed, it is only when rules are not followed that issues arise.

> *"Well, if dog owners kept to the rules there wouldn't be a problem…Not many people are in control of their dogs when they take them walking…"*
> Female, Australia, age 76.

Interviewees offered suggestions for ways of reducing the dog problem in parks and open space. One interviewee acknowledged the problem and conveyed a council-endorsed solution:

> *"Well, certainly dogs in some places can be a terrible problem. [This specific city] put out a masterplan about five or six years ago which actually*

> *went up to about 2020. One of the things that they want to do is to fence off an area and have that as a dog place where you can let your dog run free if you want to – whether that will work or not..."* Female, Canada, age 83.

However, the primary concern for older adults is the danger of being physically frail and being in the presence of a dog off the lead. As one interviewee shared:

> *"... I have a friend that got tripped up by a dog over in the Shopping Centre on the footpath and she broke her pelvis and it was all downhill from that point..."* Female, Australia, age 89.

Shared-use paths and dogs have arisen as the two primary safety concerns for older adults in shared open space use, which reduce their sense of autonomy and competence. Resolutions proposed involve planning, policy, design, and post-occupancy management intervention. In contrast to many of the previous elements of open space discussed in interviews (addressing personal preferences and aesthetic considerations), shared-use paths and dogs present safety issues which must be addressed by built environment professionals. For many cities, this is a time-critical challenge.

**Council initiatives.** Council (local government) is typically responsible for operating, maintaining, and further developing open space locations in Australia. In this second order code, many diverse responsibilities were revealed through the allocation of first order codes addressing "Access to Information", "Programs in Parks", "Community Consultation", Quantity of Amenities", and general "Council Involvement" in open space matters.

Interviewees expressed many diverse impressions of Council involvement in the open space experiences of older adults. Some indicated frequent interaction with Council representatives regarding elements of their local open space, while others had never experienced

communication or interaction in any way with their local Council representatives on the subject of open space. Those that did reveal interactions with Council during their interviews, also indicated frustrations on many occasions at the ineffective responses of Council to their concerns.

Interviewees expressed negative impressions of availability of information relating to open space:

> *"...particularly in springtime we might head towards the hills [Perth Hills], so you're working out where to go…I think there's a bit of a lack of information about walking in the hills up there…the 'Bibulmun Track' [bush walking track]…I find their information booklet slightly bizarre. I don't know if you've looked closely at that?"* Female, New Zealand, age 65.

And…

> *"You know, if you're trying to work out where to access it [the park] and go for a day walk, you really have to apply yourself to work it out."* Male, Ireland, age 66.

Related to access to information was the availability of information relating to programs in parks. Australia typically doesn't provide as much structured programming for open space as can be found, for example, in the United States. Yet interviewees expressed their belief that there was room for more programming relating to activities in open space:

> *"I hate to think about myself ageing but I think we're ageing at a very fortunate time because you've got this very middle class society with a fair amount of cash and you can see all these entrepreneurs who are actually setting up more and more things because I think that they're seeing people like us come through…I do think WA [Western Australia] – not necessarily*

*Perth, but WA – could do a lot more but again aimed at the person who - we're still fit enough you know."* Female, New Zealand, age 65.

And…

*I think it would be interesting if you look at those activities that were going on in the park in Vietnam [during a recent trip there], the badminton and the ballroom dancing and everything, if you had all those activities happening in the park here that were organised instead of in a community hall."* Male, Ireland, age 66.

Interviewees, indicated their desires to have access to these program options, but didn't indicate an opinion regarding which entity (Council or private enterprise) would likely be most responsible for providing the options. When asked if they had ever been approached by Council on these kinds of issues (or others relating to other aspects of open space), one interviewee thoughtfully responded:

*"I think it's one of those things you can't help but say that in theory it's a good idea…but would they get people to respond? Thinking past, yes, we probably wouldn't have. We might have been interested but you're just too busy and too focused on what you have to do on a day to day basis. You probably wouldn't get involved. I would now I'm retired and got more time on my hands."* Female, New Zealand, age 65.

Another indicated that he had an opportunity but not in relation to open space specifically:

*"Yeah, this current development that's going on. There's a consultation group for that…but they don't ask about the park...[the last one] was when they were pushing that Reid Highway through and so people were protesting."* Male, Ireland, age 66.

However, one male interviewee held great faith in the process and the ability for Council to gain benefit from community consultation (resulting from his professional experiences with community consultation during his time as an architect and urban planner):

> *"…in terms of dealing with the public domain, I have great faith that the public can be brought along with it and can do wonderful things…because they have that commitment to them."* Male, Australia, age 77.

This is yet another example of extended responsibilities that could be undertaken by Council and other local government entities in relation to involvement with the public. Many interviewees indicated that they believed Council was doing a good job of providing open space amenities and maintaining them. However, in some cases, interviewees simply didn't know what Council could do differently. For example, regarding the shared-use path concerns expressed previously, one interviewee lamented:

> *"I don't know what they could really do. You know, [cyclists] just don't think. Some of the people walking over there are more senior people and if somebody comes up nearly beside you and rings a [bicycle] bell, yeah, you nearly drop dead. So I think there should be some sort of policing this park especially. Other little parks you wouldn't need to be worried about people riding."* Female, Australia, age 74.

In most cases similar to this one, interviewees simply weren't aware of other Council responsibilities and opportunities for involvement. This typically resulted in comments similar to that noted above. However, interviewees were aware of the responsibility of Council in arbitrating between different residential groups on park amenities. In one example, a female interviewee recounted a debate among residents of her retirement village regarding quantity of public barbecue facilities at the local park that directly involve Council mediation. She noted:

> *"Well, I agree with them that if they want to make more barbeque places and such…but we have people in the village that are dead against it and they got up a petition when it was suggested that they turn this area into barbeques and it would mean they'd put in a toilet block and all the rest of it and they felt, no, that it was infringing on our view and all the rest of it, which I think is mean in a way. I mean there are more and more people. Why not give them [facilities] if that's what they want to do? It's such a nice innocent type of occupation."* Female, Canada, age 83.

These excerpts suggest that there is desire expressed by interviewees for greater Council involvement across many responsibilities to enhance the amenities of open spaces, but there is not adequate information available to educate the public on the actual responsibilities of various Council departments and their representatives' jurisdictional abilities.

### v. Design-Related Elements.

The final category of codes pertained to aspects of the open space that fall within the design realm. These related to elements that overlapped with some of those in the quantitative survey, including infrastructure (such as elements of seating, shade, signage, and restroom facilities), exercise (such as exercise equipment and sporting fields), and natural environment (including vegetation, wildlife, and water).

**Natural Environment.** 75% of respondents discussed the importance of experiences with the natural environment as a key component which contributed to their visits to parks. This corroborated evidence from the quantitative results, which indicated that amenity elements relating to the natural environment were the strongest predictors of fulfilling needs for autonomy

in older adults. The qualitative data contributed toward a refined understanding of this important amenity. When asked to articulate their preference for open space, interviewees indicated:

> *"It's not a playing field, it's not a barbeque area, it's not, you know, any of those sort of things – no, it's not a playground type of thing. To me, a park has a particular connotation and that is as much as possible a natural space in which you can commune with nature and be part of it."* Female, Australia, age 74.

And…

> *"…just with the trees and the grass and everything and I think that's fundamentally where I'm coming from. A park to me is a natural space where you connect with nature."* Male, England, age 86.

Many interviewees (approximately 50% of all interviewees) also indicated their preferences for certain aspects of the natural environment and the particular open space locations where they readily go to interact with or see these preferred elements. Many comments were offered regarding the wildlife aspects of the natural environment. Interviewees spoke of certain birds, reptiles, or animals with a sense of vested interest and attachment, indicating a strong connection to the place because of the presence and familiarity of particular wildlife elements. One interviewee excitedly remarked:

> *"…but the interesting thing about that park is the wildlife. In the lake there, there's long-necked turtles…and then there where the snakes that appeared…a Tiger Snake there and it would have been probably the first time out for a year.* Female, New Zealand, age 65.

And…

> *"And also we've got some resident Tawny Frogmouths (bird) in the trees down here and so that brings people – I've been onto the council and they've put a little fence around (for protection) and all of that sort of thing – so there's an interest in nature, brings people close and it's rejuvenating."* Female, Australia, age 74.

Some interviewees indicated a clear and passionate stewardship over wildlife presence in open space. One particularly vocal and defensive interviewee stated:

> *"So that's the basis of it and so I'm extremely protective against the developers in terms of wanting to bring human beings as the primary sort of user in and dominate – I mean I've even had the signs down there changed from "Beware of snakes" to "Snakes live here. If you see one, walk quietly away".* Female, Australia, age 74.

Other elements of the natural environment receiving ample attention by interviewees pertained to vegetation, both its presence and quality. Excerpts indicated an acute environmental awareness on the part of some interviewees, with comments indicating a change in preference due to environmental conditions and water shortages:

> *"But with parks I like to see a lot of trees in the parks, not so much flowers because we're going to have a lot of shortage of water…so I don't think you want flowers now, you want more native trees."* Female, Australia, age 74.

Finally, water elements were mentioned by approximately 40% of interviewees when asked about higher order preferences for natural environment. Some comments related to human-made water elements, indicating that these were preferred over none at all. However, many agreed that water elements in open space were important for fulfilling choice and providing gathering opportunities:

> *"Yeah, we call it the Duck Pond. It's got a big water feature in the middle which makes it quite conducive to people sitting around and looking, whatever."* Female, Australia, age 76.

**Exercise.** In comparison to the natural environment, amenities relating to exercise among older adults over 65 were not as strongly related to the fulfilment of needs for autonomy. Corroborating this, interview data revealed very little focus on exercise-specific pursuits, such as park exercise equipment and sporting ovals and grounds, and more focus on simple amenities such as walking paths. These decisions governing involvement in exercise by older adults stem primarily from deficiencies in their physical abilities. This acceptance of physical deficiency in older adults was more prominent in those interviewees over 75 than those between 65 and 75. Most of the interviewees participating in frequent walking for pleasure were between 65 and 70. Those above this age tended to reflect on their need to walk to maintain health or in response to medical recommendations.

The restricted physical abilities of older adults were evident in the interviewees' preference for exercise:

> *"Mainly walking. I don't take part in any sports now."* Male, England, age 79.

And…

> *"But, yeah, I guess sort of more [gentle] – we don't need much…I mean a lot of the parks cater for the fitness fanatics now and they have all these things that you can do…all the weight things…"* Female, South Africa, age 72.

Many interviewees discussed the requirements with regard to their exercise walking regime:

> *"Uneven surfaces are a great problem for elderly people."* Female, Australia, age 66.

And…

> *"Nowadays we seem to need something a bit solid underfoot."* Female, Australia, age 76.

And finally…

> *"…but the other thing that always struck me was the unevenness…we just walk and yet it's never a problem and I used to live in fear of him (Dad) falling over and Mum actually got a bit older and shuffle, shuffle, shuffle…it just seems to happen as people get older…and again I think if you're talking about an older aged person that would be a really common point, risk of falling over."* Female, New Zealand, age 65.

As many older adult interviewees had indicated, walking is the preferred exercise for older adults. The lack of physical exertion and the low impact of this activity suit the typical older adult's physical condition. Further, walking can be a social activity or an activity of solitude, and it can involve other open space amenities, such as those relating to the natural environment. Finally, walking fulfils needs for autonomy and competence and satisfies the medical recommendations for 30 minutes of activity daily. These quintessential open space surfaces require singular consideration from planners and designers to be truly successful in fulfilling needs for autonomy and competence in older adults.

**Infrastructure.** Although infrastructure did not feature strongly in the quantitative results as a means of fulfilling the need for autonomy in older adults aged 65 and over, approximately 35% of interviewees mentioned aspects of these elements, primarily from the negative perspective, namely that infrastructural elements were not adequate, and how they could

be improved. These negative comments also contained frustration in some cases at the inclusion of too many infrastructural elements at the expense of nature. One of the elements mentioned by interviewees was the restroom facility as a necessary inclusion for older adults (and also for younger children such as grandchildren). When asked which infrastructural element was the most important, one interviewee commented:

> *"Well, I think you'd need to have a loo (toilet) and of course most public places are very short on that…they (grandchildren) play a lot of sport on some of those ovals (sporting fields) and I don't know…they've got a park with playground, sporting facilities there, change rooms and whatnot but they're always locked up. So if you're walking the dog or the grandkids go to play you can't normally get in there."* Female, South Africa, age 72.

Locked toilets would be considered as a deterrent for open space use for any age group. In the case illustrated here, the policy across many councils is to secure restroom and change facilities unless there is an organized event or a sporting event where the quantity of users justifies the risk of vandalism or illicit use of the amenity. Unfortunately, this policy frequently promotes non-use by community members, particular those who require these facilities more often.

In contrast, one interviewee considered elements of infrastructure that would improve the community feel of a local open space. To address this, the interviewee proposed:

> *"...but I do look at parks like that Carine Open Space and going, you know, "If you had a lot more seating areas under nice trees, café accessible, it would be much more of a community space."* Female, New Zealand, age 65.

Open space use at night was a common theme among interviewees. Approximately 25% lamented the fact that they didn't feel they could use parks safely at night due to their age-related frailties. One interviewee commented:

> *"Yeah, but then again, of course, the other thing, I suppose, lighting and security at night for parks, you know, that's another thing. You've just got to take it and go at the right time or take a big dog with you."* Male, England, age 86.

In response to this, interviewees proposed open space lighting and the potential for making a difference to their experience of security at night, to which one interviewee questioned:

> *"Yeah, but you go back and think "Well, hang on. If we put lights all around the park is that going to make any effect or not?" You don't know, do you?"* Male, Australia, age 72.

Another critical element of infrastructure for open space in Australia is shade. Summer temperatures frequently reach the low 40's Celsius, (equivalent to the low 100's Fahrenheit). Provision of this most basic of elements is crucial to open space use and revisitation by older adults. Most interviewees mentioned shade as one thing they could not compromise on, and that this was needed in both quality and quantity. For example, when asked what older adults want in open spaces, one interviewee emphatically stated:

> *"And that's what people want. They usually will take along their own chairs but the shade, they want the shade."* Female, Australia, age 81.

And…

> *"Well, given this climate, shade. And talking about the lovely green open spaces on the sandy edges (of the beach), a lot of them don't have a lot of*

*trees…and the ones that flock to the trees grab it all."* Female, Australia, age 70.

**Visual impacts.** Another important second order code addressed visual impacts of park and open space elements on the older adult visitor. This code contained first order codes relating to more positive experiences of "Visual appeal" of the park and also "Visual engagement" while at the park. Further, it considered the more negative ramifications of "Concealed locations" due to, for example, overgrown vegetation and the impact on feelings of safety. As interviewees had indicated, many were unable to participate in active pursuits due to physical limitations associated with their age. These limitations require older adult park visitors to adjust the focus of their activities to more passive pursuits, which many had indicated were focused on viewing scenes and watching people. Due to these changes in focus, the visual appeal of the park became an important consideration for visitation. In appreciation of a particularly appealing scene, one interviewee commented:

*"It was a classic Perth spring day, nice and green, all the colours, lots of natural native bush."* Female, New Zealand, age 65.

In contrast, a less appealing scene was described by one male interviewee who indicated he was at the end of his appreciation for a particular open space near his home, therefore, possibly compromising his intent to revisit the park as frequently:

*"…we've walked around that park in the morning so many times and I've sort of reached a point now where I'm so bored with that park and I'm taking for granted the fact that I've got the open space there and I sort of look at it now and I actually see it as quite a barren space... it's probably because I've done it so much, I don't know, but I think it's quite a boring space."* Male, Ireland, age 66.

The awareness expressed by older adults of what is available and what they would prefer regarding visual appeal was articulated by a female interviewee, who compared her local park to that of another suburb in close proximity:

> *"…which we don't have much of this end [green parks]. It's all sand and water and sand dunes whereas [the other suburb] has all that lovely grassed area."* Female, Australia, age 70.

Another visual component of a successful visit is visual engagement while in the park. Many interviewees indicated the importance of this aspect of their open space experience with simple acknowledgement of preference for passive activity:

> *"Well, I like to watch people and watch things, people watch, and I'm quite happy to sit on a bench and watch what's going on."* Female, Australia, age 76.

When asked of opinions of the current provision of open space amenities from the visual perspective, approximately one-third were quite satisfied, one-third were dissatisfied, and the remaining one-third expressed no strong opinions. One interviewee expressed dissatisfaction with the general development process used in current open space (and housing) provision by commenting:

> *"It was lovely [previous housing development]. All they did was have the front drive and the house, sitting in this bush. Now, I really object to so-called new developments – and there's one going on just around the corner…everything is completely bulldozed, everything!"* Female, Australia, age 76.

These comments imply simplicity in the preferences of older adults for visual elements of open space experiences and the broader urban fabric as a whole. In addition to complete removal

of native vegetation in the development process, another negative aspect was that of overgrown vegetation in open space. To some, this presented an issue of concern for personal safety, even though this aspect did not prove to be significant in the quantitative survey results. Two particular excerpts illustrated this concern for safety, having the potential to reduce visitation for the individuals involved:

> *"Now, we used to walk there and they had quite a big lake and it was quite a long way around and when you got around there they had a lot of old Geraldton Wax [native species of vegetation], a lot of old saltbush and that…but it was so dangerous for people, particularly women walking on their own. There've been a couple of attacks there…and they [Council] did get into that and thin it out a bit…but we decided we don't go there anymore..."* Female, Australia, age 81.

And…

> *"…but I've done some walking since we came to this area and though we enjoy Bold Park, I wouldn't go into Bold Park on my own…I find that it's certainly very 'au natural' but I think there are plenty of little areas where nasty things could happen to people walking alone...when I walk I'm, "Oh, I won't walk here. There's no lighting". A lot of younger women wouldn't even think of that."* Female, Australia, age 72.

These excerpts indicate the importance to older adults of visual elements of open space to their enjoyment and intent to revisit certain open space locations. Concerns for safety do become quite important for some older adults and should be considerations for planning, policy, design, and perhaps more so, maintenance policies post-construction.

In summary, I return to the questions posed at the beginning of this chapter. When considering ways in which older adults are motivated to engage in open space, interviewees

indicated that less complicated elements (such as simple walking paths or nice views) are more appealing and therefore more fulfilling of their needs for autonomy, competence, and relatedness. Primarily, when autonomy needs are fulfilled, there is more likelihood of revisitation. For example, when older adults can undertake tasks on their own, such as walking in a park, autonomy needs are fulfilled and older adults are more motivated to visit parks. Autonomy need fulfilment can be achieved by providing even textured, flat walking paths and regular age appropriate seating.

When considering the factors that promote open space access among older adults, interviewees revealed a strong preference for elements of the natural environment, either the components mentioned here (wildlife, water, and vegetation), or a general philosophy of connection with nature (as indicated in excerpts above), or the calming effects on an individual. Interview data indicated lack of interest in sporting pursuits or vigorous exercise regimes by older adults aged 65 and over and a strong preference for more passive pursuits, such as walking, viewing, and sitting. In addition, comments clearly favoured ecological versus human-made or contrived natural elements, indicating a strong preference that can readily provide guidelines for planners and designers when developing the location or concept for open space inclusion in community plans. In addition, there were many opportunities articulated for further Council involvement in making open space more accessible to older adults and to harness the knowledge held by older adults of their preferences for open space provision and use.

Finally, when addressing the ways in which open space provision, design, and management processes can cater to the needs and motivations of older adults to increase visitation, there are many efforts that can be applied by planners and landscape architects to achieve this goal. These will be discussed in the next chapter.

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Frequency of Social Interaction | Post-Retirement Perspectives | Life Stage Insights | 1 | 5 | "Well, I've been told – I've been to my daughter's in Melbourne; one is overseas and one's here – they said to me "You've got to get a life". Now I've got a life they ring up and say "Hello, Machine, how are you? If mum gets time will she give me a ring back?" I said "Well, you told me to get a life" and now I'm never home." |
| Loneliness | | | 2 | 4 | As you can appreciate when you live in a retirement village, weekends are very lonely...So, you know, if you've got something to go to on the weekend it just makes it easier. |
| Change in Life's Routines | | | 1 | 4 | "We've both worked in jobs where you've got people around you so in many ways your social needs are met there. Now, when you stop working, to me there are a few things that suddenly flip over. It doesn't change that you want access to the outdoors but you have got seven days a week to do it and we both still just want outdoors, not indoors all the time but there's probably a bit of need for the social interaction to be happening in some way or other. And that's where I wonder where that's going to come from to me so often on the weekend I'm just thinking "Can we please have nothing organised this weekend" so that to me is heaven whereas now we're looking for some form of structure and organised and all of those things that I've been appalled at in the past. So I think just sort of thinking in terms of the general values underpinning what you're talking about, there's got to be social dimensions for older people or people once they stop working and it matters… I think it's during the week that it seems to happen more for older folks and then the weekends actually free for their families..." |
| Daily Activity and Health | | | 2 | 8 | I think it's just the sort of life that we can – I mean fifty, sixty years ago you would be sitting in a wheelchair or a rocking chair by the fire or something like that whereas now everybody in my generation has had the experiences because most of them had worked at some time but the way they've always lived they have an interest in things. Not so much men, of course. Men are notoriously bad retirees because they just don't know what to do with themselves. |
| Available Time | | | 1 | 2 | I have no idea how I had time to go to work. It's just crazy. |
| Cognitive Incapacity | Age Discrimination | | 2 | 3 | "Yeah, well, I don't talk about my age deliberately because people then assume that you're retired or beginning to lose the plot, all those sorts of things which I don't want people to think." |
| Working Over 65 | | | 1 | 2 | "I'm still working. I'm enjoying working and I don't like people to think, "Oh, well, we won't give the next job to him. I'll try somebody younger"." |

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Quality of Design | Perspectives on the Built Environment | Life Stage Insights | 2 | 5 | Yeah. Well, design's my business or was. Still is, really. I look at everything with a designer's eye and most of the time I'm distraught because the quality of design has gone to hell. |
| Professional Qualifications | | | 1 | 3 | Heritage has been the bane of architects' lives. Although it started out with the right idea, it's been taken over by greenies and others who know nothing about architecture or the quality of buildings and anything that has some historical background is now heritage and I could anticipate that this will happen with parks and landscape....And these won't be people that really understand what it's all about but they're pushing that barrow. |
| Change in Open Space use | | | 2 | 9 | But the older you get, I suppose you're looking more for passive parks than active parks. |
| Technology Use in Open Space | | | 1 | 2 | No. I just feel sorry that they're missing out [while wearing headphones in the park]. I mean you don't need music because there's birds and they are missing probably about sixty per cent of what I'm receiving. Yeah, but that's modern people. |
| | | **Totals** | **16** | **47** | |

***Table 66:*** *Interview data – Life Stage Insights*

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Autonomy Fulfillment | **Need for Autonomy** | **Psychological Experience of Open Space** | 4 | 13 | "…but I find walking is enough. In fact, the doctor said "Are you doing any exercise?" I said "Oh, come off it. I haven't got time to put more exercise in". I said "I walk for an hour of a morning and if it's right round the lake it's an hour and a half. I go to carpet bowls in the afternoon". I said "I swim sometimes when it's hot". |
| Autonomy Dissatisfaction | | | | | "But there's too many people building parks now and I suppose they'll put – but no trees, no shade, not thinking of people who might just want to go and sit in a park." |
| Competence Fulfillment | **Need for Competence** | | 4 | 10 | "And we went into the Botanical Gardens and I was battling to walk but I thought "I'm going to do it, I'm going to do it". |
| Competence Dissatisfaction | | | 2 | 3 | "I used to go with a neighbour for a swim every morning but then I did have a broken leg back in the 1990. In one year I had a broken leg and a broken pelvis - I just had a thyroid problem – and I didn't get down to swim much after that." |
| Relatedness Fulfillment | **Need for Relatedness** | | 4 | 8 | "But in the park - as I said the people so far around the lake here and it's not all from the village. They're from all kinds of walks and they'll always be polite and say "Good morning" or "How are you?" type of thing…It makes you want to be there more often." |
| | | **Totals** | **12** | **34** | |

***Table 67:*** *Interview data - Psychological Experience*

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Access via Organized Transportation | Location Convenience | Open Space Planning Related Elements | 3 | 7 | "Even the council sometimes will have these bus trips but they're older buses they're using. They're not like in the city. Yeah. That is a big thing, yeah, with that, with people clambering up and down the steps...but some people don't go on the outings anymore on some of these tour buses because the seats, they don't go down; they can't get up those steps. So that's another thing that stops people." |
| Available Parking | | | 5 | 11 | "Parking, if there's a lot of people around, parking is the thing. Tell you what is very good that some shires do and they've got it over here at the library now, seniors' parking, if maybe you haven't got ACROD sticker but seniors' parking." |
| Pedestrian Access to Park | | | 9 | 19 | "There's actually an interesting array of age groups in this street and we've got retired people on both sides here, we've got an elderly couple across the road there, but everybody – well most – walk and so having a park that's just so accessible, being able to walk I just think is a really important part of your community and thinking of older people being able to walk around a park." |
| Adjacent Community Composition | Community | | 2 | 5 | "No, it wasn't planned upfront. No, I think the council just decided it was easier and cheaper to manage a bigger park than a smaller one. They had to give us ten per cent. But the suburbs that have got it, have got more parks, actually, are the suburbs where the land was not so expensive." |
| Proximity to Residence | | | 7 | 13 | "No, we drive there. We drive. Yes, we drive to walk. Yeah, which is a bit stupid, I know. But you shouldn't really have to do." |
| Safety | Safety | | 11 | 32 | "I love small children. I think there's no greater safeguard in life than being around small children because I mean they've always got adults with them so there are other adults." |
| | | **Totals** | **16** | **87** | |

***Table 68:*** *Interview data – Planning Related Elements*

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Shared-Use Paths | **Shared-Use Space** | **Open Space Policy Related Elements** | 13 | 52 | "And I think that is one of the things that's a bit bizarre in Perth...Cycling to me here is very competitive, it's very macho; they're all in their lycra and they go so fast and they have these really expensive bicycles. But we've always looked at it – we've commented on this for years – and because you're conscious that there are older, more frail people and you think well, God, if they get hit the consequences are quite life-threatening, really." |
| Dogs | | | 14 | 44 | "...in fact, we had one lady, the dog came up and jumped on her. It was a friendly dog but it jumped on her – she was in her mid-eighties and that – and I said to the woman, you know, "Take your dogs away". "Oh, it's only a pup". I said "If it's only a pup". She said "It needs exercise". I said "You've got all that grassed area away from this path that goes around there". She got a bit hostile and that but the thing was that the paths are for the people walking. The dogs can run away over there." |
| Access to Information | **Council Initiatives** | | 3 | 5 | "You know, if you're trying to work out where to access it and go for a day walk, you really have to apply yourself to work it out." |
| Community Consultation | | | 4 | 8 | "I think it's one of those things…in theory it's a good idea and trying to get people involved in some sort of ownership of it but would they get people to respond. Thinking past, yes, we probably wouldn't have. We might have been interested but you're just too busy and too focused on what you have to do on a day to day basis. You probably wouldn't get involved. I might shortly when I'm retired and got more time on my hands." |
| Council Involvement | | | 13 | 58 | "I don't know what you could really do. You know, they just don't think. Some of the people from here are walking over there are more senior people and if somebody comes up nearly beside you and rings a bell, yeah, you nearly drop dead. So I think there should be some sort of policing this park especially. Other little parks you wouldn't need to be worried about people riding." |
| Programs in Parks | | | 8 | 28 | "Well, we did up at the national park four years ago. He could have killed himself because we didn't realise it at the time but...We went on a wildflower walk, a wildflower stroll it was advertised as. And it was supposed to be on paths, you know, and everything but they took us on the eagle's(?) walk and that was through streams and up rocks and goodness knows what; you had to be a mountain goat to do it. And unbeknown to us he was a time bomb with his heart... He had to pull out." |
| Quantity of Amenities | | | 7 | 9 | "Well, I agree with them that if they want to make more barbeque places…but we have people in the village that are dead against it and they got up a petition when it was suggested that they turn this area into barbeques and it would mean they'd put in a toilet block and all the rest of it and they felt, no, that it was infringing on our view…which I think is mean in a way. I mean there are more and more people. Why not give them if that's what they want to do? It's such a nice innocent type of occupation." |
| | | **Totals** | **16** | **204** | |

***Table 69:*** *Interview data – Policy Related Elements*

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Natural Landscapes | Natural Environment | Open Space Design Related Elements | 7 | 16 | "...just with the trees and the grass and everything and I think that's fundamentally where I'm coming from in terms of a park to me is a natural space where you connect with nature." |
| Vegetation | | | 10 | 16 | "I always find something which is of interest, even if it's just the vegetation and the birds." |
| Water | | | 9 | 18 | "Yeah, we call it the Duck Pond. It's got a big water feature in the middle which makes it quite conducive to people sitting around and looking, whatever." |
| Wildlife | | | 6 | 27 | "And also we've got some resident tawny frogmouths in the trees down here and so that brings people – I've been onto the council and they've put a little fence around and all of that sort of thing – so there's an interest in nature, brings people close and it's rejuvenating." |
| Park Lighting | Infrastructure | | 5 | 8 | "...and I sometimes see young women and that roaming round the park now sometimes in areas that's a bit dark. So they along with, say, me who's elderly or other people, somebody could be waiting for you and accost you. They're not well-lit. The roads are well-lit but some of the paths in certain areas are not well-lit so there's always a risk that the way society's going at the moment that somebody could get attacked." |
| Playgrounds and Skate Parks | | | 9 | 33 | "There's nowhere for them (Grandparents) to sit, there's nothing for them to look at. It's about the play structure and there's maybe one bench and that's about it." |
| Seating | | | 9 | 36 | "There's a seat there which is quite comfortable for people to walk down, straight across, and I don't know how but it's gone lower and lower. And it'd be all right for kids but I tell you, I sit down, I have a job to get out of it, the bench seat has gone so low." |
| Service and Eating Opportunities | | | 12 | 31 | "...but I do look at parks like that Carine Open Space and going, you know, "If you had a lot more seating areas under nice trees, café accessible, it would be much more of a community space." |
| Shade | | | 7 | 12 | "Well, given this climate, shade. And talking about the lovely green open spaces on the sandy edges, a lot of them don't have a lot of trees...and the ones that flock to the trees grab it all. And then umbrellas are deadly on this coast so you don't take umbrellas to the beach." |
| Walking Amenities | | | 11 | 42 | "Uneven surfaces are a great problem for elderly people." |

| Code - 1st Order | Code - 2nd Order | Major Category | Sources | References | Sample Excerpt |
|---|---|---|---|---|---|
| Sporting Amenities | **Exercise** | **Open Space Design Related Elements** | 6 | 11 | "Mainly walking. I don't take part in any sports now. I go and watch me grandsons play in the park, soccer." |
| Visual Appeal | **Visual Impacts** | | 6 | 11 | "Yeah, yeah. Which we don't have much of this end. It's all sand and water and sand dunes whereas Trigg's got all that lovely grassed area." |
| Visual Engagement | | | 5 | 8 | "Well, I like to watch people and watch things, people watch, and I'm quite happy to sit on a bench and watch what's going on." |
| Concealed Locations | | | 4 | 6 | "Now, we used to walk there and they had quite a big lake and it was quite a long way around and when you got around there they had a lot of old Geraldton wax, a lot of old saltbush and that. Yeah. But it was so dangerous for people, women walking on their own. There've been a couple of attacks there and that. And they did get into that and thin it out a bit and that but we decided we don't go..." |

***Table 70:*** *Interview data – Design Related Elements*

# CHAPTER 7: CONCLUSION: RECOMMENDATIONS FOR AGE-FRIENDLY PARKS

A visit to any park indicates that people use parks because doing so is fun, active, and healthy. But why then do some people not visit parks? Is there something keeping them from wanting to go there? And if so, is there anything that can be done to mitigate this? These are the questions that I hoped to confront in undertaking this research. More so, I became acutely aware of the issue of park non-use, witnessing members of my family withdraw from outdoor recreation as they aged. Their reasons were manifold: "My arthritis is playing up and my hips and legs are hurting," "I feel like being alone today," or "I just don't want to go to the park." Upon further interrogation over time, I came to realise that there was clearly something frightening and uncomfortable about going to a park. This fear and hesitation had a detrimental effect on the motivation to visit parks.

Thus the principal questions of this research became not simply "why older adults are not motivated to visit a park?" but also "what can be done to reduce lack of motivation and provide a park environment that is welcoming for them?" As previously discussed, adults aged 65 and over are the least studied of all age groups, regardless of the fact that the representative percentage of these individuals in society is increasing with every passing year. Research has also acknowledged that only 30-40% of all individuals in this demographic engage in the 30 minutes of medically recommended activity per day. The survey and interview data from this study indicated that adults aged 65 and over differ in the level and nature of their motivation to visit parks than younger adults. Specifically, findings indicated that older adults prioritize fulfilling needs for autonomy over needs for competence or relatedness. This indicates a strong goal on which to focus – uncovering which elements of open space generate or enhance fulfilment of the

need for autonomy. In the following sections of this chapter, I will propose ways of considering the human/space interface in creating age-friendly parks from the theoretical perspective but also the implications for practice.

### i. Contributions to Theory.

The primary theoretical contribution of this dissertation is a more complex understanding of constraints in visiting parks and open space as experienced by adults aged 65 and over. Further, in response to these constraints, I provide suggestions for ameliorating them. Past research has tended to focus on direct observable relationships between a demographic characteristic and perceived constraints to open space use. While this approach is a step toward identifying which elements in the built environment are successful and which are not, it doesn't respond to the question of why. If we proceed in design theory with merely a recognition of relationships and not an appreciation of the causes and mechanisms which underlie these relationships, then we are no closer to the comprehensive understanding of our own built environments than we were previously. This study has resulted in a confirmation of which elements of open space are conducive to older adult visitation, yet it has also gone a step further toward understanding why this is the case. For example, we can assume by observing older adults in their open space interactions that walking is a favorite activity for this group. But why is that so? And what about those older adults that don't like to walk? By identifying the importance of fulfilling needs such as autonomy, competence, and relatedness, we have the tools with which to uncover the motivation behind actions or inactions. Without this additional layer of explanation, we simply have a visual correlation between older adults and walking paths,

which doesn't serve the entire population, including those who are reluctant to use the walking path.

Unfortunately, the complexity increases when we acknowledge that not all walking paths are equal. Simply providing a ribbon of concrete across the landscape, does not mean that we fulfil the needs of older adult park users. As this research has shown, elements such as location, texture, evenness, path origin and destination, convenience, and the presence of adjacent elements such as nature, all contribute to the relative success or failure of the quintessential path for an older adult. And such elements are critical because they help to fulfil needs for autonomy, in particular. Thus, the results of this study provide a basis from which to develop planning and design theory that is directly applicable to older adults and their relative needs and preferences. The following sections elaborate upon contributions afforded by this research to each respective body of theory and consider additional ways in which these theoretical contributions can be extended in the future.

**Psychological Needs Theories.** To date, SDT has yet to be applied in the disciplines of planning and landscape architecture. Accordingly, this research is one of the first to utilize SDT to understand elements of the built environment, and their impact on a specific demographic group. Further, this is one of the first studies to apply SDT to improve the experience of individuals through suggested changes, bridging academia and practice. So an important theoretical contribution of this dissertation is extending the application of SDT into new disciplines.

Additionally, this dissertation has generated knowledge about older adults and their fulfilment of needs in the built environment. The findings extend prior assumptions regarding the

universal applicability of SDT (Gagne & Deci, 2005), in that they showed that although all three needs were important to older and younger adults, the relative importance of the needs was different across these two age groups. Specifically, findings indicated that older adults differ from younger adults in relation to the importance of their needs, confirming that autonomy is of primary importance in the motivational considerations of older adults. Interestingly, within the 65 and older age group, there were also gender differences for two of the three needs (autonomy and relatedness were more important for women than men). Although this finding pertained to the motivation of visiting open space, a similar pattern might arise with other behaviors, and this is an important empirical direction suggested for the future of SDT research.

An additional empirical direction is the connection between SDT, Lawton's Environmental Press and ways in which needs in the built environment may be satisfied, either through manipulation of the environment to suit the individual needs of older adults, or by adaptation of the individual toward a greater mastery of their environment. SDT may indeed be poised to further the practical outcomes of Environment Press theory in furthering understanding of older adult needs and the potential applications in the planning and design of the built environment. Bringing such research back to the built environment will facilitate a greater understanding of the interactions between individuals and their environment which, similarly to the outcomes of this dissertation, has the potential to inform theory toward a built form which is more comprehensive and conducive to use by all social groups.

**Access Theory.** The literature addressing access in the built environment is typically divided into realms of investigation considering symbolic, physical, social, and psychological access (noted previously) which, according to Bonilla (2013), affords representation of different meanings to different people. Symbolically, public spaces act as creators of collective identity at

the neighborhood, city, or country level (Carr et al., 1992; Francis, 1987; Low, 2000). Physically, public spaces represent communication channels in cities, expressing morphological, environmental, and aesthetic values (Krier, 1979; Lynch, 1960; Woolley, 2003).

Each of these realms pertaining to access (as noted above) is discrete, yet individuals have the potential to interact with each of these realms at different times, and in different circumstances. It is through a comprehension of this complexity and the accompanying needs and motivations of an individual in these discrete circumstances that we begin to understand the ways in which individuals from different social groups experience their environment, and how they choose to interact with it.

These needs and motivations, experienced by each individual in each social group are understood through psychological needs theories as discussed above. This dissertation has used such theories to better understand the needs of older adults, their motivations that encourage open space access and visitation, and the ways in which the built form can have positive or negative impacts on their experiences. This work extends the access literature to consider specific psychological components (i.e., needs as motivators) which in turn likely contribute to the symbolic, physical, and social elements of access.

Primarily, this research has provided a more precise understanding of these theoretical psychological elements, yet has also generated a practical grounding in the ways in which physical form can further connect individuals from various social groups to their environment, yielding a supportive and conducive environment in which to achieve access and a desire for revisitation of open space. For example, when autonomy needs are fulfilled (as shown throughout this research), motivation and ability to access and use a space is increased, therefore

elevating the rate of visitation. Given autonomy needs were even more important for women, this is likely to be more true for women than for men. It is also interesting to note that among the 65 and over age group, relatedness was more important for women and they felt that it was fulfilled to a greater extent through open space visitation than men. This suggests that social access for women in the 65 and over age group is a means of maintaining connections with others, extending our understanding of what contributes to access for this particular demographic.

**Public Participation.** Findings of this study support increased involvement in the public participation process. This involves inclusion of the preferences of individual social groups as a critical component to an appropriate outcome for each social group. Indeed, this observation was also made by Lynch, (1981) who has noted that "fit" between a place and its users can be better achieved by asking the users themselves about their needs and preferences. Specifically, the findings show that older adults place greater importance on fulfilling autonomy needs, and indicates which particular elements of parks help to increase their sense of autonomy. Including older adults in the public participation process is critical to ensuring their autonomy. Inclusion of other demographic groups in the planning process would also reveal other important insights. Without the involvement of members of each respective social group, less than adequate planning results will be produced, perpetuating the problem of non-visitation or reduced visitation of parks by certain groups. So this research provides evidence of the value of including specific demographics, and revealing the mechanisms by which they can contribute to the planning process.

Findings of this research also have the potential to impact social planning. Typically, social planning incorporates the preferences and ambitions of people and communities into strategic policy and directed urban/regional planning initiatives and activities with the aim of

augmenting community well-being and efficacy. The findings of this dissertation inform community development, health and safety, recreation planning, community facilities planning, and social inclusion. For example, community participation has recently experienced a strong shift from a one-way process of public administration (i.e. information dissemination) to a more negotiated outcome resulting from interaction between policy planners and end-users (Bovaird, 2007). Additional knowledge of typical end-user demographic characteristics, and corresponding importance of different motivations and needs, prior to community participation initiatives would generate trust among participants. Such a process would also help to establish clear boundaries around appropriate outcomes as compared to those generated from minimal knowledge of end-user characteristics and user preferences. This will reduce the frequency with which partnerships are based on skewed priorities and hierarchical relationships.

**Survey Scale Development.** The study of discrete social groups in the built environment requires specific measures developed for their explicit social, cultural, and physical nuances. Measurement scales have been developed previously to measure certain aspects of the open space experience, such as tourist satisfaction at urban parks (Jaafar & Tudin, 2010. Another measurement scale designed for testing park-based visitor satisfaction in Australian protected areas (Moore, et al., 2009) was aimed at understanding visitor satisfaction and developing a direct correlation between satisfaction and different open space elements. However, this scale did not indicate why this relationship existed (i.e., the underlying psychological mechanisms). Finally, the Ontario Parks and Recreation Department (Parks and Recreation Ontario, 2012) developed a scale to measure customer value and satisfaction and to track key performance indicators for satisfaction. Again, this scale did not ask questions relating to why satisfaction was

achieved (or not), nor was it suited to understanding certain social groups, their needs and preferences, and their satisfaction.

These previous scales helped to answer questions pertaining to ‘what’ relationships exist, but did not ask the questions regarding ‘why’ this is happening. In contrast, the scale developed in this dissertation takes that next step by asking ‘why’ the sample population experienced open space in certain ways, addressing the inherent drivers of visitation (a behaviour resulting from satisfaction) or the disinclination to visit (i.e., resulting from lack of satisfaction). Further, this extended protocol afforded generalizability in the use of the survey, as it was based on human needs as motivators, and not simply the open space elements present in one location. The scale helped to capture open space needs fulfilment and can be used in many open space locations.

### ii. Contributions to Practice.

The primary issues in physical planning that relate to older adults concern the proximate location of their places of residence to open space. This is demonstrated in excerpts such as the following:

> *“No, we drive there. We drive. Yes, we drive to walk. Yeah, which is a bit stupid, I know. But you shouldn’t really have to do that.”* Male, Australia, age 76 (See Interview Analysis and Findings, page 116).

Respondents such as this one highlight specific aspects of physical planning that reduce the likelihood of open space visitation by older adults. While it is not uncommon for park users to mention proximity of open space to residences, these circumstances are of particular concern for older adults, who have fewer mobility options than much of the population, and yet crucially

require activity for sustained health and well-being. This research indicates why this is so important – because if older adults are unable to get to the park on their own, independently engage with nature, and comfortably make choices about where to sit so as to avoid heat stroke or sunburn, their experience of autonomy is reduced, thereby thwarting fulfilment of the basic human need they hold most dear. The gender differences reported for hypothesis 2 suggest that for men in the 65 and over age group, the convenience of the location is a particularly strong predictor of fulfilment of autonomy as is elements of the natural environment. For women in the 65 and over age group, it is whether the location is embedded within a community as well as elements of the natural environment. Recommendations for practice in these three areas are presented below.

## Recommendations for designing older-adult friendly parks.

***Proximity to Open Space.*** Setting minimum distances between retirement villages and open space will generate a greater opportunity for adherence to the medically recommended 30 minutes of activity per day for older adults. These open space allocations aren't required to be elderly-specific and should be available for use by any member of the community as a shared public amenity. An example of how these opportunities are not afforded was illustrated during one interview, when an elderly male, aged 89, gestured to the park across the road and mentioned that older adult residents were not encouraged to visit the park as it was too dangerous to cross the road between the residential village and the open space. No pedestrian crossings were in place, and there were limited seating opportunities available, if the older adults were actually able to get there. Sadly, the interviewee informed me that in case of emergency, the muster point for the residents was across the road in the adjacent open space. This is a prime example of a missed opportunity that should clearly be avoided.

***Natural Environment.*** As noted previously, there is a pronounced focus on elements of the natural environment from the older adult perspective. Vegetation, wildlife, and the presence of water all ranked highly in interviewees' comments. Interview data illustrated the reduced focus on active pursuits, and increased pursuits of a passive nature. Strong preference was expressed for walking, viewing, and sitting in parks. The surroundings for these passive ventures were considered very important to older adults. To cater to older adults, efforts in physical planning should be focused on location of open space adjacent to natural environments at best, or at least creation of natural environments in newly developed open spaces. Further, retention of those natural environments for increased amenity should be a priority. Providing these spaces enables a connection to nature, including wild life, for which the older adults often expressed great concern and care. Serving as custodian for these spaces was an important past time for many. Engaging in this activity was a means of maintaining autonomy, but also helped to fulfil needs for competence and relatedness, which figured prominently in their positive experiences of parks, and the likelihood they would revisit the space.

***Shade.*** Approximately two-thirds of older adult interviewees in this study indicated the need for increased shade at parks and open spaces. Existing mature vegetation is a critical consideration when siting parks and open spaces during the stages of development. Not only do mature trees provide valuable amenities in aesthetics, they also provide valuable shade that is immediately available upon completion of construction of the project. Physical planners need to be aware of the value of this amenity and utilize its presence to afford a welcoming and comfortable space for older adults to congregate (See Figure 15 below).

Landscape architects can address shortcomings in shade provision by considering the proportion of shade to open area, the length of time it takes for trees to mature once planted, and

the provision of shade shelters and shade structures that can provide instant shade all year round (See figures 16, 17, and 18 below). A combination of these planning and design strategies is likely to help increase the visitation rates of older adults at parks, even during the hotter months of summer.

***Figure 15:*** *Siting of park with mature existing trees providing shade for older adults*

[Untitled illustration of Kings Park and Perth]. Retrieved November 26, 2016


***Figure 16:*** *Young trees provide no shade for older adults*
*Mingor.net, (2012). Alkimos Park [Online Image]. Retrieved November 26, 2016*

***Figure 17:*** *New Park with no shade for older adults*
*Stunning view of the Waterfront Park. [Online Image]. Retrieved November 26, 2016*

***Figure 18:*** *Permanent shade structures providing year round shade for older adults*

*Shade for Desert Breeze Park. [Online Image]. Retrieved November 26, 2016*

**Policy.** Many elements which reduce autonomy fulfilment could be mitigated through careful consideration of the location and policy modifications. Examples include quantitative quotas and qualitative practices, such as incorporation of designated older adult-specific parking spaces (policy and planning consideration), investment in disabled-friendly transit infrastructure (policy considerations), or park ranger patrols during the most likely times that park user harassment might occur (typically early morning or late afternoon when sunlight is reduced and shadows are present). Implementing these policy changes can directly increase the fulfilment of autonomy needs for older adults, and as this research suggests, is likely to result in increased levels of visitation. I discuss three specific policy implications below.

***Dog Parks.*** The presence of dogs in parks brings joy to many visitors. Yet, when dogs are not restrained by their owners, contrary to sign-posted instructions, they have the potential to not only reduce the enjoyment of older adults visiting the park, but produce potentially dangerous conditions for them. If dogs, in their exuberance, jump on a frail older adult causing them to fall, serious injury can result. One such instance was reported by an interviewee,

resulting in an elderly female breaking her hip due to a conflict with a dog unrestrained by an owner (see excerpt page 157).

Policies are typically in place that require control of dogs in public places, yet not all owners follow instructions. Alternatives to simple sign-posting could involve the presence of park rangers, on-the-spot fines, or specific timeframes for dog-related activities. Another option would be to construct a fenced enclosure where dogs may run free. These are known as 'off-the-leash' dog parks (See Figure 19 below) and have been used with some measure of success, ensuring that conflicts between dogs and older adults are minimized.

***Shared-Use Paths.*** Interviewees clearly indicated the dangers associated with shared-use or multi-use paths for older adults. Limitations in older adults relating to sight, hearing and physical agility all contribute to the dangers of these paths, where sight and hearing are crucial to warn of approaching cyclists, and physical agility is required in some cases to withdraw from the path of a speeding cyclist. As indicated in the 'Interview Analysis and Results' chapter, research

***Figure 19:*** *'Off-the-leash' Dog Park – fenced to reduce conflict with older adults.*

Very busy dog park [Online Image]. Retrieved November 26, 2016

conducted across Australia has indicated these issues, yet little has been done to mitigate the risks for pedestrians and cyclists alike.

Solutions to this dilemma can be addressed by both policy and design and span both community planning and transportation planning sectors. I had indicated in the previous chapter that the increase from 172 km to 850 km of shared-use paths over the next thirty five years is an initiative of the State Government Department of Main Roads. Similar levels of jurisdiction are active in other states around Australia regarding the implementation of these transportation modes. Thus, policy recommendations at the Federal or State level of jurisdiction would be appropriate in Australia to ensure that these hazardous amenities are redesigned for safety. Even at the local level, policy and physical planning initiatives would be appropriate to mitigate potential negative outcomes. Policy amendments to City transportation codes would be appropriate in endorsing alternatives exhibited in Figures 20, 21, 22, and 23 below.

***Figure 20:*** *Separation of pedestrian and cycle modes using painted lines*
Chilco Street Separated Path [Online Image]. Retrieved November 26, 2016

***Figure 21:*** *Physical separation of pedestrian and cycle modes onto independent paths*

The path along the Lac St. Louis Waterfront in Lachine [Online Image]. Retrieved November 26, 2016

***Figure 22:*** *Indicative uses communicated through diverse paving colors and treatments*

[Untitled image of separated bike and pedestrian uses]. Retrieved November 26, 2016

***Figure 23:*** *Physical separation of pedestrian and cycle modes via concrete curbing.*
Cycle path along the north side of the river into the city [Online Image]. Retrieved November 26, 2016

**Design.** As previously noted, design elements relate primarily to amenities found within the boundaries of a park or open space, intended to cater to the presence and comfort of visitors. The following sections elaborate on specific design initiatives suggested by the findings of this research that would positively impact the older adults' experience of open space, increasing fulfilment of autonomy, competence, and relatedness needs, and increasing rates of visitation.

***Park Bench Seating.*** The interview findings addressing park seating have direct implications for design. For example, one male interviewee expressed difficulty in his ability to move due to hip and knee problems and quoted:

> *"And it'd be all right for kids but I tell you, I sit down, I have a job to get out of it, the bench seat has gone so low"* Male, England, age 86. (See page 142 for full excerpt).

This prohibited him from going to the park on his own, reducing his fulfilment of autonomy needs. This circumstance is not unlike those afflicting many older adults. Upon visual inspection of the park seating by the researcher, this interviewee's ability to get out of the park seating was directly correlated with the shape of the seat, the height of the seat, and his upper body strength in lifting himself off the seat to a standing position. Figure 24 below graphically illustrates this dilemma.

Australian Design Standards AS1428.1 provides standard dimensions for design of public seating, which is generally indicated as 450mm above adjacent ground level. In response, advisory notes issued by the Australian Human Rights Commission under section 67(1)(k) of the Disability Discrimination Act 1992, notes the following:

> *5.2.7 Note that the needs of ambulant people with mobility disabilities who require public seating higher than the general 450 mm should also be addressed. See Note 1 in AS 1428.2 Clause 27.2 which refers to a height of 520 mm.*

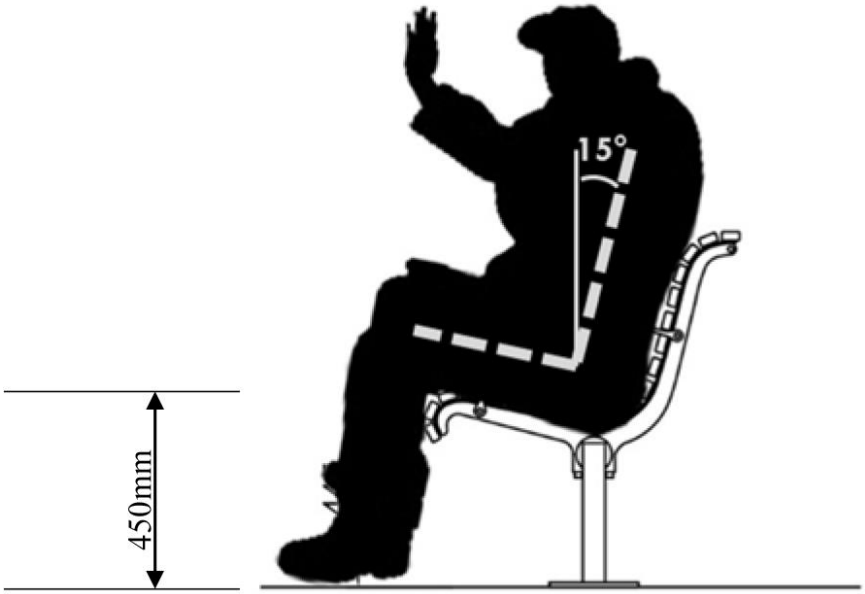



***Figure 24:*** *Older Adult posture on typical park bench seating*

As indicated, the standard seat height of a public park bench in Australia is 450mm. In fact, many furniture manufacturers in Australia design and manufacture public bench seating at this standard 450mm height. Unfortunately, as noted in the interview excerpt above, this standard height restricts access and use by individuals with physical deficiencies or disabilities such as those described. The recommendation made by the Australian Human Rights Commission acknowledges the physical limitations experienced by some, and therefore supports a redesign of public park bench seating to afford greater access to open space.

Thus, the interview analysis suggests an opportunity for redesign of both the height and shape as shown in Figure 25 below. The redesign of both the height and the seat shape adjusts the older adult's posture to a more upright position. For the older adults with physical limitations, this is more conducive to being able to lift themselves from the park bench seating on their own. Importantly, doing so, enables the fulfilment of their needs for autonomy, and as both the quantitative and qualitative results showed, this in turn, will increase the likelihood of revisitation to the open space in the future.


***Figure 25:*** *Adjusted seating design catering to the older adult posture*

***Walking Paths.*** More than three quarters of the interviewees participating in this project indicated walking as their preferred activity. In addition, about half of those interviewees indicated difficulty in walking because of a combination of physical limitations due to age and difficulty in navigating the walkways provided in open spaces. These difficulties arose from changes in textures or materials of the walkway, undulating walkways due to changes in topography, or walkways that were broken, cracked or heaving from tree roots or similar physical disturbances.

Interview analysis and results indicated determination on the part of some interviewees to persevere regardless of the difficulties they were experiencing (refer excerpt page 143). Yet, the analysis also revealed the limited ability of many older adults to truly overcome these obstacles, particularly in cases of severe physical limitations. Regardless of the severity of the limitation,

there will always be an opportunity for open space planners and designers to mitigate the lack of access and use capabilities of the individual. Planning and design consideration may be applied to the built environment in these circumstances to provide opportunities for path design and origin/destination considerations. Doing so is likely to help fulfil needs for autonomy and competence, and in turn, these considerations can potentially yield greater access and use opportunities and, therefore, increased visitation rates for older adults in line with national recommended activity rates of 30 minutes per day.

For example, an awareness of topography is crucial to consider if designing for older adults. A single park location can afford both undulating or hilly walking paths as well as those restricted to within 5% gradients for the benefit of older adults with mobility difficulties. Further, a single simple material (e.g. concrete) that will provide an even texture for the length of the path is crucial to reducing trip zones and maintenance issues as the path ages. In order for older adults to fulfil their needs for autonomy and for competence, consideration must be given toward walking surfaces that are even and regular (See Figures 26, 27, & 28 below). These even surfaces contribute strongly toward fulfilling the need for autonomy, because when surfaces are even and regular, the older adults have the opportunity to not only take on the challenge of a walk, but to do so by themselves, with a walking stick or walker if needed.

***Figure 26:*** *Potential trip hazard for older adults - varying materials and textures in paving.*

South Perth Foreshore 2005-03-30 [Online Image] (2005). Retrieved November 26, 2016

***Figure 27:*** *Potential trip hazard for older adults – change in paving materials.*

[Untitled image of separated bike and pedestrian path]. Retrieved November 26, 2016

***Figure 28:*** *Hazard-free paving for older adults – single, uniform material.*
[Untitled image of smooth pedestrian path]. Retrieved November 26, 2016

Not only can these initiatives be implemented by, for example, landscape architects in the final design of a park, but can also be written into design guidelines provided by planners and developers.

***Children's Playgrounds.*** Approximately half the interviewees participating in this research indicated a love for young children and the enjoyment they experience in watching their grandchildren (or any children) play at the playground. As noted in the excerpt on page 149, older adults also recognize the benefit to young children being present at parks as there are always adults with them, affording a more secure environment for the older adult. Yet, playgrounds typically have very little seating provided for adults as, presumably, the emphasis is

on the play structure and the children's activity, not that of the adults, demonstrating lack of consideration for this age group (See figure 29 below).

Consideration in planning and design, based on this finding, would suggest accompanying children's playgrounds with ample quantity and appropriate design of seating and walking opportunities for older adults in proximity to each other. Currently, quantity of seating adjacent to playground areas is inadequate, as referenced by many interviewees and survey respondents. This frequently prevents older adults from enjoying the space alongside children, which clearly is important to enable them to fulfil needs to autonomy, and may also help to fulfil needs for relatedness.

***Figure 29:*** *Children's playground with no seating amenity for older (or younger) adults.*
[Untitled image of Shaded Children's Play Structure]. Retrieved November 26, 2016

### iii. Limitations and Future Research

Delving into the lived experiences of social groups is a complex undertaking. Regardless of the approach one takes, there will always be limitations to that approach, some aspects of that lived experience might be overlooked, or a perspective may be taken by the researcher that doesn't completely map onto the reality of the researched group.

The research undertaken here is a first step in built environment research into understanding the lived experience of a distinct social group and developing practical outcomes that can directly impact future generations of members of this group. More research is necessary to complement this research and also address its limitations.

For example, although my survey sample canvassed the entire country of Australia, choosing to conduct the interview portion of the research in one city (Perth - population approximately 2.02 million) implies the qualitative findings are primarily applicable to urban areas of similar size and demographic composition. This would have been mitigated somewhat by a comparison site of larger population, for example, Sydney (population approximately 5.25 million). Future research should include additional locations within Australia for comparison purposes. Additionally, comparative data analysis between Australian cities and similar sized cities in the U.S., Europe, Asia, or the Middle East would be a welcome extension of this research. Comparisons between urban and rural locations and different socio-cultural settings would afford different understandings of the lived experiences of older adults.

The focus of this study was on older adults, yet some of the same needs might apply to other demographic groups. Thus, future research involving other age categories (including smaller age increments in the older adult category, for example, 65-74, 75-84, and 85+) can

reveal similarities and differences in these subgroups' needs. Interview analysis in this study only just began to uncover potentially substantial differences across these three age categories; differences that are worth exploring further as the population is now living past previously anticipated ages. Further, comparisons between older adults and younger adults is an obvious next step, as would comparisons of adults and children.

Age was the demographic characteristic highlighted in this dissertation. This demographic is often overlooked in many studies that tend to focus on wage-earners or people of child-bearing age. By focusing specifically on older adults, I was able to probe into their experience, particularly in the interview portion of the study. In future research, I hope to "drill deeper" into the differentiated experiences among older adults, since this demographic is not a homogenous group. This additional level of analysis across other demographic characteristics presents valuable opportunities to further this research toward a deeper comprehension of the older adult experience.

In this regard, the study indicated some interesting gender differentiation. Even after controlling for gender and country of origin, age explained significant variance in the importance of the need for autonomy. However, gender also explained a significant proportion of the variance in the importance of the need for autonomy. The importance of this need across the population as a whole (both under 65 and 65 and over) was significantly greater for females than males. Yet, when the sample was divided based on age, there was no significant difference between genders for adults under 65, yet the difference between genders was significant for adults aged 65 and over, with females indicating a higher need for autonomy than males in the older age group.

Fulfilment of the need for autonomy was the single motivational variable that predicted the most variance in likelihood of revisitation. The fact that need for autonomy is even more pronounced for women in the 65 and over age group suggests that ensuring fulfilment of the need for autonomy is particularly important in encouraging revisitation in women 65 and over. The elements that were related to the fulfilment of autonomy were different for women than for men. For women, autonomy was fulfilled through elements of the community and the natural environment. For men, it was convenience and natural environment. This suggests that to make parks more appealing to women aged 65 and over it is important to locate parks within communities. Doing so helps to fulfil their needs for autonomy as they will likely feel more able to visit the park on their own. Future research is needed to determine the extent to which planning and designing for women (in particular women aged 65 and over) can help to accomplish larger societal goals or interests. For example, amongst indigenous communities, women hold a special role over the economic and social well-being of the community as they are often the default head of the family. The indigenous population is shrinking and hence the reason for the scant representation in this national sample. However, a study focused specifically on indigenous communities and the empowerment of women through design and policy would be well worth the effort. Employing community engagement within indigenous communities has demonstrated strong effects on empowerment (Gibson and Grabasch, 2011).

Subsequent work might venture forth into the realm of various social groups, such as the comparative nature of lived experiences in the built environment of immigrants versus those living in their home country, perspectives from indigenous individuals in contrast to non-indigenous, homosexual versus heterosexual experiences in open space, able-bodied and able-minded versus disabled bodied and cognitively disabled, etc. As an example, issues relating to

country of origin should be investigated further in future research. This study primarily employed retirement villages as the geographic context for interviewees. However, it is likely that retirement villages tend to attract more individuals from certain cultures and nationalities. Therefore, future research should take place in different settings to include individuals from different countries of origin. Most non-Australian-born interviewees were from England, New Zealand, Canada, and Ireland, all of which are similar Commonwealth countries to Australia or, in the case of Ireland, having similar cultural norms. This resulted in homogeneity in response to questions and reduced observations regarding differences between native-born and foreign-born interviewees.

This study utilized a mixed-methods research design, including both surveys and interviews. While this is a strength, as it affords triangulation, additional precision, and insight (e.g. Johnson et al. 2007; Creswell & Plano Clark, 2011), alternative methodologies would be also interesting to pursue. For example, design charrettes involving representatives from various social groups designing what they believe to be appropriate for themselves would yield perhaps deeper design-based results, as it would involve graphic outputs and analysis of images.

## Conclusion

Our cities, towns, and villages feature parks and open spaces, purposefully built for our combined enjoyment. I commenced the dissertation journey by questioning the adage, "If you build it, they will come." Based on the findings of this research, I propose a revision of the adage; a change in the relationship between the parties in the quote. If you build it ***with them***, they will come. This amendment still provides the same outcome, but changes the process

through which the outcome is generated. ‘Build it ***with them***’ implies a joint contribution to the process, and importantly yields a better joint outcome; one that is guided by the hand of a professional, yet also guided by the hand of the user. This simple combination of professional know-how and local knowledge has the potential to improve need fulfilment and increase visitation to open space, and in doing so, enhance the lives of people in the process.

# APPENDIX A

## INTERVIEW PROTOCOL

### Interview Protocol Background

The following interview protocol will be administered to individuals in Perth, Australia, who are over the age of 65, asking their responses to questions relating to a specific park visit they've had, what will make them want to revisit the park again, and how they generally feel about parks. The three interview foci sections are noted below:

***Interview Focus 1*** *– Exploration of the aspects of open space experiences of older adult individuals influencing their perceptions of appropriateness of location, amenities, and programs, fulfillment of their needs, and perceptions of intent to engage in repeat visitation to the park.*
***Interview Focus 2 –*** *Exploration of the motivations experienced by the individual in their intent to revisit the open space location, the perceived influences encouraging their motivation to revisit, and the perception of fulfillment of needs resulting from a repeat visit.*
***Interview Focus 3 –*** *Exploration of any lack of desire for revisit (or refusal for initial attendance) at open space locations, to derive responses informing what interviewees believe can be done to change their visitation patterns, and ways in which open space provision, design, and programs can be revised to increase their motivation to visit open space again.*

### Interview Protocol

***1. Details of a Recent Park Visit***

a. I'd like you to think back to the most recent time that you enjoyed your visit to a park.

i. Please tell me about that visit. Possible probe questions include:

- When was this?
- Was this your first visit to this park or had you been there before?
- How often do you normally go to this park?
- Why did you go?
- Which park did you go to? How did you get there?
- Did you go alone or were you with someone?
- Did you meet up with other people while you were there?
- What did you do once you arrived at the park?
- How long did you stay there?
- What did you like about the visit?

ii. I'd like you to tell me about the amenities at the park that interest you. Possible probe questions include:

- What do you think are the best features of the park?
- What kind of other amenities are at the park that don't interest you?
- Does the park run any programs that you know about or are interested in participating in (afternoon teas, picnics, nature walks)?

iii. Tell me about how this experience at the park made you feel. Possible probe questions include:
- Was there anything in particular that happened to you on that day?
- Was there anything or anyone at the park that made it a good visit?
- What would be the things about this visit that would make you want to visit that park again?

b. Now, I'd like you to think of a time you visited a park and didn't like it.

i. Please tell me about that visit. Possible probe questions include:
- When was this?
- Why did you go?
- Which park did you go to? How did you get there?
- Did you go alone or were you with someone?
- Did you meet up with other people while you were there?
- What did you do once you arrived at the park?
- How long did you stay there?
- What did you dislike about the visit?

ii. Tell me about the amenities at the park that were not of interest you. Possible probe questions include:
- What do you think are the worst features of the park?
- What kind of other amenities are at the park that don't like?
- Does the park run any programs that you know about that you are not at all interested in participating in?

iii. Tell me about how this experience made you feel. Possible probe questions include:
- Was there anything in particular that happened to you on that day to make it a bad experience?
- Was there anything or anyone at the park that made you uncomfortable or want to leave?

- Do you feel there are things that could have been done to make this visit more enjoyable for you?

***2. General Park Use***

a. I'd like you to think about your visits to parks in general.
    i. Tell me about how you normally use parks. Possible probe questions include:
        - How often do you normally visit parks?
        - Tell me a bit about the kinds of parks you normally like to go to.
        - What kinds of activities do you usually like to engage in while you're at the park?
        - How do you think other people like yourself would enjoy these same kinds of features or activities?
        - What other activities would you like to be involved in if they were offered at a park?
        - Are there things that are stopping you from engaging in these kinds of activities?
        - How do you normally get to a park? Does it take long?
        - Do you normally visit parks alone or with other people/pets (friends, grandchildren, dog, etc.)?
        - How long do you normally like to stay at the park?

b. What kinds of things would stop you from wanting to visit a park?
    i. Tell me about these things and how and why they make you not want to visit a park. Possible probe questions include:
        - Are these things something about the park (broken benches or footpaths) or about other people at the park (e.g. bikers, skateboarders, loud children)?
        - Tell me about whether these same kinds of issues are at only one park or at most of the parks you visit?
        - Do you see that there is anything that can be done to make these issues better for you?
        - Do you talk about these issues with your friends and do they feel the same way? What do they say about it?

***3. Background information - Demographics***

a. What is your age?
b. In which country were you born?
c. What is your native language?
d. How many languages do you speak fluently?

e. What is the highest level of education you have achieved?
f. Have you lived in a foreign country? How many? Which one(s)?
g. For how long did you live in each of those countries?
h. In which country(s) are you a citizen or a permanent resident?
i. Most people feel closest to the culture of the country in which they were born. Some people feel closer to the country in which they have lived longest or in which they live now. Still other people feel closer to a culture that is associated with a region, a religion, or some other social group. Which culture do you feel closest to and why?

***4. Is there anything else you'd like to add or any other thoughts you want to share before we conclude the interview?***

***5. Thank you for your time.***

# APPENDIX B

## INTERVIEW RECRUITMENT LETTER

### UNIVERSITY OF CALIFORNIA, LOS ANGELES
### Recruitment Letter (Interview)

**Subject: Research on access to urban open space by older adults in Perth, Australia - Request to participate in a study interview.**

Dear Sir/Madam,

Stephen Gibson, an Australian student currently undertaking study towards his PhD at the Luskin School of Public Affairs at the University of California, Los Angeles (UCLA) is conducting a research study to learn ways in which older adults access urban open spaces and parks in Perth, Australia, to identify ways in which older adults have difficulty accessing these spaces, and to generate ways in which this access can be improved. Stephen is particularly interested in personal opinions and individual experiences.

The research is expected to suggest potential strategies for change to planning, design, and management of open spaces so that older adults will directly benefit from the changes. You have been selected as a possible participant in this study because of your experiences with open space in Perth.

If you volunteer to participate in this study, you will be asked to participate in an interview with the researcher. The interviewer will ask you questions that will encourage you to talk about 1.) what you liked about a certain open space location, 2.) whatyou didn't like about a certain open space location, and 3.) thoughts you may have about ways to make open space more appealing to you. The interview will take about an hour to complete.

I hope you will consider assisting me in this incredibly important research.

Thank You!

Sincerely,

Stephen Gibson

PS. A Study Information Sheet, which summarizes the research and notes your rights, will be given to you prior to the interview. Any information that is obtained in connection with this study and that can identify you will remain confidential. It will be disclosed only with your permission or as required by law. If you have any questions, comments or concerns about the research, you can contact me at any time.

Stephen Gibson
PhD Program
Department of Urban Planning
UCLA Luskin School of Public Affairs
Phone: 0417 066 363

# APPENDIX C

## SURVEY QUESTIONS

❍ I consent to participating in this study (1)
❍ I do not consent to participating in this study (2)

**Q1preInfo**

What is important in your life? First, we want to ask you about the things that are important in your life.

**Q1 - Q1**

Q1. Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is important to you.

| | 1<br>Not at all important (1) | 2<br>A little important (2) | 3<br>Moderately important (3) | 4<br>Quite important (4) | 5<br>Very important (5) |
|---|---|---|---|---|---|
| Being able to decide for myself how to live my life. (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Completing something in my own way. (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Doing activities that I want to do. (3) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Being free from pressure to do things others want me to do. (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Feeling competent at the things I do. (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Succeeding with activities that are difficult. (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Mastering any challenges. (7) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Doing well even at the hard activities. (8) | ❍ | ❍ | ❍ | ❍ | ❍ |
| A sense of contact with other people. (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Feeling close with other people in general. (10) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Being connected with other people in general. (11) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Experiencing a sense of belonging with other people. (12) | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q2 - Q2**

Q2. Generally speaking how often do you visit parks? (this includes reserves, playgrounds, ovals, national parks, public green spaces, etc.)

| | Less than 12 times per year (1) | Every month (2) | Fortnightly (3) | Weekly (4) | Daily (5) |
|---|---|---|---|---|---|
| (1) | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q3preInfo**

Why do you go to a park? Please think about when you go to parks. We want to understand more about why you would or would not put effort into going to a park.

**Q3 - Q3**

Q3. Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you at this point in your life.

| | 1<br>Not at all true (1) | 2<br>A little true (2) | 3<br>Moderately true (3) | 4<br>Quite true (4) | 5<br>Completely true (5) |
|---|---|---|---|---|---|
| I tend to visit a park because I enjoy it. (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend to visit a park because it is exciting to me. (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend to visit a park because it interests me. (3) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend to visit a park to gain the approval of others. (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend to visit a park because I want to gain the respect of others. (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend to visit a park to avoid being criticized by others. (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend not to visit parks because I feel that it is a waste of time. (7) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend not to visit parks because I don't feel it's worth putting effort into. (8) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I tend not to visit parks because going to a park is pointless. (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to be able to decide for myself how to spend my time. (10) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to be free from pressure to do what others want me to do. (11) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to be able to do things in my own way. (12) | ❍ | ❍ | ❍ | ❍ | ❍ |

| | 1<br>Not at all true (1) | 2<br>A little true (2) | 3<br>Moderately true (3) | 4<br>Quite true (4) | 5<br>Completely true (5) |
|---|---|---|---|---|---|
| I visit a park because I want to feel competent at the park activities I do. (13) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to succeed at difficult or challenging park activities. (14) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to master any challenges I face. (15) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to experience a sense of contact with other people. (16) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to be connected to other people in general. (17) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to experience a sense of belonging with other people. (18) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to reduce pressure from others in my life (19) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park so I don't have to do what I am told (20) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to sense choice and freedom in the things I undertake (21) | ❍ | ❍ | ❍ | ❍ | ❍ |
| I visit a park because I want to reduce the obligations in my daily life (22) | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q4preInfo**

Tell us about a park experience

Now, we ask you about your actual experiences with certain park elements and the way in which that interaction made you feel.

**Q4 - Q4**

Think of your most recent visit to a park. Please provide the name of that park and a brief description of it below.

Name and Location of Park (1) _____
Brief Description (2) _____

**Q5a - Q5a**

Q5a. Generally speaking, how satisfied were you with your visit to this park?

| | | | | |
|---|---|---|---|---|
| ❍ Not at all satisfied<br>1 (1) | ❍ A little satisfied<br>2 (2) | ❍ Moderately satisfied<br>3 (3) | ❍ Quite satisfied<br>4 (4) | ❍ Completely satisfied<br>5 (5) |

**Q5b - Q5b**

Q5b. Why do you say that?

(1) _____

**Q6preInfo**

What was your satisfaction based on?

**Q6 - Q6**

Q6. Please read each of the following statements carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you on this occasion.

Visiting the park allowed me to...

| | 1<br>Not at all true (1) | 2<br>A little true (2) | 3<br>Moderately true (3) | 4<br>Quite true (4) | 5<br>Completely true (5) |
|---|---|---|---|---|---|
| ...decide for myself how to spend my time. (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...be free from pressure to do things others want me to do. (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...do things in my own way. (3) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...be myself in a regular setting. (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...feel competent at the park activities I do. (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...succeed with park activities that I find difficult or challenging. (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...master any challenges. (7) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...do well, even at the hard activities. (8) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...experience a sense of contact with other people. (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...feel close with other people in general. (10) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...be connected with other people in general. (11) | ❍ | ❍ | ❍ | ❍ | ❍ |
| ...experience a sense of belonging with other people. (12) | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q7aQ7aiiInfo**

Aspects of Park Location

The following questions ask about various aspects of the Park Location. For each aspect, please indicate whether or not this was true for the Park you visited, and also how important this aspect was in terms how much you enjoyed your experience at the park.

**Q7aInfo01**

Aspects of Park Location:

**Q7a01**

Q7a. Please indicate the degree to which this aspect was true for the park you visited.

| | 1 Not at all true (1) | 2 A little true (2) | 3 Moderately true (3) | 4 Quite true (4) | 5 Completely true (5) |
|---|---|---|---|---|---|
| The park location was close to my home. (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park location was close to public transport (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was In a safe neighbourhood (3) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was safe (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was accessible to me on foot (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was not isolated away from other homes and people (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was relatively flat and not hilly (7) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was in full public view, not visually secluded (8) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The surrounding community was of a similar race or ethnicity to mine (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The surrounding community was of a similar social class to mine (10) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was within easy driving distance from my home (11) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had a clearly marked entrance (12) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park provided convenient car parking facilities (13) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park was close to other homes and neighbourhoods (14) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had enough other visitors to make it feel safe (15) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had safe access free from traffic or vehicle hazard (16) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The surrounding community appeared to be of a similar stage of life (age group) to mine (17) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park appeared to be important to the surrounding community (18) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had a strong community atmosphere (19) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The surrounding community felt comfortable and welcoming (20) | ❍ | ❍ | ❍ | ❍ | ❍ |

**q7b - q7b**

Q7b. In addition to those mentioned, are there any other aspects of the park location that you can think of?

❍ Yes (1)
❍ No (2)

**q7c - q7c**

Q7c. Please list other aspects of park location in the box below and rate your experience.

*Please specify each location aspect in a separate row, starting from the top. You may leave some rows blank*

| | 1<br>Very negative<br>(1) | 2<br>A little negative<br>(2) | 3<br>Neutral<br>(3) | 4<br>A little positive<br>(4) | 5<br>Very positive<br>(5) |
|---|---|---|---|---|---|
| (98)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |
| (97)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |
| (96)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |
| (95)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q7dQ7diiInfo**

Aspects of Park Amenities: The following questions ask about various aspects of the Park Amenities. For each aspect, please indicate whether or not this was true for the Park you visited, and also how important this aspect was in terms how much you enjoyed your experience at the park.

**Q7dInfo01**

Aspects of Park Amenities:

**Q7d01**

Q7d. Please indicate the degree to which this aspect was true for the park you visited.

| | 1<br>Not at all true (1) | 2<br>A little true (2) | 3<br>Moderately true (3) | 4<br>Quite true (4) | 5<br>Completely true (5) |
|---|---|---|---|---|---|
| The park had easy-to-read signage (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had relatively flat walking paths (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There was shade at the park (3) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had comfortable seating (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There were nice views at the park (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had water features, such as lakes, streams, or fountains (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There were clean toilets / restrooms at the park (7) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There was convenient parking available at the park (8) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had exercise equipment (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There were good quality trees, shrubs, and other vegetation at the park (10) | ❍ | ❍ | ❍ | ❍ | ❍ |

| | 1<br>Not at all true (1) | 2<br>A little true (2) | 3<br>Moderately true (3) | 4<br>Quite true (4) | 5<br>Completely true (5) |
|---|---|---|---|---|---|
| There was wildlife at the park (11) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There were gardens and flowers at the park (12) | ❍ | ❍ | ❍ | ❍ | ❍ |
| There were sports ovals at the park (13) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had enough drinking fountains (14) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had safe multi-use walking and bicycling paths (15) | ❍ | ❍ | ❍ | ❍ | ❍ |
| The park had separate paths for walking and bicycling (16) | ❍ | ❍ | ❍ | ❍ | ❍ |

**q7e - q7e**

Q7e. In addition to those mentioned, are there any other aspects of park amenities that you can think of?

❍ Yes (1)
❍ No (2)

**q7f - q7f**

Q7f. Please list other aspects of park amenities in the box below and rate your experience.

*Please specify each amenity aspect in a separate row, starting from the top. You may leave some rows blank*

| | 1<br>Very negative (1) | 2<br>A little negative (2) | 3<br>Neutral (3) | 4<br>A little positive (4) | 5<br>Very positive (5) |
|---|---|---|---|---|---|
| (98)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |
| (97)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |
| (96)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |
| (95)_____ | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q8**

Q8. Overall, what is the likelihood that you will visit this park again?

| | 1<br>I WILL NOT visit this park again (1) | 2<br>  (2) | 3<br>I MAY visit this park again (3) | 4<br>  (4) | 5<br>I WILL visit this park again (5) |
|---|---|---|---|---|---|
| (1) | ❍ | ❍ | ❍ | ❍ | ❍ |

**Q9**

Q9. Please list other things that you remember about your visit that you enjoyed or did not enjoy?

Other things you remember about your visit that you enjoyed (1) _____
Other things you remember about your visit that you did not enjoy (2) _____

**Q10preInfo**

Tell us more about yourself

**Q10 - Q10**

Q10. What is your age?

- ❍ 17 years of age and under (99)
- ❍ 18 - 24 (1)
- ❍ 25 - 29 (2)
- ❍ 30 - 34 (3)
- ❍ 35 – 39 (4)
- ❍ 40 - 44 (5)
- ❍ 45 – 49 (6)
- ❍ 50 – 54 (7)
- ❍ 55 – 59 (8)
- ❍ 60 – 64 (9)
- ❍ 65 - 69 (10)
- ❍ 70 – 74 (11)
- ❍ 75 – 79 (12)
- ❍ 80 – 84 (13)
- ❍ 85 and over (14)

**Q11 - Q11**

Q11. And are you male or female?

- ❍ Male (1)
- ❍ Female (2)

**Q12**

Q12a. In which country were you born?

Q12b. And what is your native language?

Country of birth: (a) _____
Native language: (b) _____

**Q13 - Q13**

Q13. How many languages do you speak fluently (including your native language)?

- ❍ One (1)
- ❍ Two (2)
- ❍ Three (3)
- ❍ Four (4)

❍ Five or more (5)

**Q14 - Q14**

Q14. What's the highest level of education you have completed?

❍ Secondary or high school (or less) (1)
❍ Some university coursework (including 2-year degrees) (2)
❍ Completed Bachelor's degree (e.g., B.A./B.S.) (3)
❍ Completed Masters level degree (e.g., M.A./M.S., MBA) (4)
❍ Completed Doctoral degree (e.g., PhD, JD, MD) (5)
❍ Other (6)

**Q15 – Q15**

Q15. Do you currently work in a paid position or a volunteer position?

❍ Full-time Paid (1)
❍ Part-time Paid (2)
❍ Volunteer, unpaid (3)
❍ Retired and not looking for paid or volunteer employment (4)
❍ Retired and looking for paid or volunteer employment (5)
❍ Unemployed and not looking for paid or volunteer employment (6)
❍ Unemployed and looking for paid or volunteer employment (7)

**Q16 – Q16**

Q16. What is your average weekly gross individual income?

❍ Nil (1)
❍ $1 - $199 (2)
❍ $200 - $299 (3)
❍ $300 - $399 (4)
❍ $400 - $599 (5)
❍ $600 - $799 (6)
❍ $800 - $999 (7)
❍ $1,000 - $1,249 (8)
❍ $1,250 – 1,499 (9)
❍ $1,500- $1,999 (10)
❍ $2,000 or more (11)

**Q17 – Q17**

Q17. Do you have children?

❍ Yes (1)
❍ No (2)

**Q17b – Q17b**

Q17b. How many children do you have?

❍ One (1)
❍ Two (2)
❍ Three (3)
❍ Four (4)
❍ Five (5)
❍ Six (6)
❍ Seven (or more) (7)

**Q18 – Q18**

Q18. Please list their ages and indicate whether they are boys or girls.

| | | Q18b - Gender | |
|---|---|---|---|
| | Q25a - Age (in whole years) | Male (1) | Female (2) |
| 1st child (1) | _____ | ❍ | ❍ |
| 2nd child (2) | _____ | ❍ | ❍ |
| 3rd child (3) | _____ | ❍ | ❍ |
| 4th child (4) | _____ | ❍ | ❍ |
| 5th child (5) | _____ | ❍ | ❍ |
| 6th child (6) | _____ | ❍ | ❍ |
| 7th child (7) | _____ | ❍ | ❍ |

**Q19 – Q19**

Q19. Do you have grandchildren?

❍ Yes (1)
❍ No (2)

**Q19b – Q19b**

Q19b. How many grandchildren do you have?

❍ One (1)
❍ Two (2)
❍ Three (3)
❍ Four (4)
❍ Five (5)
❍ Six (6)
❍ Seven (or more) (7)

**Q20 - Q20**

Q20. Please list the ages of your grandchildren and indicate whether they are boys or girls.

| | Q25a - Age (in whole years) | Q20b - Gender | |
|---|---|---|---|
| | | Male (1) | Female (2) |
| 1st grandchild (1) | _____ | ❍ | ❍ |
| 2nd grandchild (2) | _____ | ❍ | ❍ |
| 3rd grandchild (3) | _____ | ❍ | ❍ |
| 4th grandchild (4) | _____ | ❍ | ❍ |
| 5th grandchild (5) | _____ | ❍ | ❍ |
| 6th grandchild (6) | _____ | ❍ | ❍ |
| 7th grandchild (7) | _____ | ❍ | ❍ |

**Q21 - Q21**

Q21. In how many foreign countries have you lived?

❍ None - always lived in Australia (0)
❍ One (1)
❍ Two (2)
❍ Three (3)
❍ Four (4)
❍ Five (5)
❍ Six (6)
❍ Seven or more (7)

**Q22 - Q22**

Q22. In total, how many years have you lived outside your home country?

❍ Never lived outside Australia (0)
❍ One year or less (1)
❍ Two (2)
❍ Three (3)
❍ Four (4)
❍ Five (5)
❍ Six (6)
❍ Seven or more (7)

**Q23**

Q23. Of which country are you a citizen (or permanent resident)?

Citizen / Permanent resident of: (1) _____

**Q24**

Q24. In which countries have you lived for one year or longer?

Countries lived in: (1) _____

STOP

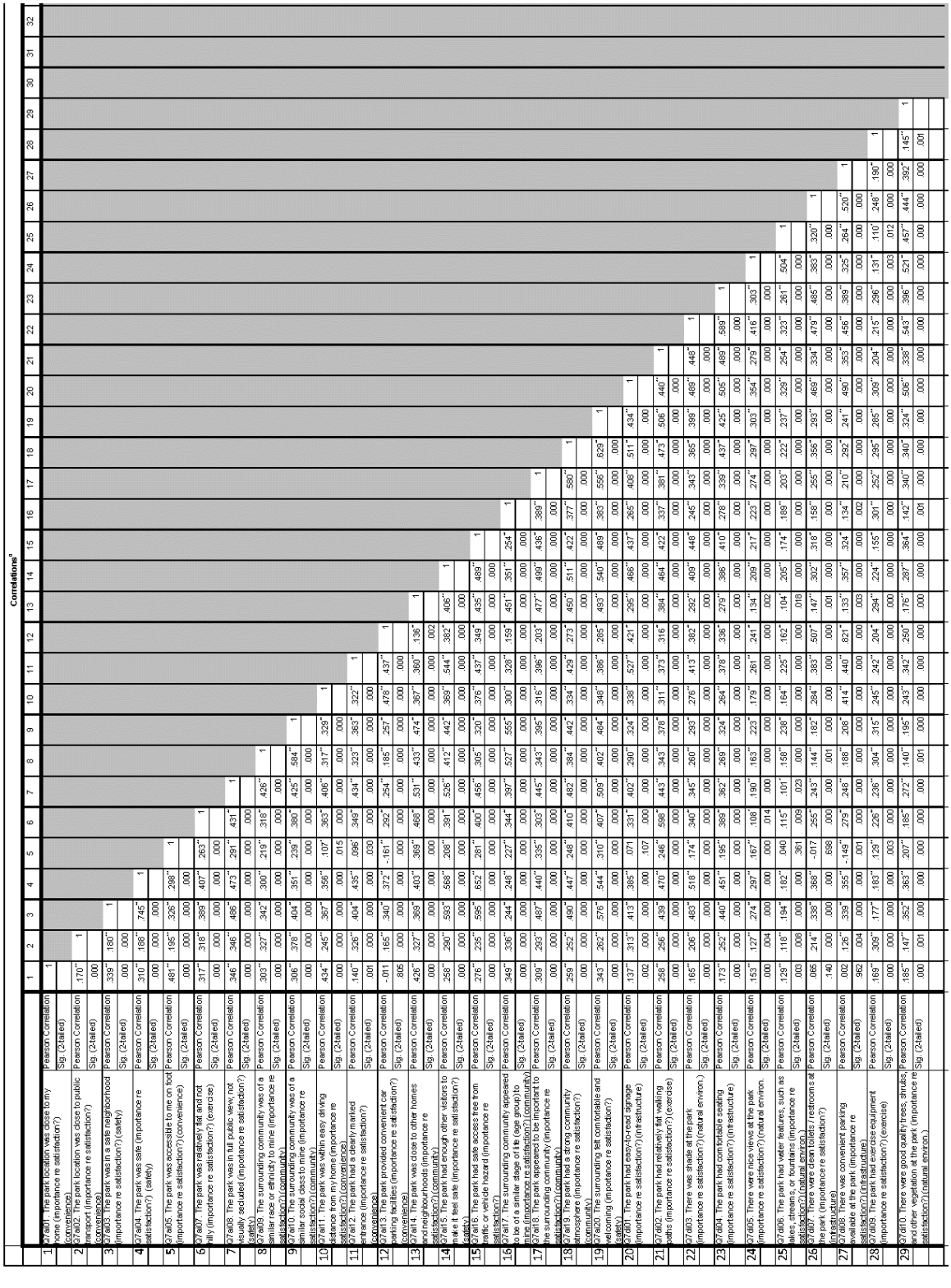
**Complete –**

*This concludes the survey. Thank you very much for your valuable time and feedback.*

*Please close the browser to submit the survey.*

# APPENDIX D

PAIRWISE CORRELATION TABLE – ALL ITEMS PLUS SIGNIFICANCE AND SCALES



**Correlations[c]**

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | Q7di11. There was wildlife at the park (importance re satisfaction?) (natural environ.) | Pearson Correlation | .151** | .068 | .096 | .093* | .132** | .053 | .076 | .116** | .190** | .194** | .170** | .064 | .146** | .123** | .117** | .141** | .179** | .147** | .177** | .274** | .077 | .236** | .175** | .402** | .506** | .161** | .180** | .094* | .432** | 1 | | | | | |
| | | Sig. (2-tailed) | .001 | .127 | .029 | .036 | .003 | .234 | .086 | .009 | .000 | .000 | .000 | .150 | .001 | .005 | .008 | .001 | .000 | .001 | .000 | .000 | .081 | .000 | .000 | .000 | .000 | .000 | .000 | .034 | .000 | | | | | | |
| 31 | Q7di12. There were gardens and flowers at the park (importance re satisfaction?) (natural environ) | Pearson Correlation | .054 | .223** | .277** | .299** | .113* | .139** | .207** | .246** | .260** | .180** | .236** | .249** | .184** | .315** | .240** | .267** | .257** | .304** | .319** | .407** | .351** | .400** | .414** | .398** | .441** | .374** | .271** | .239** | .485** | .219** | 1 | | | | |
| | | Sig. (2-tailed) | .218 | .000 | .000 | .000 | .010 | .002 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | | | | |
| 32 | Q7di013. There were sports ovals at the park (importance re satisfaction?) (exercise) | Pearson Correlation | .108* | .310** | .165** | .126** | .071 | .198** | .250** | .255** | .316** | .235** | .330** | .210** | .271** | .278** | .141** | .323** | .242** | .279** | .206** | .232** | .182** | .144** | .179** | .062 | .086 | .250** | .220** | .379** | .070 | .112* | .163** | 1 | | | |
| | | Sig. (2-tailed) | .014 | .000 | .000 | .004 | .108 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .001 | .000 | .000 | .000 | .000 | .000 | .000 | .001 | .000 | .163 | .053 | .000 | .000 | .000 | .115 | .011 | .000 | | | | |
| 33 | Q7di14. The park had enough drinking fountains (importance re satisfaction?) (infrastructure) | Pearson Correlation | .135** | .324** | .275** | .303** | .143** | .290** | .262** | .283** | .285** | .248** | .346** | .330** | .270** | .345** | .327** | .268** | .289** | .393** | .361** | .474** | .366** | .414** | .468** | .243** | .288** | .504** | .336** | .377** | .306** | .130** | .348** | .296** | 1 | | |
| | | Sig. (2-tailed) | .002 | .000 | .000 | .000 | .001 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .003 | .000 | .000 | | | |
| 34 | Q7di15. The park had safe multi-use walking and bicycling paths (importance re satisfaction?) (exercise` | Pearson Correlation | .168** | .262** | .308** | .323** | .219** | .207** | .326** | .208** | .291** | .247** | .301** | .203** | .244** | .378** | .322** | .234** | .299** | .351** | .363** | .411** | .360** | .392** | .373** | .360** | .351** | .352** | .234** | .323** | .390** | .232** | .339** | .191** | .437** | 1 | |
| | | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | |
| 35 | Q7di16. The park had separate paths for walking and bicycling (importance re satisfaction?) (exercise` | Pearson Correlation | .115** | .305** | .292** | .292** | .185** | .232** | .289** | .267** | .301** | .200** | .336** | .245** | .245** | .337** | .326** | .254** | .229** | .309** | .323** | .437** | .365** | .349** | .370** | .307** | .297** | .376** | .308** | .318** | .345** | .216** | .337** | .264** | .470** | .512** | 1 |
| | | Sig. (2-tailed) | .009 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=513

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## Photographic Image References

Figure 6: Standard shuttle bus with pedestrian steps not catering to the older adult. [Untitled illustration of a shuttle bus in use]. Retrieved November 26, 2016 from https://hopenetwork.org/services/support-services/transportation/senior-transportation/

Figure 7: Lift gate equipped shuttle bus catering to the older passenger. Zagofsky, A. (2014). *Senior Shuttle in Use* [Online image]. Retrieved November 26, 2016 from http://www.westsac.com/news-ledger/2014/12/16/changes-coming-to-senior-shuttle-in-west-sacramento/

Figure 8: Typical shared-use path for pedestrians and cyclists. *Reid Hwy shared path* [Online Image]. (2013). Retrieved November 26, 2016 from https://commons.wikimedia.org/wiki/File:E37_Reid_Hwy_shared_path.jpg

Figure 9: Typical shared-use path for pedestrians and cyclists. [Untitled illustration of a shared bike path in use in Perth]. Retrieved November 26, 2016 from https://www.bwa.org.au/better-biking/761/

Figure 10: Congestion and conflict - shared-use path. *Cyclists v. Pedestrians* [Online Image]. Retrieved November 26, 2016 from http://velocitywa.com.au/wp-content/uploads/2012/02/cyclists-v-pedestrians-300x168.jpg

Figure 11: Siting of park with mature existing trees providing shade for older adults. [Untitled image of Kings Park and Perth]. Retrieved November 26, 2016 from http://www.experienceperth.com/sfimages/default-source/city-highlights-self-drive/kingspark-city-view.jpg?size=294

Figure 12: Young trees provide no shade for older adults. Mingor.net, (2012). *Alkimos Park* [Online Image]. Retrieved November 26, 2016 from http://www.mingor.net/images-large/alkimos-park-2012.JPG

Figure 13: New Park with no shade for older adults. *Stunning view of the Waterfront Park.* [Online Image]. Retrieved November 26, 2016 from http://www.weekendnotes.com/im/008/01/shorehaven-waterfront-park-beach-ocean-white-sand-1.jpg

Figure 14: Permanent shade structures providing year round shade for older adults. *Shade for Desert Breeze Park.* [Online Image]. Retrieved November 26, 2016 from https://shade-n-net.com/wp-content/uploads/2012/04/COC-Desert-Breeze-Park1-850x422.jpg

Figure 15: 'Off-the-leash' Dog Park – fenced to reduce conflict with older adults. *Very busy dog park* [Online Image]. Retrieved November 26, 2016 from https://4.bp.blogspot.com/--J2bpuGT170/Vxhpqgd5CvI/AAAAAAAAAEVw/8Zg68n3AUTcV0nVBvkEqXfWcwWoJU7uhQCLcB/s1600/Very-Busy-Dog-Park.jpg

Figure 16: Separation of pedestrian and cycle modes using painted lines. *Chilco Street Separated Path* [Online Image]. Retrieved November 26, 2016 from http://sf.streetsblog.org/wp-content/uploads/sites/3/2016/08/Chilco-Street-Separated-Path-580x435.jpg

Figure 17: Physical separation of pedestrian and cycle modes onto independent paths. *The path along the Lac St. Louis Waterfront in Lachine* [Online Image]. Retrieved November 26, 2016 from http://gobiking.ca/quebec-rides/cycling-in-montreal/#

Figure 18: Indicative uses communicated through diverse paving colors and treatments. [Untitled image of separated bike and pedestrian uses]. Retrieved November 26, 2016 from http://www.cambridgema.gov/~/media/Images/CDD/Transportation /Bike/VassaratStata.JPG?la=en

Figure 19: Physical separation of pedestrian and cycle modes via concrete curbing. *Cycle path along the north side of the river into the city* [Online Image]. Retrieved November 26, 2016 from http://www.cycleperth.com.au/wp-content/uploads/2015/05/76-960x300.jpg

Figure 22: Potential trip hazard for older adults - varying materials and textures in paving. *South Perth Foreshore 2005-03-30* [Online Image] (2005). Retrieved November 26, 2016 from https://upload.wikimedia.org/wikipedia/commons/7/7d/South_Perth_Foreshore_2005-03-30.jpg

Figure 23: Potential trip hazard for older adults – change in paving materials. [Untitled image of separated bike and pedestrian path]. Retrieved November 26, 2016 from http://www.accesswa.com.au/FeatureImages/28046.JPG

Figure 24: Hazard-free paving for older adults – single, uniform material. [Untitled image of smooth pedestrian path]. Retrieved November 26, 2016 from http://www.topseal.com.au/gallery/concrete/attachment/img_0056/

Figure 25: Children's playground with no seating amenity for older (or younger) adults. [Untitled illustration of Shaded Children's Play Structure]. Retrieved November 26, 2016 from http://i1111.photobucket.com/albums/h468/buggybuddys/blogs/IMG_4406_zps6f23cddc.jpg