BOTANIC GARDEN USER OUTCOMES: A MEANS-END INVESTIGATION

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ABSTRACT

Botanic Garden User Outcomes: A Means-End Investigation

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This study explored the outcomes that *Leaning Pine* Arboretum users experience from visiting the botanic garden. Understanding visitor motivations and benefits has been a focus in the field of outdoor recreation, and the subject of a number of botanic garden and green space visitor studies. Previous studies have found that visiting a botanic garden can serve as a coping strategy for dealing with and reducing life stress (Holbrook, 2010; Kohlleppel, Bradley, & Jacob, 2002; Maller, Townsend, Pryor, Brown, & St Leger, 2005) and that visiting public outdoor green spaces led visitors to experience greater exposure to natural spaces and to have meaningful experiences with others (Burgess, Harrison, & Limb, 1988).

This study employed means-end theory (Gutman, 1982) to investigate the link between garden attributes and user outcomes. In-person interviews were conducted with 83 garden visitors during the summer of 2011. Researchers coded the interview data to identify participants' reported attributes, consequences, and values. Intercoder reliability was conducted to ensure validity of the results. Coded data were entered into the Laddermap (Gengler & Reynolds, 1995) computer software program to be analyzed. Implication matrixes were created to determine the number of times concepts were linked. From the implication matrixes, hierarchical value maps (HVMs) were developed to display the results graphically. HVMs show the strength of links between attributes, consequences, and values, and were used to compare results from different visitor groups

within the study. These groups included males and females, students and non-students, and first time and return visitors.

The findings revealed that participants felt that the *botanic garden* and *plants* were the most meaningful garden attributes. These garden attributes led participants to experience the consequences *new experiences and learning stress* and *relief and relaxation*. Having experienced these meaningful consequences allowed participants to reach the most frequently mentioned values: *transference* and *improved quality of life*. The study found important links between attributes, consequences, and values, including the consequences *escape* and *stress relief and relaxation*, and the consequence *new experiences and learning,* and the value *transference*. Important differences were also found between the attribute, consequence, and value chains of multiple visitor groups.

Botanical garden and arboretum mangers may use this study to improve visitor experiences and outcomes. A better understanding of visitor benefits and outcomes can help managers understand the needs of current visitors, potential visitors, and potential garden supporters. In turn, garden visitors who have better experiences may be more inclined to provide funding or other support to conserve and preserve their local gardens. Based on the results garden managers should maintain a broad range of healthy, well-displayed plants; exert high-levels of detail to all aspects of garden operations; continue to provide opportunities for full visitor immersion; and offer unified, accessible interpretation of garden spaces and plants. Additionally, these results may be used to validate funding requests and guide allocation of funding.

ACKNOWLEDGEMENTS

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CHAPTER ONE

INTRODUCTION

This study examines the relationship between *Leaning Pine* Arboretum visitor attributes, consequences, and values. This chapter presents general background information on the study, a statement of the problem, professional significance, a purpose statement, research questions, and definitions of terms.

General Background

Botanic gardens have been an integral part of society for hundreds of years and a large number of these gardens' resources are dedicated to educating visitors about issues ranging from gardening techniques and skills to environmental awareness and resource conservation.

Understanding individuals' motivations for visiting botanic gardens and other similar outdoor spaces is important as approximately 200 million people visit botanic gardens each year (Chang, Bisgrove, & Liao, 2008). Botanic garden managers often develop and maintain gardens with the assumption that visitors frequent botanic gardens for educational purposes (Ballantyne, Packer, & Hughes, 2008). Studies on visitor motivations have shown that in reality, botanic garden visitors are often motivated to pursue a wide range of leisure activities outside of horticultural interests, including social time with friends and family, mental relaxation, or other hobbies (Connell, 2004; Nordh, Alalouch, & Hartig, 2011; Ward, Parker, & Shackleton, 2010).

Understanding visitor benefits has been a focus of a number of botanic garden visitor studies which have revealed multiple psychological, social, health, and community

benefits that botanic garden visitors obtain from their experiences (Burgess et al., 1988; Kohlleppel et al., 2002; Maller et al., 2005; Murray, Price, & Crilley, 2007; Ward et al., 2010). These benefits may be cited by garden managers to justify financial support and funding requests, as well as to advocate garden visitation as a healthy, social pastime.

Researchers have sought to find relationships between particular attributes of a botanic garden and visitor outcomes. In undertaking this topic, researchers have applied a variety of methods including surveys (Connell, 2004; Sherburn & Devlin, 2004), psychological stress process models (Kohlleppel et al., 2002), and landscape narrative, which combines landscapes and man-made props to help tell a story (Chang et al., 2008). These methods allowed for identification of specific attributes of a botanic garden that led to desired outcomes. Attributes of a botanic garden visit might include attributes specific to the garden itself, such as the plants or the physical environment. However, they may also include attributes specific to the visit or the visitor, such as spending time with friends and family or participating in a specific activity. Botanic garden managers may use the identified relationships between specific attributes and outcomes to help develop garden characteristics that provide more meaningful experiences.

Statement of Problem

Throughout the field of recreation and leisure "managers…*do* need better information on the benefits of leisure activities. They are facing greater fiscal and personnel constraints each year. They need better information to justify their very existence and to do a better job of managing with limited resources" (Lewis & Kaiser, 1991, p. 24). One way to manage limited resources and justify one's existence is to better

understand users' desired visitation outcomes. Although many botanic gardens, such as the *Leaning Pine* Arboretum, are important educational components on their host university campuses, little is understood about these gardens' visitors, their motivations to visit, and the outcomes/benefits they receive from these visits. Connell (2004) asserts "there has been a consistent neglect of the subject in tourism and recreation management literature" (p. 229). In an attempt to answer such questions, current research focuses on visitor attributes and motivations (Ward et al., 2010). Contrary to popular garden management expectations, such research has shown that visitors may not be interested in education during their garden experience and may visit gardens to pursue other leisure activities (Ballantyne et al., 2008). Research on outcomes of visitor experiences has previously been restricted to studies of community wide benefits, reducing individuals' stress levels, physical health benefits, and visitor satisfaction as a predictor of return visitation and word of mouth recommendation. However, research-to-date lacks analysis of how garden attributes affect personal values. Researchers cite the need for further studies into botanic garden visitor motivations and benefits (Ballantyne et al., 2008; Murray et al., 2007).

<div align="center">Professional Significance</div>

Utilizing means-end theory in botanic garden research provides a number of practical applications for garden managers. Garden management could use this information to design gardens that will help enrich users' experiences and lead them to values that can positively affect their lives. Additionally, managers could use this information to better allocate often scarce resources towards garden attributes that lead to

the desired visitor outcomes. Research results may also assist in the obtainment of

funding by demonstrating the socio-psychological value of botanic garden experiences.

Purpose Statement

The purpose of this study was to understand the outcomes using means-end theory

that individuals experience from visiting the *Leaning Pine* Arboretum.

Research Questions

1. What are the attributes, consequences, and personal values of *Leaning Pine* Arboretum

visitors?

2. What are the differences between student and non-student visitors' attributes,

consequences, and values?

3. What are the differences between male and female visitors' attributes, consequences,

and values?

4. What are the differences between on and off campus visitors' attributes, consequences,

and values?

5. What are the differences between first time and return visitors' attributes,

consequences, and values?

6. What are the differences between visitors of different ages attributes, consequences,

and values?

Definitions

Arboretum. "A place where trees, shrubs, and herbaceous plants are cultivated for scientific and educational purposes" (Abate, 1996, p. 67).

Attribute. A physical characteristic of a product, service, or experience (Reynolds & Gutman, 1988).

Botanic Garden. "An institution holding documented collections of living plants for the purposes of scientific research, conservation, display and education" (Botanic Gardens Conservation International, n.d.a, para. 4).

Consequence. The result a person experiences after partaking in a product, service, or experience that has physical attributes. Consequences can be positive or negative (Gutman, 1982).

Laddering. Interview technique that uses the question "Why is that important to you?" to connect attributes referenced by interviewees to direct consequences and higher level values (Reynolds & Gutman, 1988).

Link. A link between two means-end concepts. Links can connect concepts on the same level or between levels of a means-end chain, i.e. attribute to attribute or attribute to consequence. However, links are unidirectional, they connect concepts moving up the means-end chain from attributes toward values.

Means-end chain. A model that connects together the attributes of the product, service, or experience, the consequences of those attributes, and the values important to the person (Reynolds & Gutman, 1988).

Means-end theory. Means-end theory seeks to understand how products, services, and experiences create meaning for people. The theory focuses on the links between

attributes found in products, services, or experiences (the "means"), consequences that result directly from the attributes, and personal values (the "ends") that consequences potentially lead to (Gutman, 1982; Reynolds & Gutman, 1988).

Values. The desired psychological end state for a person. A value is the highest potential level of abstraction attainable as one moves up the means-end ladder from the more concrete attributes to abstract value-states (Gutman, 1982).

CHAPTER 2

REVIEW OF LITERATURE

This chapter provides a background of studies regarding visitor experiences and outcomes in botanic garden and other similar outdoor spaces, as well as a background on means-end theory. The chapter has been divided into the following sections: Botanic Garden Overview, Empirical Research of Botanic Garden User Experiences, and Means-End Theory. For the purposes of this research, the terms "botanic garden" and "arboretum" are used interchangeably and are both defined as institutions where plants are held for purposes of scientific research and education.

Botanic Garden Overview

This section is intended to provide a brief background on the history of botanic gardens as public spaces and how their usage and place in society has evolved over time.

According to Botanic Gardens Conservation International (BGCI, n.d.a), an internationally recognized society for botanic gardens, "botanic gardens are institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education" (para. 4). These specialized purposes separate botanic gardens from public parks, urban green spaces, and wilderness areas. Botanic gardens have been an integral part of society for hundreds of years. The first true botanic gardens were built in Europe as "physic gardens" (BGCI, n.d.b) as plant species were brought back from newly discovered lands. These botanic gardens served as a repository for the newly discovered botanic wealth, a place to evaluate and research newly found plant species for their economic (Ward et al., 2010) and aesthetic potential, and a place

for community members to interact with these plants. According to Elliott, Watkins, and Daniels (2007), in the late eighteenth and early nineteenth centuries, arboretums were developed "as places for the cultivation and display of a wide variety of both deciduous and coniferous trees" (p. 6) that combined plantations and botanic gardens. Elliot et al. (2007) further stated that during this time period in British culture, trees were held in parallel esteem to works of art or antiquities and were considered "highly desirable for their own beauties as a backdrop for parks" (p. 7).

At the same time that the first European botanic gardens were being developed, private homes and gardens were opened for public visitation. According to Connell (2005), such gardens were not developed for visitors but over time these gardens "adopted and adapted their facilities for this function—the consumption of pleasure by the public" (p. 185). Private garden visitation began as country home owners allowed other elite, upper class people to visit their country homes and gardens (Connell, 2005). Public interest in gardens grew in the 19th century as the growing urban middle class emulated upper class recreation pursuits (Constantine, 1981). According to Connell (2005), major cities established public botanic gardens in the 1800s, which also added to the growing public interest in garden visitation. Later in the century, country home owners regulated garden visitation and began to charge admission fees. As visitation steadily increased, the reasons for visitation evolved from a simple desire to see flowers to a complex blend of social, intellectual, and personal factors. In part gardens create an opportunity to retreat from everyday modern life into a pleasant environment reflecting a simpler past. These ideals are echoed in other research that point to gardens as being spiritually satisfying, and creating a tranquil environment for leisure consumption

(Connell, 2005). These gardens and plants allowed people to learn about and vicariously explore distant lands in a time before mass media and global tourism.

This tradition of building gardens as a way for people to interact with plants has continued to flourish. With 2,500 botanic garden related organizations in modern and developing nations spread throughout the world (Ward et al., 2010), botanic gardens perform a major role as research sites, reservoirs of biodiversity, tourist destinations, education and public outreach centers, as well as by providing exposure to species and ecosystems that visitors may never otherwise experience. Receiving approximately 200 million visitors each year (Chang et al., 2008), a large number of these gardens' resources are dedicated to educating visitors about issues ranging from gardening techniques and skills to environmental awareness and resource conservation. As a public learning institution, botanic gardens have "an increasing important role to play in society, and [this] leisure setting will provide an important medium through which people can acquire information, develop ideas and construct new visions for themselves and their society" (Packer & Ballantyne, 2002, p. 183). Individual botanic gardens vary widely in design, purpose, and features, but most are typically associated with environmental conservation, education, or historical interpretation.

Empirical Research of Botanic Garden Visitor Experiences

This section is intended to provide an examination of the literature on empirical research of botanic garden visitor experiences, including outcomes, motivations, and benefits. In addition to studies on botanic gardens, this literature review includes research conducted in several other similar types of spaces, including urban green spaces (such as

public parks) and greenways. Frauman and Cunningham (2001) defined greenways "as open-space corridors serving recreation and conservation purposes" (p. 94). These research areas were reviewed to understand similarities and differences between greenways, parks, and botanic gardens, and explore types of research and theory being applied to places that are similar in function to botanic gardens.

Botanic garden user research has been conducted for numerous years in an attempt to understand garden users and the benefits of botanic gardens. Many studies utilize simple surveys or questionnaires and focus on visitor attributes and demographics, without a theoretical backdrop, they simply attempt to get a reading on who is visiting and why (Sherburn & Devlin, 2004). This portion of the literature review is divided into the following four thematic sections: Visitor Motivations, Visitor Benefits, Interaction of Garden Attribute and Visitor Outcomes, and Visitor Characteristics. As most of the studies reviewed had elements that fit more than one of the four themes, information relevant to each theme is analyzed in the appropriate section.

Visitor Motivations

The field of outdoor recreation research has studied visitor motivations extensively. This body of research has yielded a standardized list of categories "that can be used to measure motivations" in recreation (Manning, 1999, p. 171). The majority of botanic garden visitor motivations from the literature align with terms and phrases from this list, including family togetherness, similar people, learning, creativity, enjoy nature, escape personal/social pressures, and escape physical pressure (Manning, p. 168-170). Understanding users' motivations for visiting botanic gardens and other similar outdoor

spaces has been an important focus in research studies. This focus is considered important because botanic garden managers often develop and maintain gardens with the assumption that users' visit botanic gardens for educational purposes. Through the following studies, researchers have attempted to test this underlying assumption of botanic garden management.

By exploring the motivations of garden visitors in Great Britain, Connell (2004) laid a foundation for building knowledge and understanding of reasons for visiting botanic gardens. In this study, a large portion of visitor behavior fell into three categories: interpersonal pursuits (such as picnicking), activity based behavior (such as photography), and contemplative activities (such as wildlife observation). From this information, Connell distilled three main dimensions that motivate garden visitors. Social motivations (such as being with friends and family or simply around other people with similar interests), horticultural motivations (such as viewing impressive garden designs and high levels garden maintenance), and setting based motivations (such as a tranquil environment to spend leisure time in). While some visitors reported horticultural based motivations, which included a desire to learn about plants and gardens, many of the reported motivations did not pertain to horticultural education.

Two separate studies (Ballantyne et al., 2008; Ward et al., 2010) found that botanic garden visitors were more motivated by non-horticultural or educational purposes. Ballantyne et al. (2008) studied the environmental awareness, motives, and interests of botanic garden visitors. This survey of garden visitors focused on answering research questions gathered on visitor attributes and motives and did not employ a specific theory. The results revealed that visitors had a relatively low interest and

commitment to conservation issues; instead visitors were motivated by personal enjoyment, scenery, spending time in the outdoors, and time with friends and family. Frequent visitors were more likely to be interested in restorative activities rather than education or conservation. The researchers recommended that botanic garden managers who are interested in creating activities that focus on conservation should give careful consideration as to how to present these activities, and that designing experiences that blend with visitors' desire for relaxation may help botanic gardens be more effective at communicating their educational messages. Similarly, in a study of South African botanic garden visitors, Ward et al. (2010) found that relatively few visitors cited horticultural or educational reasons for visiting. Most participants visited for relaxation, restoration, and to enjoy the outdoors with friends and family. This was especially true of return visitors.

Nordh et al. (2011) studied visitation of small parks and open spaces in Oslo, Norway to determine what attributes affect visitor motivation when seeking psychological restoration. The researchers found that park visitation choices were motivated by preferences to visit parks with water components, with few people (versus no people or many people), and with "many trees, many bushes, all grass cover, a small fountain, and flower beds" (p. 101). This study indicated that users were motivated to visit botanic gardens and similar outdoor spaces for mental relaxation and clarity. Packer and Ballantyne (2002) drew links between botanic gardens as public institutions of learning and results from their study on museum, art gallery, and aquarium. In this study the researchers found five main reasons people visit such public institutions of learning: learning and discovery, passive enjoyment, restoration, social interaction, and self-fulfillment.

Although botanic garden managers have often developed gardens with horticultural education in mind, these studies on visitor motivations have shown that botanic garden visitors are often motivated to visit botanic gardens to pursue a wide range of leisure activities including social time with friends and family, mental relaxation, horticultural interest, or other hobbies. These studies demonstrated the need for understanding garden visitors and their motivations to help guide botanic garden or other outdoor space managers to plan future developments and maintain current operations.

Visitor Benefits

Recreation and leisure researchers have extensively studied the benefits of participation, understanding leisure benefits "must be considered in making adequate resource evaluations and in justifying programs. Simply, leisure benefits are too important to too many people to ignore their magnitude and value when justifying programs and budgets, formulating and analyzing policies, and making investment decisions" (Lewis & Kaiser, 1991, p. 22). Manning (1999) described recreation benefits as "either personal, social, economic, or environmental…these higher order benefits are somewhat abstract and are difficult to measure and associate directly with recreation participation" (p. 159). Understanding benefits has been a large focus of a number of botanic garden visitor studies. Researchers cite the need for justifying government spending, the need to document mental and physical health benefits, and for garden managers to promote garden benefits to potential visitors. Through the following studies researchers have attempted to determine the benefits of botanic garden visitations.

Burgess et al. (1988) studied popular meanings and values associated with open spaces around the city of London, England. The need for their study was rooted in the prevailing idea that parks were a historic legacy to be maintained, as opposed to a dynamic environment that should be managed in response to changing local needs and requirements. Researchers used a group-analysis model which is based on group and individual psychoanalytic processes. Group-analysis consists of the group matrix made up of shared experiences and memories that develop and create emotional bonds between group members, free association which takes place as group members identify their own inner feelings and concerns as they make links to things others are talking about, and manifest and latent meanings that are communicated as group members discuss details of the topic. Facilitators guided group meetings and later transcribed recordings to sift out common themes. After conducting these interviews researchers followed up with surveys of the neighborhoods that group members came from using themes from the in-depth interviews to develop questions for a questionnaire that was aimed at collecting quantitative data. Results of this project showed that open spaces create "gateways: to a high quality sensory and natural world; to a non-commercialized world where children can explore…to a good city in which people can come together and share their experiences" (p. 471).

Kohlleppel et al. (2002) made use of the stress process model to analyze the psychological benefits of visiting botanic gardens. The stress process model contains four main components: individual factors, stressors, mediators (coping strategies), and outcomes. Individual factors are personal attributes such as age and gender. Stressors are circumstances that cause stress, such as significant events like the death of a loved one, or

things that cause lower but more consistent levels of stress, such as work deadlines or physical health. Mediators are things that can mitigate stress, including rest and relaxation. Potential negative results of stress (called outcomes in this model) include depression, substance abuse, and poor health fall into this category. They found that visiting botanic gardens functions as an effective coping strategy that leads to perceived stress reduction. Visitors who received the most benefit had the highest levels of stress. Researchers concluded that botanic gardens offer unique experiences that can positively impact visitors well being and could be used as places to help people cope with stress.

In a recent literature review by Maller et al. (2005), 29 individual studies were compiled from a 30 year period from the 1970s to 2001. The continued relevance of these findings have been corroborated in a current review of literature by Holbrook (2010) that focused on health, quality of life, and social outcomes of green spaces, benefits of home gardens and nearby nature, the intrinsic human need for nature, and potential for future research. Both studies found that people have an innate preference for natural environments, and that natural places rank highly as peoples' favorite places. People who live close to nature have a higher satisfaction with life, but just knowing that natural places exist and are available for use can have positive effects, even if people never actually visit them. Further findings from studies have demonstrated many psychological benefits of exposure to nature via gardens and green spaces, ranging from improved concentration and productivity to mental and physical regeneration and recovery. Green spaces are beneficial in combating mental fatigue, enhancing people's ability to recover from past stress, cope with current stress, and reduce future stress. Mental benefits are also apparent in aiding recovery from medical illness and physical injury. Despite the

many studies that have been completed in the past 30 years, Holbrook (2010) points to the need for additional research addressing the physical and psychological benefits associated with being in and interacting with nature.

Murray et al. (2007) explored the dimensions of visitor service quality and benefit attainment at an Australian botanic garden. Visitor service quality is a model that offers a structure for understanding the features or attributes of a product or service, and how customers or visitors respond to the product or service. After considering the quality of attributes that are relevant to them, visitors judge their overall satisfaction with the product or service. These researchers sought to understand which dimensions of service quality predicted attainment of the benefits visitors wanted from their visit, and to discover the relationship between the visitors' levels of recommendation and re-visitation with benefit attainment or service quality. Results indicated that there is a relationship between benefits attainment and service quality performance, and that these features can help predict visitor advocacy for botanic gardens. Additionally, benefits of improvement in physical and mental health were important to visitors.

In their South African botanic garden study, Ward et al. (2010) found that urban green spaces have important psychological, ecological, aesthetic, and health related benefits and that new approaches to social inclusion and green space planning should be encouraged.

These studies revealed multiple psychological, social, health, and community benefits that botanic garden visitors obtain from their experiences. These benefits may be cited by garden managers to justify financial support and funding requests, as well as to advocate garden visitation as a healthy, social pastime.

Interactions of Garden Attribute and Visitor Outcomes

In researching garden visitation, researchers have sought to find relationships between particular attributes of a botanic garden or similar outdoor spaces and visitor outcomes. Researchers applied a variety of methods to conduct these studies, including means-end theory, survey questionnaires, and landscape narrative.

Frauman and Cunningham (2001) used means-end theory to determine relationships between attributes of greenways in Tennessee, visitors' motivation for using these greenways, and fulfillment of visitors' personal values. They found strong links between the greenways' amenities and "stimulation," "autonomy," and "socpsych escape" that led to "excitement in life," "being well respected," and "warm relationships with others." In other words, researchers found that the presence of basic amenities (such as parking lots or pavement) created situations that allowed constrained users (such as disable persons or people with children) to experience autonomy, which led these users to experience feelings of self-fulfillment and respect.

Sherburn and Devlin (2004) looked into the link between academic major, environmental concern, and the existence of a school arboretum. The researchers contended that environmental views can be shaped by education, the attitudes of parents, time in the outdoors, the loss of a personally valued outdoor place, and involvement with environmental issues or groups. Additionally, they stated that any one of these experiences can lead to a need to protect the environment. This study was aimed at exploring whether or not arboretum use related to concern for the environment, and if academic major was connected to these variables. Results documented that students from environmental studies majors placed more value on the campus arboretum than students

from other majors, such as business. The presence of an arboretum is not enough to create environmental concern, only to reinforce feelings in people who are already sympathetic to environmental causes. Additionally, support for the environment may not materialize into the need to visit an arboretum or other natural area.

Chang et al. (2008) employed landscape narrative in a study to determine if the addition of storytelling features can increase visitor interest and knowledge retention in interpretive displays. For example, a typical botanic garden landscape would feature trees that local indigenous people had used to make canoes; while, a narrative landscape display would feature trees as well as the actual canoes that indigenous people made from the trees. Using cognitive theory and affective responses, researchers created a conceptual model in which landscape and landscape with narrative are combined with oral information to create a perceived landscape that leads to pattern recognition and preference judgment on the part of garden visitors. Finally, visitors' judgments lead to a finding of attractiveness and preference for a landscape, and comprehension and retention of interpretive information. These researchers determined that landscape narrative can be used to help increase the visitor outcomes and benefits that managers seek to impart on botanic garden visitors.

In these studies, researchers used a variety of methods to determine relationships between garden attributes and visitors' personal outcomes. These studies allowed researchers to identify specific attributes of a botanic garden or botanic garden experience that lead to desired outcomes. Additionally, these studies allow for identification of relationships between specific attributes and specific outcomes, which may assist botanic garden managers in developing garden attributes for more effective outcome attainment.

Visitor Characteristics

In addition to their main study focus, the majority of the reviewed studies also researched botanic garden visitor characteristics. Visitor characteristic information is important to botanic garden management because it provides botanic garden managers with a snapshot of their current customer base, as well as revealing potential visitor demographic groups that are not visiting. Previous studies collected a varying degree of demographic information on visitor characteristics. This range went from simply noting participant gender (Nordh et al., 2011) to an in-depth examination of visitor background (Connell, 2004). The following is a summary of the research findings on visitor characteristics.

Ward et al. (2010) studied the demographics of botanic garden users within South Africa, and used this information to gain an understanding of the role that botanic gardens play as public green spaces. Differing from the overall population demographics, the results found that garden visitors tended to be white, middle aged, well educated, and from high income brackets.

By exploring the characteristics of garden visitors in Great Britain, Connell (2003) laid a foundation for building knowledge and understanding of what type of people predominately visit gardens. This study asserted that past research had been focused on individual issues at single locations, and had yet to look at the overall state of garden visitation on a national level and as a large sector of the tourism industry. Connell carried out a landmark study, but was only attempting to survey visitor characteristics and motivations, without attempting to apply theory. Connell (2004) gathered a plethora of information on visitor demographics. This research found that the majority of garden

visitors were over the age of 50, white-collared professionals, garden owners, frequent garden visitors (multiple times a year), and were frequent cultural and natural attraction visitors.

Discussion of Means-End Theory

Means-end theory is a product marketing theory that associates consumer values with the products they choose (Gutman, 1982). Means-end theory accomplishes this by drawing links between attributes, consequences, and values (Reynolds & Gutman, 1988).

Defined as a physical characteristic of a product, service, or experience (Reynolds & Gutman, 1988), an attribute leads to the attainment of consequences, which may be benefits or costs. These consequences may then lead to the realization of desired personal outcomes, values. In means-end theory, the relationship between these three elements is called a means-end chain.

Means-End Chain

Means-end chains describe the relationships between the attributes, consequences, and values by linking consumers' thought processes from attribute to consequence to value (Gutman, 1982). Attributes are a physical object, service, or experience. An example of a botanic garden experience attribute is walking through the garden or taking a tour. Consequences are the direct results of an attribute and can be perceived as either negative or positive. Negative consequences of a botanic garden experience, also called costs or risks, might include feeling bored or getting sunburn. Positive consequences, also called benefits, might include learning about plants or feeling relaxed. Values result

from attributes and their consequences. As values, these desired end-states of mind are always perceived as positive. Examples of values resulting from a botanic garden experience may include fun and enjoyment of life or transference of the benefits of the botanic garden experience to other areas of the users' lives. Following this format, an example of a means-end chain could be the attribute of taking a tour, which leads to the consequence of learning about plants, and allows the user to apply this knowledge while working on a backyard garden (transference).

Values

Value statements come from participants' interviews and are matched with a list of values. In order to assure validity, this list of values should be rooted in the literature. This study uses Rokeach's (1973) definition of a value as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (p. 5). A review of the accepted and previously used lists of values assists in categorizing and validating the value statements given by participants during their interviews into distinct values.

Kahle's (1983) List of Values have been used in marketing and consumer behavior literature (Sudbury & Simcock, 2008), as well as means-end theory (Frauman & Cunningham, 2001; Goldenberg, Klenosky, O'Leary, & Templin, 2000; Klenosky, Gengler, & Mulvey, 1993). The eight values that make up the List of Values include: sense of belonging, warm relationships with others, self-fulfillment, being well respected, fun and enjoyment of life, security, self-respect, and sense of accomplishment (Kahle, 1983).

Empirical Means-End Studies

Originally, the application of means-end theory was aimed at marketing and consumer choice research (Gutman, 1982), specifically looking at advertising strategy development and brand management. In the following decade, means-end theory was applied to a variety of social research studies including recycling habits, healthcare, and outdoor recreation (Cummings, 2009). Although the first application of means-end theory to an outdoor garden-like setting occurred with Frauman and Cunningham (2001) research on greenway visitor benefits and outcomes, the theory has been applied to the outdoor recreation field since 1993. Klenosky et al. (1993) were the first researchers to use means-end theory in the field of outdoor recreation. Their study applied means-end theory to skiers' selection of site destination. Results showed meaningful links between attributes, consequences, and values that are associated with a ski trip, including "concepts that link concern about the hills and trails making up a ski resort to the personal values FUN & EXCITEMENT and ACHIEVEMEMENT" (p. 373), and demonstrated the utility of means-end theory in the field of outdoor recreation.

A number of other studies have employed means-end theory in outdoor recreation. Researchers studied the benefits of participation in rope course experiences and found that program participation promoted working together as a group and led to feelings of self-fulfillment (Goldenberg et al., 2000). McIntosh and Thyne (2005) support means-end theory as a valid research method to help understand tourist behavior and values. This theory was also used to examine the outcomes of participation in an Outward Bound program, which included self-confidence, self-reliance, and relationships with others (Goldenberg, McAvoy, & Klenosky, 2005). McAvoy, Holman, Goldenberg, and

Klenosky (2006) found that disabled participants received numerous, lasting benefits from participation in an integrated wilderness adventure program, such as increased self-confidence and the ability to better handle the challenges of everyday life. More recently, a quantitative study conducted on Appalachian Trail hiker motivations revealed that statistically significant relationships exist between attributes, consequences, and values (Gomez, Freidt, Hill, Goldenberg, & Hill, 2010). Means-end theory continues to be a popular research method in a wide-range of fields for studies seeking to make the complex links between a tangible experience and personal values (Finley & Fountain, 2008). As discussed earlier, Manning (1999) described the challenges of measuring recreation benefits and making direct associations between participation and benefit attainment (p. 159). Means-end theory seems to offer a solution to this research challenge by directly linking experience attributes to participants' perceived outcomes/benefits.

Summary

Examining visitor experiences at botanic gardens, the reviewed studies found significant results including understanding visitor motivations and benefits, as well as specific garden attributes that lead to visitor value attainment. Additionally, these studies provide meaningful management suggestions that promote botanic garden development and maintenance to ensure realization of visitor motivations, benefits, and outcomes. However, the research is clearly limited with many additional opportunities to develop understanding of visitor experiences, benefits, and outcomes.

Means-end theory has proven to be a valid research tool throughout a wide range of topics and disciplines. The theory has been successfully applied to a variety of outdoor

recreation research settings. According to McIntosh and Thyne (2005), "rather than forcing [participants] into predetermined categories," means-end theory "enables them to define personal values and attitudes in *their own* terms and context" (p. 260). Means-end theory provides the ability to let participants verbalize their experiences without set parameters. Researchers are then able to distill individual response into categorized themes, which provides meaningful data for analysis.

For these reasons, means-end theory is the theoretical framework of the current study. Such an approach will allow researchers to better understand the relationships between potential attributes of a *Leaning Pine* Arboretum visit and how they lead visitors to attain personal values. This study will be the first application of means-end theory to study the attributes, consequences, and values of a botanic garden visit.

CHAPTER 3

METHODOLOGY

The purpose of this study was to gain an understanding of the outcomes that *Leaning Pine* Arboretum users experience from visiting the botanic garden. This chapter is intended to present a study site description, description of sample population, instruments used, data collections procedures, data analysis, and study limitations.

Study Site Description

The *Leaning Pine* Arboretum is a five acre botanic garden maintained by the Horticulture and Crop Science Department at California Polytechnic State University. This university is located in San Luis Obispo, on the central coast of California, and is a primarily undergraduate university with a population of approximately 19,300 students. The *Leaning Pine* Arboretum features landscapes from the world's five mediterranean climate regions, as well as a prehistoric garden, palm and aloe collection, and formal garden with clipped boxwood hedges. Rolling lawns and meandering paths connect the individual gardens and provide opportunities for visitors to explore the gardens. Open to university members and the general public, the *Leaning Pine* Arboretum functions as an outdoor educational laboratory. Arboretum visitors can take self-guided, docent-led, or cell phone-based tours and read interpretive signs to learn about individual plant species and ecosystems. Additionally, the garden is a peaceful place for rest, relaxation, and social gatherings, with patios, decks, chairs, and benches positioned at strategic points throughout the gardens.

Description of Sample Population

The sampling frame was limited to visitors of the *Leaning Pine* Arboretum during the spring and summer of 2011. The sample consisted of student and non-student, male and female visitors, aged 18 and over. Semi-structured, convenience interviews were conducted in a relaxing and neutral outdoor setting near the entrance to the botanic garden. Individual researchers approached garden visitors and invited them to take part in a casual one-on-one interview. Once visitors agreed to be part of the study, the interviewer gave them a human subject consent form which notified them that participation in the study was voluntary, no risks were associated with the study, they could discontinue the interview at any time, and that their confidentiality would be protected by conducting the interview anonymously.

Instrument Description

Researchers used a digital voice recorder to tape participant responses. Additionally, researchers hand-recorded participant responses to ten demographic questions on a pre-printed interview script (see Appendix A). The first portion of the interview script identified participant demographic information including: gender, age, student status, school being attended (if a student), occupation, whether or not they were employed at Cal Poly, ethnicity, residency, how often they visited the *Leaning Pine* arboretum, and household income. A survey form was completed gathering the demographic information (see Appendix B). The second portion of the interview focused on collection of means-end data. Participants were asked to identify three things they experienced at the *Leaning Pine* Arboretum. After they provided three answers,

researchers asked participates a series of questions about each answer using the laddering technique. A pilot study was conducted with three participants to test the instrument and interview technique. Minor adjustments were made to phrasing of questions as a result, and the interviews were included in the data.

Laddering Technique

To assist researchers in moving from concrete attributes to the more abstract values, means-end theory utilizes laddering as an interviewing technique (Gutman, 1982). McIntosh and Thyne (2005) note that laddering enables interview participants to define personal values in their own terms, and facilitates analysis that is conducive to understanding values and behavior, rather than applying predetermined categories as used in traditional quantitative methods. The application of means-end theory to botanic garden experience may provide a greater understanding of users' experiences and the personal values that underlie their behavior. Understanding the meanings and motivations that participants associate with botanic garden experiences aids researchers in determining the values that participants receive from visiting a botanic garden. Interviewers were coached prior to the data collection period to insure uniformity of interview techniques. Interviewers were instructed to regard the participant as an expert on their botanic garden experience, showing interest in answers while avoiding comments or body language that may lead the participant, and insuring the participant that there was no right or wrong answer.

Data Analysis

After completion of data collection, three researchers worked together to code interview transcripts in order to identify attributes, consequences, and values. To code consequences and values, prior outcomes research was utilized (Kahle, 1983; Klenosky et al., 1993; Packer & Ballantyne, 2002). Once the researchers had agreed on codes, the data was given to an independent intercoder. The independent intercoder, a person not involved in the research but trained in how the coding works, read through the ladders and assigned the codes that they thought best matched the statements. The first intercoder run yielded a 74% reliability, or match between the researchers coding and the intercoder coding. A minimum 80% agreement was required, so the researchers reviewed the data for a second time, adjusted categories, and had the intercoder review the data again and a 82% reliability was reached. Researchers then reviewed the remaining discrepancies in coding and made final decisions on categorization.

Once the final categories had been determined, the coded data was entered into LadderMap, a software program that analyzes means-end theory research (Gengler & Reynolds, 1995). LadderMap was utilized to create an implication matrix, a table that displays the number of times each content code (or attributes, consequences, and values) was related to another content code in all of the participants' ladders. From these implication matrixes, hierarchical value maps (HVMs) were then generated to provide a visual representation of the main links between attributes, consequences, and values. HVMs provided a summary of participant responses rather than a complete data set. The cutoff value associated with each HVM indicates the percentage of data that is included in the corresponding HVM. Attributes, consequences, and values, referred to as concepts,

were connected by lines called links. These links increased in thickness relative to the number of times participants connected concepts. HVMs were created to compare data between all visitors, male and female visitors, student and non-student visitors, on and off campus visitors, first time and return visitors, and visitors grouped into three different age categories, 18-30, 31-49, and 49 and above.

CHAPTER 4

RESULTS

This chapter provides the results of the study. The chapter has been divided into

three sections. The first part, Participant Demographics, reports background information

provided by the study participants. The second section, Means-End Findings, presents

the means-end content codes, frequency of content codes, and number of ladders

completed by participant. The third section, Means-End Associations, describes the

HVM's and reports the strength of associations between attributes, consequences, and

values.

Participant Demographics

Data were collected from 83 *Leaning Pine* Arboretum visitors who participated in

the study during Spring and Summer 2011. Five participants declined to be interviewed

after completing the demographic questionnaire and were not included in the study. The

five participants that did not complete the interview all cited lack of time. Of the

participants that were interviewed, 42 participants were female (50.6%) and 41 were male

(49.4%). In terms of residency, 60 lived in San Luis Obispo County and Santa Maria

(72.3%), 21 lived in other areas of California (25.3%), and two live out of state (2.4%).

The majority, (n =71), of these participants self-reported White/Caucasian ethnicity

(85.5%), with four reporting Hispanic/Latino (4.8%), two reporting Persian (2.4%), four

reporting bi-racial ethnicity (4.8%), and two refusing to answer (2.4%). Participants

ranged in age from 18-78, with a mode of 22-years old and a mean of 40-years old. The

majority, (67 participants), had visited the arboretum previously (80.7%), while the remaining 16 participants were first-time visitors (19.3%). A considerable number, (n =37), of the participants either went to school and/or worked at Cal Poly (44.6%).

Means-End Findings

Content codes and accompanying descriptions were created after consulting relevant literature from previous studies (Frauman & Cunningham, 2001; Packer & Ballantyne, 2002). Consequences and values selected from previous studies from the field of outdoor recreation and visitor motivations were adapted to reflect relevant themes in this specific study (Cummings, 2009; Frauman & Cunningham, 2001; Goldenberg et al., 2000; Packer & Ballantyne, 2002). During the data collection and analysis processes, the researchers identified the attributes, consequences, and values that emerged from the interview data. While reviewing interview recordings and field notes, all content codes were reviewed and modified to better categorize and reflect the core attributes that were experienced, consequences that resulted, and values that were obtained by study participants as a result of their visit.

Means-End Content Codes: Attributes, Consequences, and Values

Content codes were entered into LadderMap computer software and tested for intercoder reliability and 82% reliability was achieved. The final means-end content code list contained 24 codes with accompanying descriptions: 9 attributes, 8 consequences, and 7 values (see Table 4.1).

Table 4.1

Attributes, Consequences, and Values

Attributes	Consequences	Values
Activities	Escape	Fun and Enjoyment of Life
Botanic Garden	Fun	Improved Quality of Life
Friends and Family	New Experiences and Learning	Self-Awareness
Garden Management	New Perspective	Sense of Belonging
Garden Spaces	Personal Improvement	Sense of Place
Location	Shared Experience	Transference
Physical Environment	Spend Time Outdoors	Warm Relationships with Others
Plants	Stress Relief and Relaxation	
Wildlife		

The following descriptions provide some clarification for each content code; some codes were self-explanatory, while others needed to be defined in the context of the study.   The following paragraph describes attributes used in the study. *Activities* refers to things that people came to do at the arboretum such as exercise, attending an event, or visiting as part of a class assignment. *Botanic Garden* is used when a participant responded similarly to "the arboretum itself." *Friends and Family* refers to visiting with others as a group. *Garden Management* includes references to garden manager and staff, overall level of maintenance, and presentation of educational materials. *Garden Spaces* refers to specific gardens and areas such as "Australian Garden" or "deck under the pine trees," as well as paths, benches, and lawn areas. *Location* means references to the arboretum being on campus, close by, or more convenient than other botanic gardens or the natural environments represented within the individual garden spaces. *Physical Environment* includes sensory experiences such as smells or sounds, and weather conditions like sunny skies or pleasant temperatures. *Plants* refers to specific plants within the collections, the variety and type of plant material on display, and visiting

specifically to see plants. *Wildlife* refers to visiting with the intention of observing

wildlife, the presence of wildlife adding to the outdoor atmosphere, and the garden as

habitat for wildlife.

The following paragraph describes consequences used in the study. *Escape* refers

to getting away from society, life obligations, and modern technology. *Fun* refers to

having a good time, being excited, or enjoying oneself. *New Experiences and Learning*

encompasses seeing unique or unusual things, experiencing something for the first time,

and having opportunities for education and learning. *New Perspective* refers to

experiencing a new way of thinking or seeing things from a different point of view.

Personal Improvement includes experiencing personal growth, getting exercise and

improving physical and mental health. *Shared Experience* refers to spending time and

interacting with others during a visit. *Spend Time Outdoors* references being outside in

nature, or having an experience similar to a wilderness area. *Stress Relief and Relaxation*

refers to experiencing relief from the stresses of life or being able to slow down and relax

for a while.

The following paragraph describes values used in the study. *Fun and Enjoyment

of Life* refers to benefits including increased happiness and enjoyment of life. *Improved

Quality of Life* refers to experiencing self-fulfillment or a higher quality of life due to

increased mental or physical health. *Self-Awareness* refers to gaining a deeper

understanding of one's self or what is truly important in life. *Sense of Belonging* refers

gaining an awareness of being part of something larger, such as identifying with a group

of people, an organization, society at large, or finding ones place in the natural order of

things. *Sense of Place* includes reflections on feelings of home or sanctuary in the

arboretum, or a sense of having ownership of a garden space. *Transference* refers to the

experience of transferring knowledge gained during a visit and applying it to another area

of life. *Warm Relationships with Others* refers to developing deeper relationships and

bonding with others during or as a result of a visit.

Ladders Completed by Participants

Attributes, consequences, and values are linked together to form means-end

ladders. Ladders completed by participants ranged from one to six (see Table 4.2). The

mean number of ladders completed by each participant was 2.7 with a mode of 3. The 83

participants completed 238 ladders, which linked 636 concepts. The mean number of

concepts per ladder was 2.87.

Table 4.2

Number of Ladders Completed by Participants

Number of ladders completed	Frequency	Percentage
	(n=83)	100.00%
1	2	2.41%
2	30	36.14%
3	32	38.55%
4	17	20.48%
5	0	0.00%
6	2	2.41%

An example of a complete ladder and concept codes comes from participant #36,

who is a white, 60-year old female who works on the Cal Poly campus and visits the

arboretum multiple times a month.

"The plant life"

- – Attribute: Plants

"It's amazing to discover new plants that were unseen the last time…"

- – Consequence: New Experiences and Learning

"I can use them in gardening in my own yard"

- – Value: Transference

Means-End Associations

The LadderMap software was used to create an implication matrix once all of the participant ladders were completed. The implication matrix presents the number of times each concept was related to another concept (see Table 4.3).

Table 4.3

Implication Matrix of HVM for All Participants

TO:		FROM: 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	plants		2	2	1	2	3			1	44		8	10	5	3	8	1		37	11	6	2	4	3	2
2	botanic garden	2		6	1	1	1	2	1	3	16	35	8	11	17	6	3	4	22	22	8	3	3	3	4
3	activities				2	2	3	1	1		10	7	5	5	2	3	5	3	11	5	3	4	2	2	1
4	garden spaces	2	3		1	2	2	1			16	7	5	3	2	2	1	1	13	7	1	2	4	2	2
5	garden management				1						14	2	5		1	1	2	2	13	4	2	2			2
6	physical environment						2	1			4	11	1	7	3	2		1	4	5	3	1	3	3	
7	location							1	1		5	5	3	4	1		2	1	7	6			3	1	
8	friends and family		1										1	1	1		6	2	3	3		6			
9	wildlife								1		4	4	2	2					3	2			1	2	1
10	New Experiences and Learning												1	7	2	12	1	1	49	15	5	3	6	4	2
11	Stress Relief and Relaxation										2			2	2	1	3	1	12	25	6	2	6	5	4
12	Fun										3	3		1					10	7	6	1	1		2
13	Spend Time Outdoors										3	6	1		2	1		1	7	12	2	1	2	2	2
14	Escape										1	14	1	2		1	2	2	5	8	2		1	2	4
15	New Perspective											2							5	8		1		2	
16	Shared Experience										1				1			2	3	3		9	1		
17	Personal Improvement													1					4	4	1	1			1
18	TRANSFERENCE																			2		1	3		
19	IMPROVED QUALITY OF LIFE																		1		1	1			
20	FUN AND ENJOYMENT OF LIFE																							1	
21	WARM RELATIONSHIPS WITH OTHERS																		1						
22	SENSE OF PLACE																		2					1	
23	SELF-AWARENESS																								
24	SENSE OF BELONGING																								

Hierarchical Value Maps (HVM'S) are graphical representations of the links created by means-end ladders. Content codes or concepts are represented by circles containing the name of the code and the number of participants that mentioned that concept. The size of the circle provides further graphical representation, with the circle increasing in diameter as the value of "n" increases. Circles also appear in one of three different colors: white for attributes, gray for consequences, and black for values. Lines represent links between content codes, with line thickness increasing relative to the number of times participants made associations between concepts. In total 12 HVMs were created from this data (see Table 4.4).

Table 4.4

Table of Hierarchical Value Maps (HVMs)

Figure Number	HVM Title	Number of Participants
4.1	HVM for All Participants	83
4.2	HVM for Male Participants	41
4.3	HVM for Female Participants	42
4.4	HVM for Student Participants	29
4.5	HVM for Non-Student Participants	54
4.6	HVM for On-Campus Participants	37
4.7	HVM for Off Campus Participants	46
4.8	HVM for Return Visitor Participants	67
4.9	HVM for First Time Visitor Participants	16
4.1	HVM for Participants Between Ages 18 and 30	34
4.11	HVM for Participants Between Ages 31 and 49	18
4.12	HVM for Participants Over Age 50	31

Figure 4.1 is the HVM for ladders of all the visitors participating in interviews (*n=83*). This HVM used a cutoff of 2, representing 85% of the data. The most frequently mentioned attributes were *botanic garden* (*n=56*), *plants* (*n=54*), and *activities* (*n=28*). The most frequently mentioned consequences were *new experiences*

and learning (*n=71*), *stress relief and relaxation* (*n=51*), *fun* (*n=27*), and *spend time outdoors* (*n=27*). The most frequently mentioned values were *transference* (*n=61*), *improved quality of life* (*n=42*), and *fun and enjoyment of life* (*n=15*). Meaningful links were present between the consequences *escape* and *stress relief and relaxation*, *new experiences and learning* and *new perspective*, as well as *new experiences and learning* and *fun*. There were also meaningful links between the consequence *shared experience* and the value *warm relationships with others*, as well as the consequence *fun* and the value *transference*.
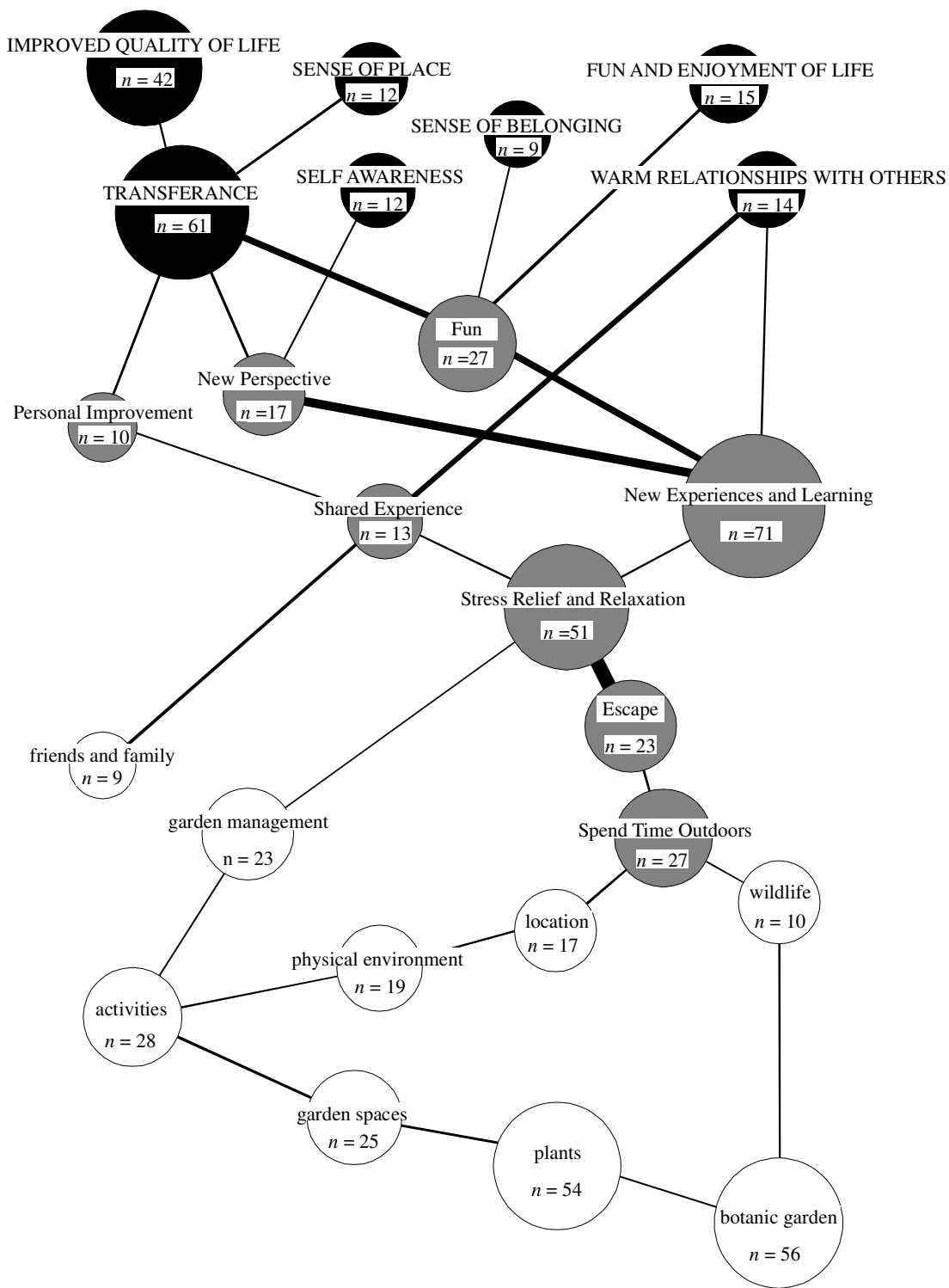
Figure 4.1. Hierarchical Value Map for All Participants (*N* = 83)

Figure 4.2 is the HVM for ladders of male study participants (*n=41*). This HVM used a cutoff of 2, representing 84% of the data. The most frequently mentioned attributes include *plants* (*n=29*), *botanic garden* (*n=22*), and *garden spaces* (*n=14*). The most frequently mentioned consequences were *new experiences and learning* (*n=34*), *stress relief and relaxation* (*n=25*), *escape* (*n=12*), and *fun* (*n=12*). The most frequently mentioned values were *transference* (*n=28*), *improved quality of life* (*n=21*), and *warm relationships with others* (*n=7*). There were meaningful links between the attribute *friends and family* and the consequence *shared experience*. Meaningful links were present between the consequences *escape* and *stress relief and relaxation* as well as *new experiences and learning* and *new perspective*. There were also meaningful links between the following consequences and values: *shared experience* and *warm relationships with others*, *new experiences and learning* and *sense of place*, as well as *fun* and *fun and enjoyment of life*.
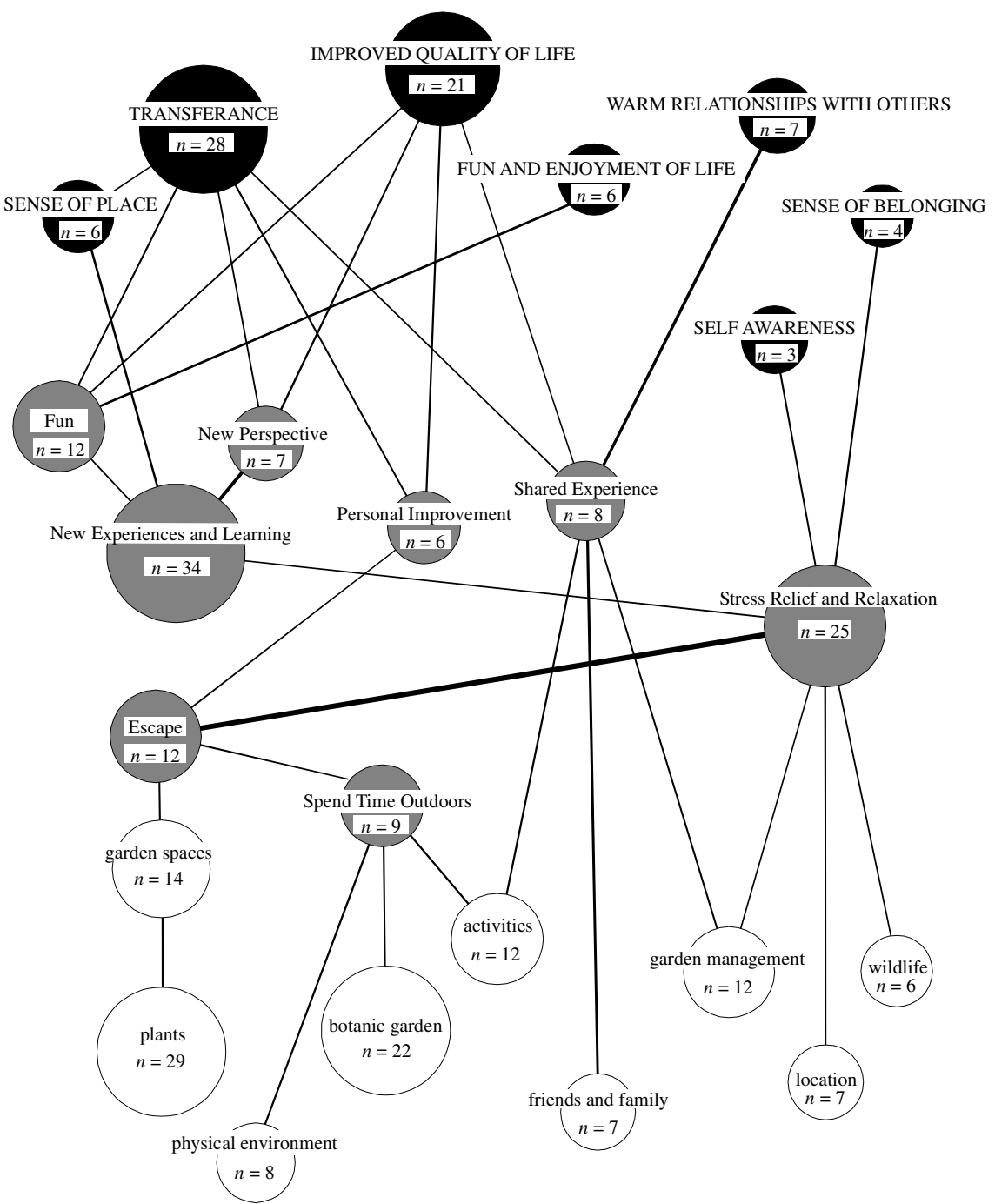
Figure 4.2. Hierarchical Value Map for Male Participants (*N* = 41)

The HVM for ladder of female study participants (*n=42*) (see Figure 4.3) used a cutoff of 2, representing 86% of the data. The most frequently mentioned attributes were *botanic garden* (*n=34*), *plants* (*n=25*), and *activities* (*n=16*). The most frequently mentioned consequences were *new experiences and learning* (*n=37*), *stress relief and relaxation* (*n=26*), and *spend time outdoors* (*n=18*). The most frequently mentioned values were *transference* (*n=33*), *improved quality of life* (*n=21*), *self-awareness* (*n=9*), and *fun and enjoyment of life* (*n=9*). There were meaningful links between the attributes *botanic garden* and *activities*, as well as the attribute *garden management* and the consequence *new experiences and learning*. There were meaningful links between the following consequences: *new experiences and learning* and *fun*, as well as *spend time outdoors* and *stress relief and relaxation*. Meaningful links existed between the consequence *stress relief and relaxation* and the values *transference* and *fun and enjoyment of life*.
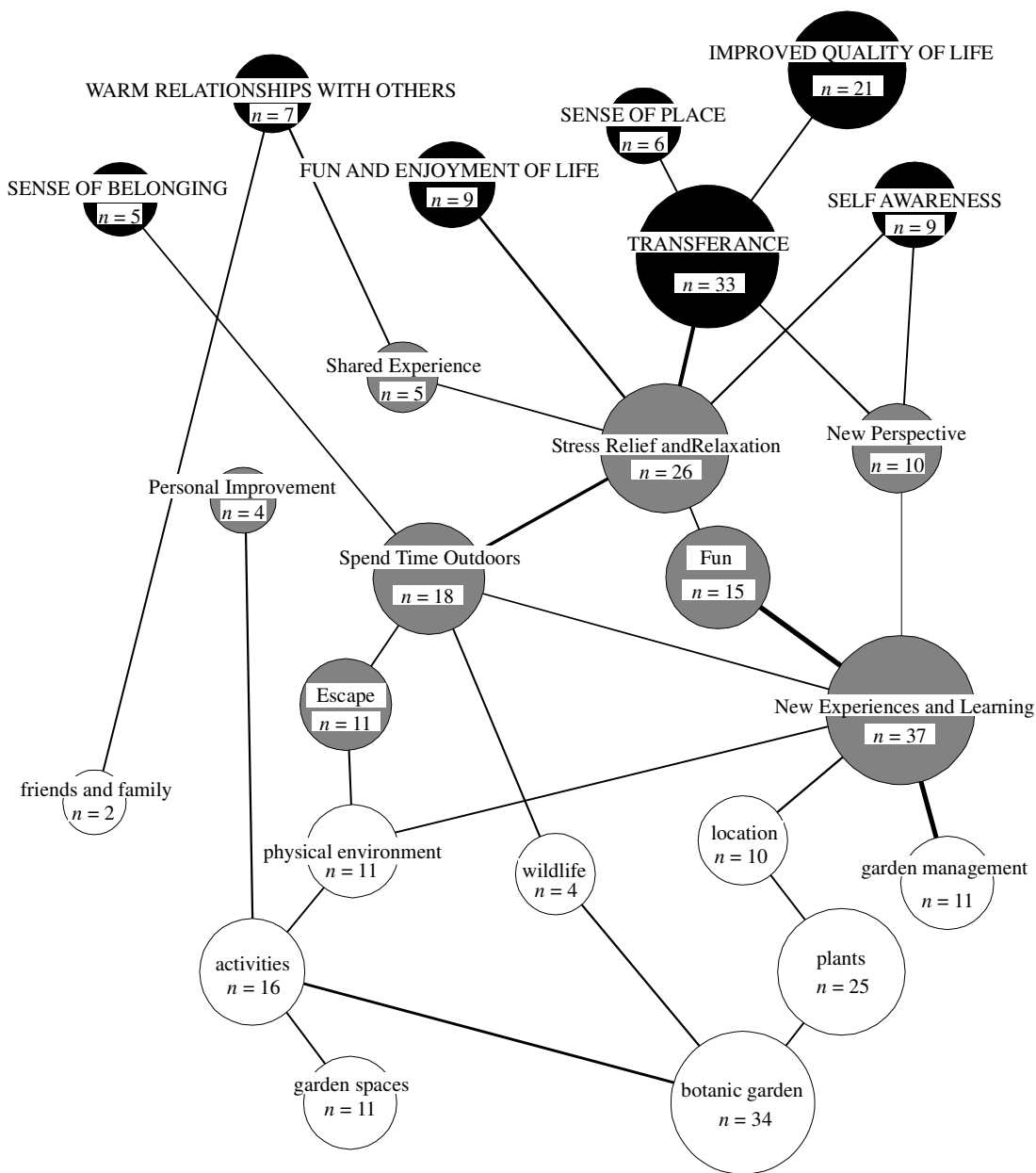
Figure 4.3. Hierarchical Value Map for Female Participants (*N* = 42)

Figure 4.4 is the HVM for ladders of students (*n=29*). The average age of students was 23.78. This HVM used a cutoff of 2, representing 79% of the data.   The most frequently mentioned attributes were *plants* (*n=29*), *botanic garden* (*n=21*), *activities* (*n=13*), and *garden spaces* (*n=13*). The most frequently mentioned consequences were *new experiences and learning* (*n=23*), *stress relief and relaxation* (*n=20*), and *spend time outdoors* (*n=12*). The most frequently mentioned values were *transference* (*n=25*), *improved quality of life* (*n=14*), and *warm relationships with others* (*n=7*). The value *fun and enjoyment of life* was not present in this HVM. There were meaningful links between attributes *botanic garden* and *activities*, as well as the attribute *garden management* and the consequence *new experiences and learning*. There were also meaningful links between the consequences *escape* and *stress relief and relaxation*. Meaningful links existed between the following consequences and values: *stress relief and relaxation* and *self-awareness* and *fun* and *transference*. Finally, there was a meaningful link between the consequence *stress relief and relaxation* and the value *improved quality of life*.
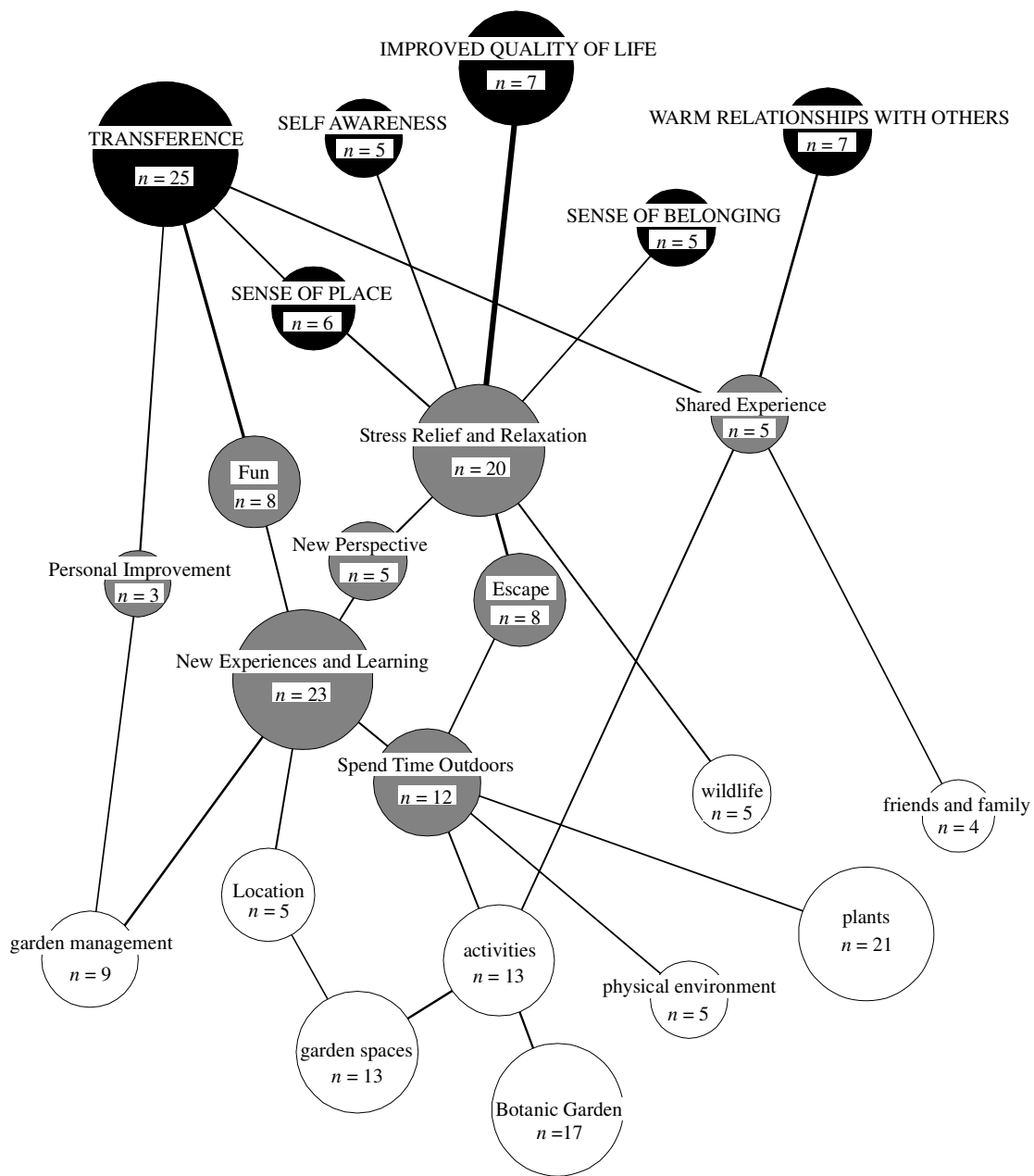
Figure 4.4. Hierarchical Value Map for Student Participants (*N* = 29)

The HVM for ladders of non-students (*n=54*, average age=48.86) (see figure 4.5) used a cutoff of 2, representing 88% of the data. The most frequently mentioned attributes were *botanic garden* (*n=39*), *plants* (*n=33*), and *activities* (*n=15*). The most frequently mentioned consequences were *new experiences and learning* (*n=48*), *stress relief and relaxation* (*n=31*), and *fun* (*n=19*). The most frequently mentioned values were *transference* (*n=36*), *improved quality of life* (*n=28*), and *fun and enjoyment of life* (*n=14*). There were meaningful links between the following attributes and consequences: *physical environment* and *spend time outdoors*, *garden spaces* and *new experiences and learning*, as well as *garden management* and *new experiences and learning*. There were also meaningful links between the following consequences: *new experiences* and *learning and new perspective*, and *escape* and *stress relief and relaxation*. There was a meaningful link between the consequences *new experiences and learning* and *fun*. Finally, there were meaningful links between the following consequences and values: *stress relief and relaxation* and *fun and enjoyment of life*, *shared experience* and *warm relationships with others*, and *new perspective* and *improved quality of life*.
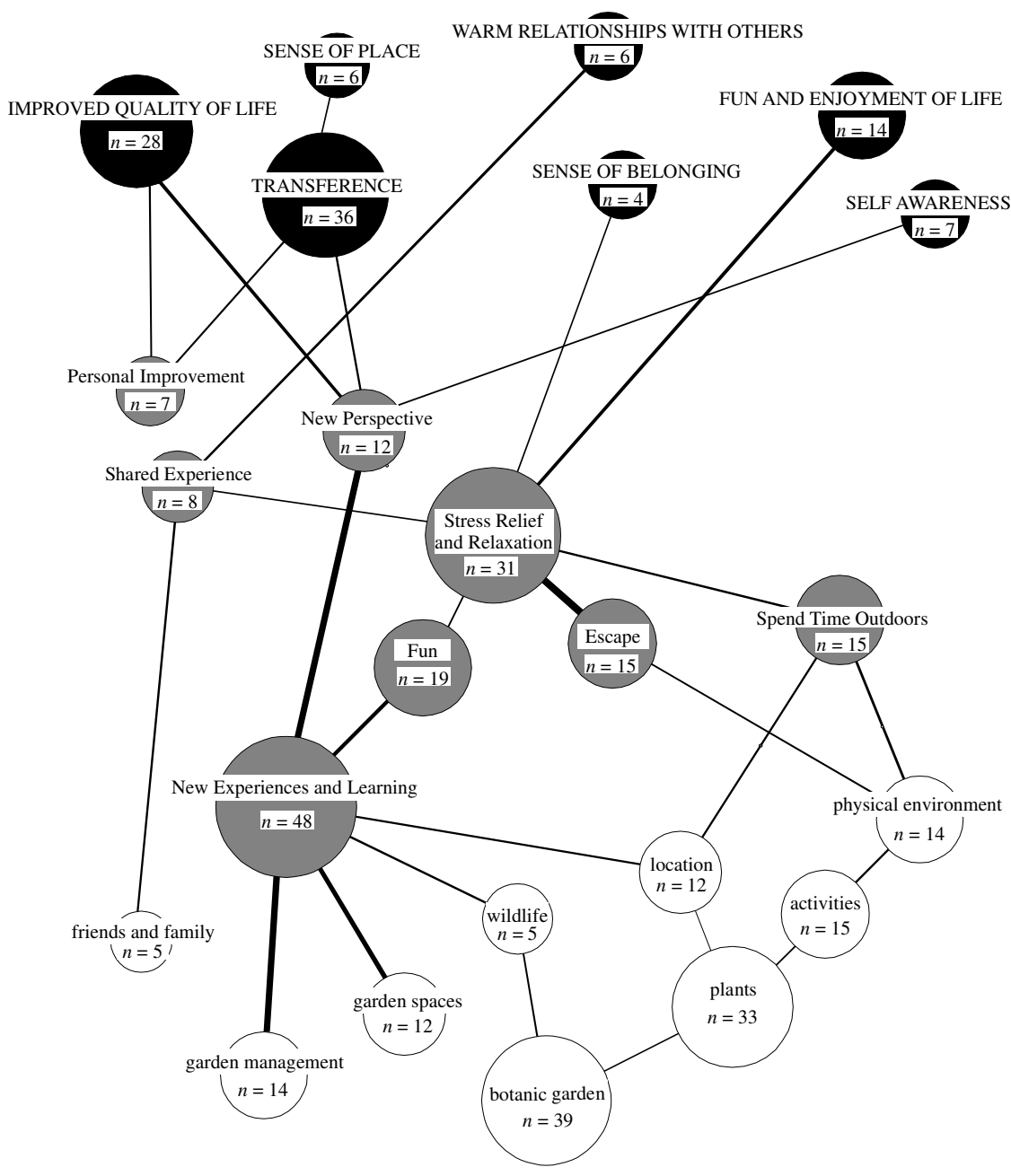
Figure 4.5. Hierarchical Value Map for Non-Student Participants (*N* = 54)

Figure 4.6 is the HVM for ladders of on-campus visitors (*n=37*). This HVM used a cutoff of 2, representing 83% of the data. The most frequently mentioned attributes were *plants* (*n=27*), *botanic garden* (*n=22*), and *activities* (*n=16*). The most frequently mentioned consequences were *new experiences and learning* (*n=30*), *stress relief and relaxation* (*n=25*), and *spend time outdoors* (*n=12*). The most frequently mentioned values were *transference* (*n=32*), *improved quality of life* (*n=21*), and *warm relationships with others* (*n=9*). There was a meaningful link between the attribute *garden management* and the consequence *new experiences and learning*. A meaningful link was present between the consequences *escape* and *stress relief and relaxation*. A meaningful link was present between the consequence *stress relief and relaxation* and the value *improved quality of life*. Finally, a meaningful link was present between the consequence *shared experience* and the value *warm relationships with others*.
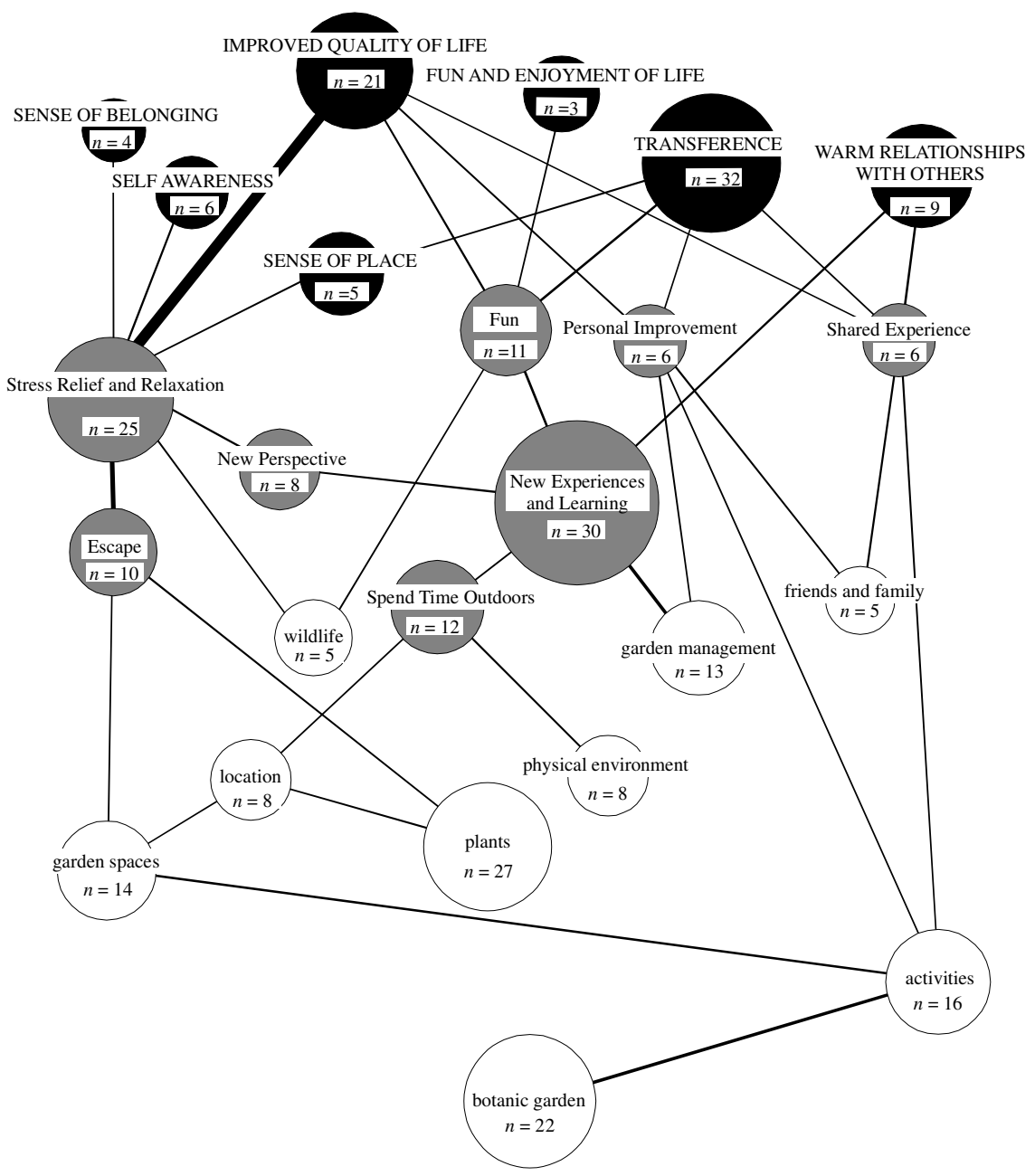
Figure 4.6. Hierarchical Value Map for On-Campus Participants (*N* = 37)

Figure 4.7 is the HVM for ladders of off-campus visitors (*n=46*). This HVM used a cutoff of 2, representing 86% of the data. The most frequently mentioned attributes were *botanic garden* (*n=34*), *plants* (*n=27*), and *activities* (*n=12*). The most frequently mentioned consequences were *new experiences and learning* (*n=41*), *stress relief and relaxation* (*n=26*), *fun* (*n=16*), and *spend time outdoors* (*n=15*). The most frequently mentioned values were *transference* (*n=29*), *improved quality of life* (*n=21*), and *fun and enjoyment of life* (*n=12*). There was a meaningful link between the attribute *botanic garden* and the consequence *escape*. A meaningful link was present between the consequences *new experiences and learning* and *new perspective*. There were also meaningful links between the consequence *stress relief and relaxation* and the value *improved quality of life*, and a moderate link between the consequence *stress relief and relaxation* and *transference*.
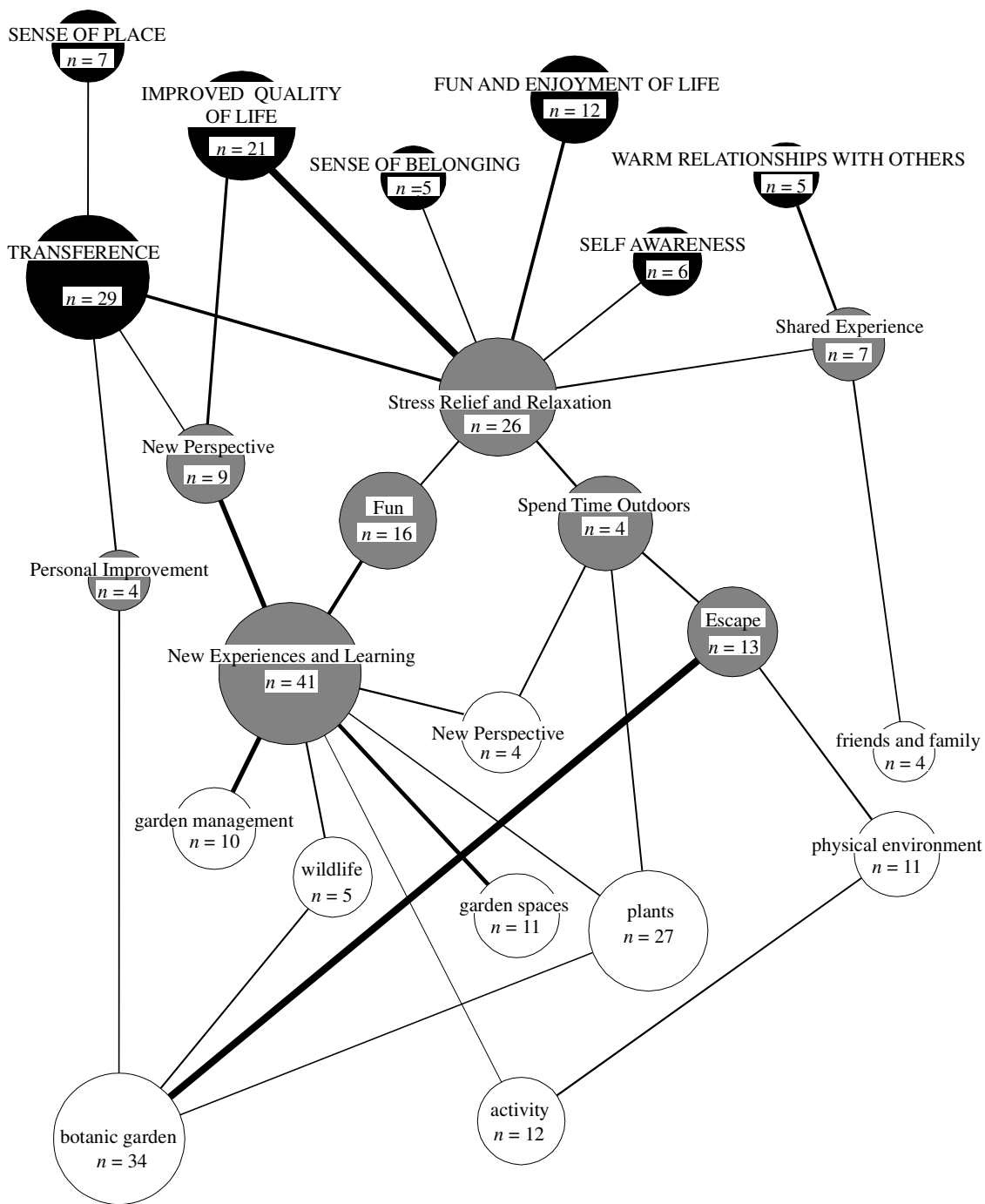
Figure 4.7. Hierarchical Value Map for Off Campus Participants (*N* = 46)

Figure 4.8 is the HVM for ladders of return visitors (*n=67*). This HVM used a cutoff of 2, representing 82% of the data. The most frequently mentioned attributes were *plants* (*n=45*), *botanic garden* (*n=44*), and *activities* (*n=25*). The most frequently mentioned consequences were *new experiences and learning* (*n=58*), *stress relief and relaxation* (*n=44*), and *spend time outdoors* (*n=24*). The most frequently mentioned values were *transference* (*n=48*), *improved quality of life* (*n=33*), and *fun and enjoyment of life* (*n=13*). Meaningful links were present between the following consequences: *escape* and *stress relief and relaxation, new experiences and learning* and *new perspective*, as well as *new experiences and learning* and *fun*. A meaningful link was present between the consequence *fun* and the value *fun and enjoyment of life*. Finally, meaningful links existed between the following consequences and values: *shared experience* and *warm relationships with others*, *new perspective* and *transference*, and *fun* and *transference*.
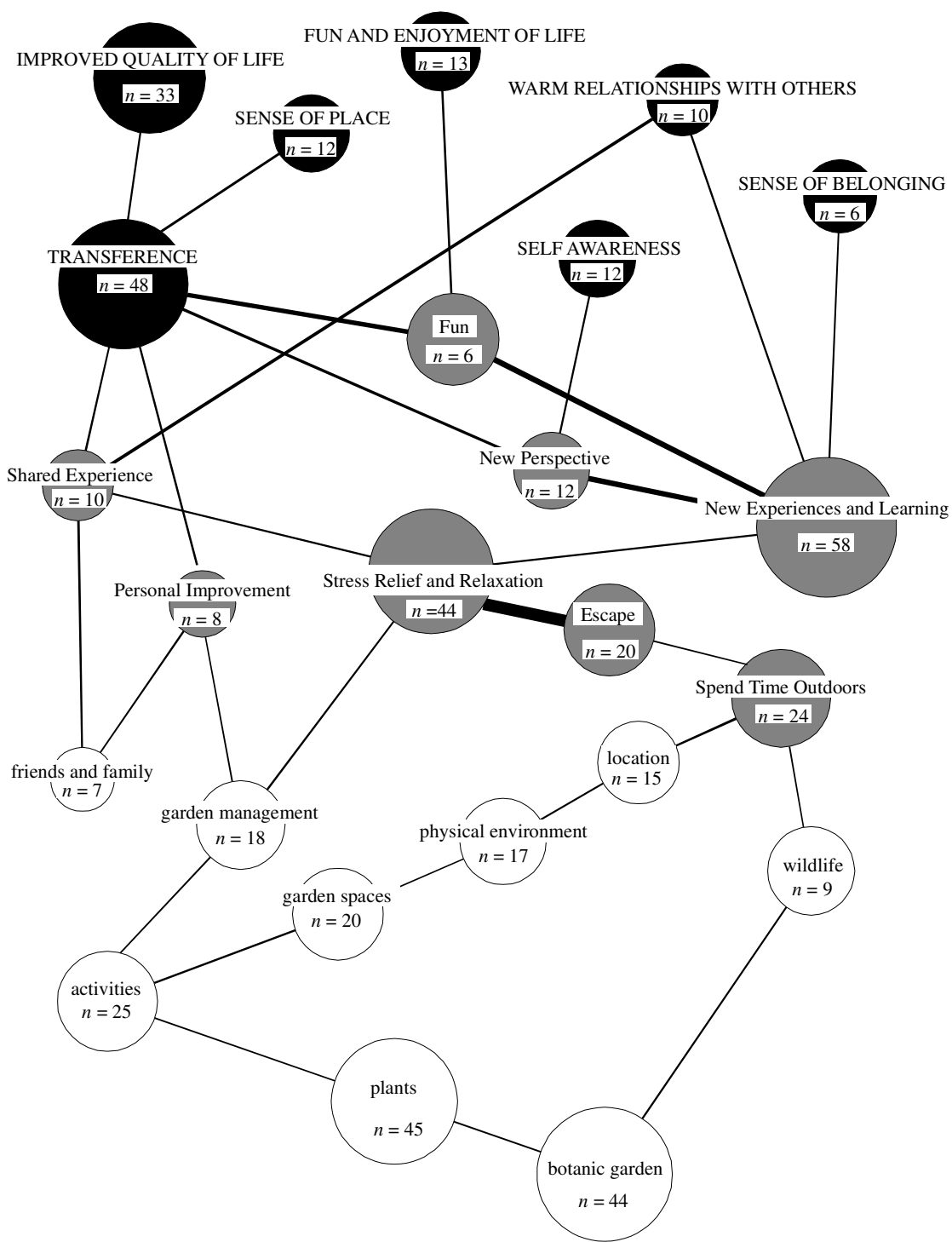
Figure 4.8. Hierarchical Value Map for Return Visitor Participants (*N* = 67)

Figure 4.9 is the HVM for ladders of first time visitors (*n=16*). This HVM used a cutoff of 2, representing 66% of the data. The most frequently mentioned attributes were *botanic garden* (*n=12*), *plants* (*n=9*), *garden management* (*n=5*), and *garden spaces* (*n=5*). The attributes *wildlife* and *physical environment* were not present in this HVM. The most frequently mentioned consequences were *new experiences and learning* (*n=13*), *fun* (*n=7*), *stress relief and relaxation* (*n=7*), and *new perspective* (*n=5*). The consequence *personal improvement* was not present in this HVM. The most frequently mentioned values were *transference* (*n=13*), *improved quality of life* (*n=9*), and *warm relationships with others* (*n=4*). The values *self-awareness* and *sense of place* were not present in this HVM. There were meaningful attribute to consequence links between *plants* and *new experiences and learning* as well as *botanic garden* and *new experiences and learning*. There were also meaningful consequence to value links between *new experiences and learning* and *transference*, and *stress relief and relaxation* and *improved quality of life*.
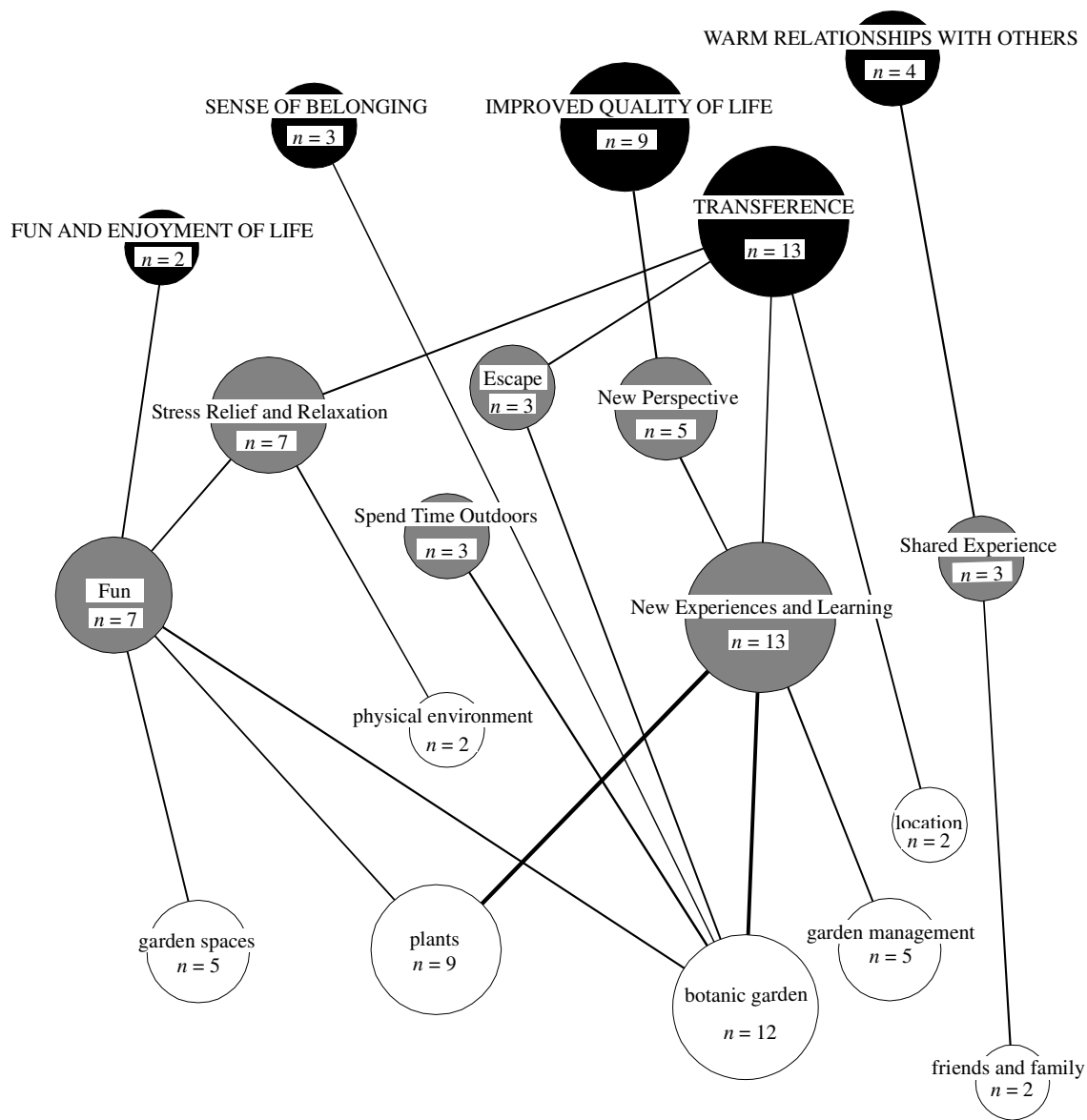
Figure 4.9. Hierarchical Value Map for First Time Visitor Participants (*N* = 16)

Figure 4.10 is the HVM for ladders of visitors under age 30 (*n=34*). This HVM used a cutoff of 2, representing 85% of the data. The most frequently mentioned attributes were *plants* (*n=23*), *botanic garden* (*n=20*), and *activities* (*n=12*). The most frequently mentioned consequences were *new experiences and learning* (*n=27*), *stress relief and relaxation* (*n=23*), and *spend time outdoors* (*n=13*). The most frequently mentioned values were *transference* (*n=26*), *improved quality of life* (*n=15*), and *sense of place* (*n=8*). There were two meaningful attributes to consequence links between *physical environment* and *spend time outdoors*, and *garden management* and *new experiences and learning*. There were meaningful links between consequences *escape* and *stress relief and relaxation*, as well as *new experiences and learning* and *new perspective*. There were also meaningful consequence to value links between *shared experience* and *warm relationships with others*, *fun* and *fun and enjoyment of life*, as well as *fun* and *transference*.
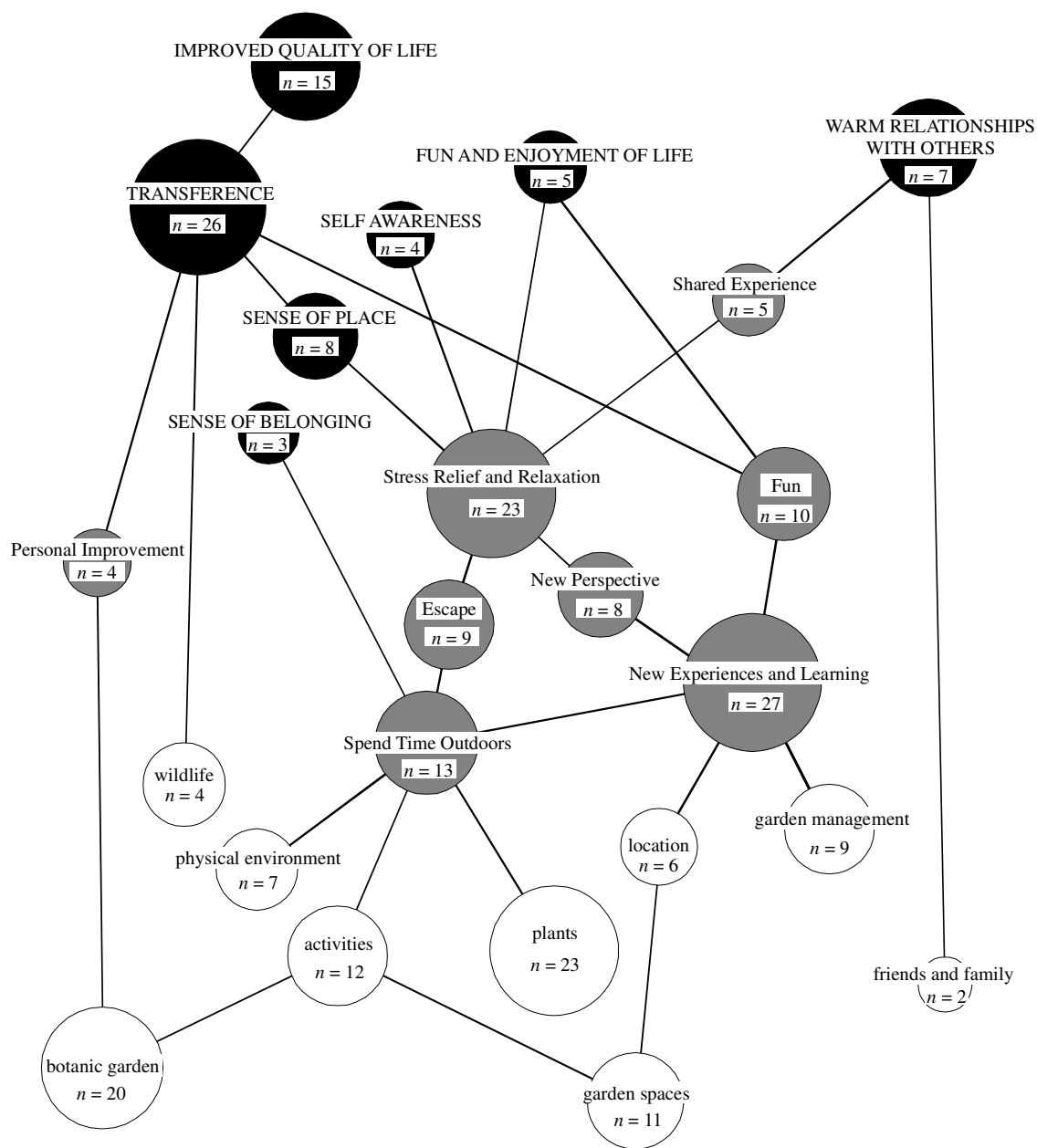
Figure 4.10. Hierarchical Value Map for Participants Between Ages 18 and 30 (*N* = 34)

Figure 4.11 is the HVM for ladders of visitors between the ages of 31 and 49 (*n=18*). This HVM used a cutoff of 2, representing 66% of the data. The most frequently mentioned attributes were *botanic garden* (*n=14*), *plants* (*n=13*), and *activities* (*n=6*), and *friends and family* (*n=6*). The most frequently mentioned consequences were *new experiences and learning* (*n=18*), *stress relief and relaxation* (*n=9*), and *spend time outdoors* (*n=7*). The most frequently mentioned values were *transference* (*n=14*), *improved quality of life* (*n=11*), and *warm relationships with others* (*n=3*). The following values were not present in this HVM: *sense of place*, *sense of belonging*, *self-awareness*, and *fun and enjoyment of life*. There was a meaningful link between the attribute *plants* and the consequence *new experiences and learning*. The attribute *botanic garden* had meaningful links with the consequences *spend time outdoors* and *new experiences and learning*. There was a meaningful link between the consequence *new experiences and learning* and the value *transference*. The consequences *stress relief and relaxation* and *spend time outdoors* linked with the value *improved quality of life*.
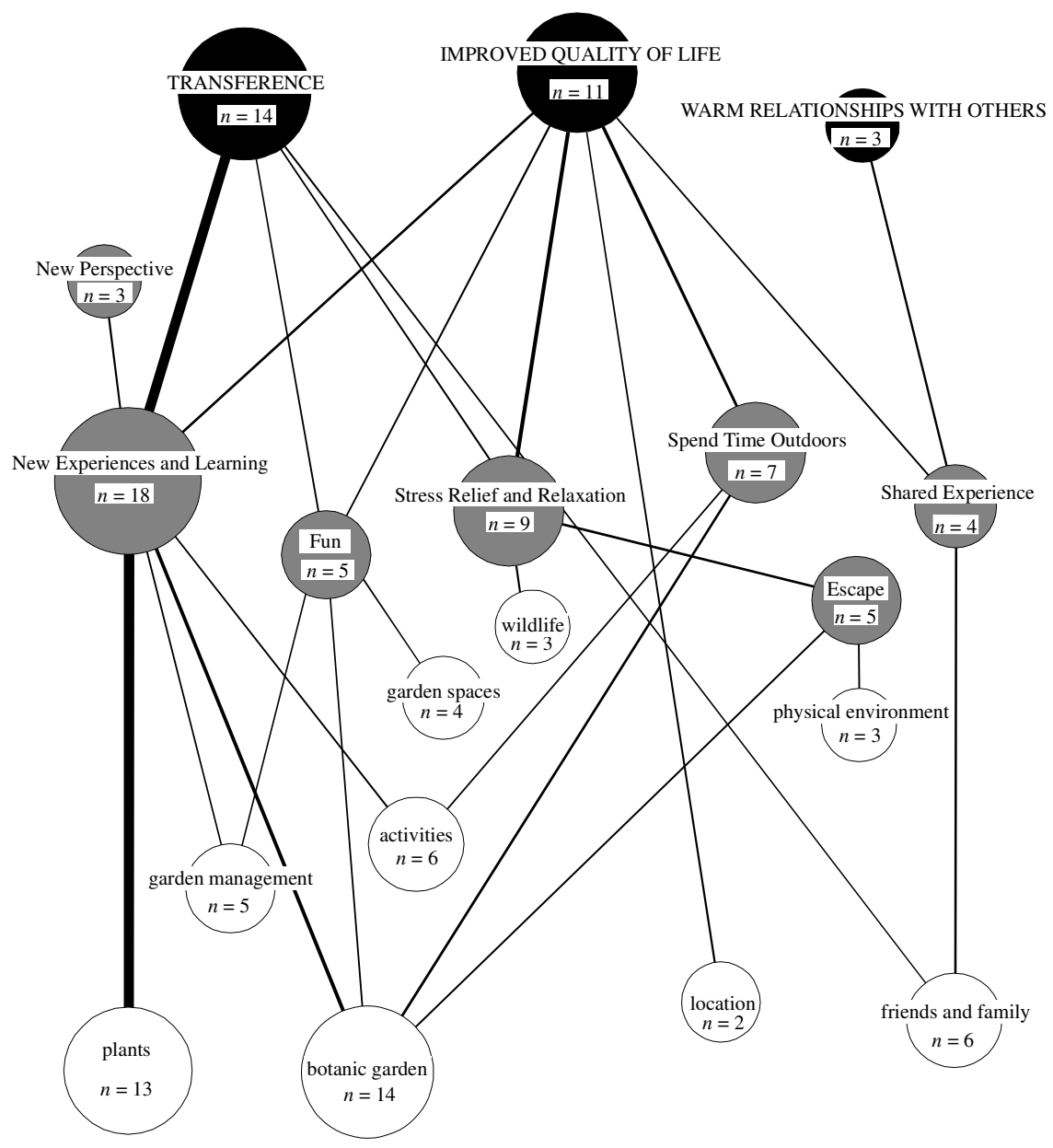
Figure 4.11. Hierarchical Value Map for Participants between ages 31 and 49 (*N* = 18)

Figure 4.12 is the HVM for ladders of visitors over the age of 50 (*n=31*). This

HVM used a cutoff of 2, representing 78% of the data. The most frequently mentioned

attributes were *botanic garden* (*n=22*), *plants* (*n=18*), and *activities* (*n=10*), and *garden*

spaces (*n=10*). The attribute *friends and family* was not present in this HVM. The most

frequently mentioned consequences were *new experiences and learning* (*n=26*), *stress*

relief and relaxation (*n=19*), and *fun* (*n=12*). The most frequently mentioned values

were *transference* (*n=21*), *improved quality of life* (*n=16*), and *fun and enjoyment of life*

(*n=9*). There were meaningful links between the following attributes and consequences:

botanic garden and *escape*, *garden spaces* and *new experiences and learning*, *physical*

environment and *stress relief and relaxation* and *garden management* and *new*

experiences and learning. There were also meaningful links between the following

consequences: *escape* and *stress relief and relaxation*, as well as *new experiences and*

learning and *new perspective*. There were two meaningful consequence to value links,

one between *fun* and *transference* and one between *stress relief and relaxation* and
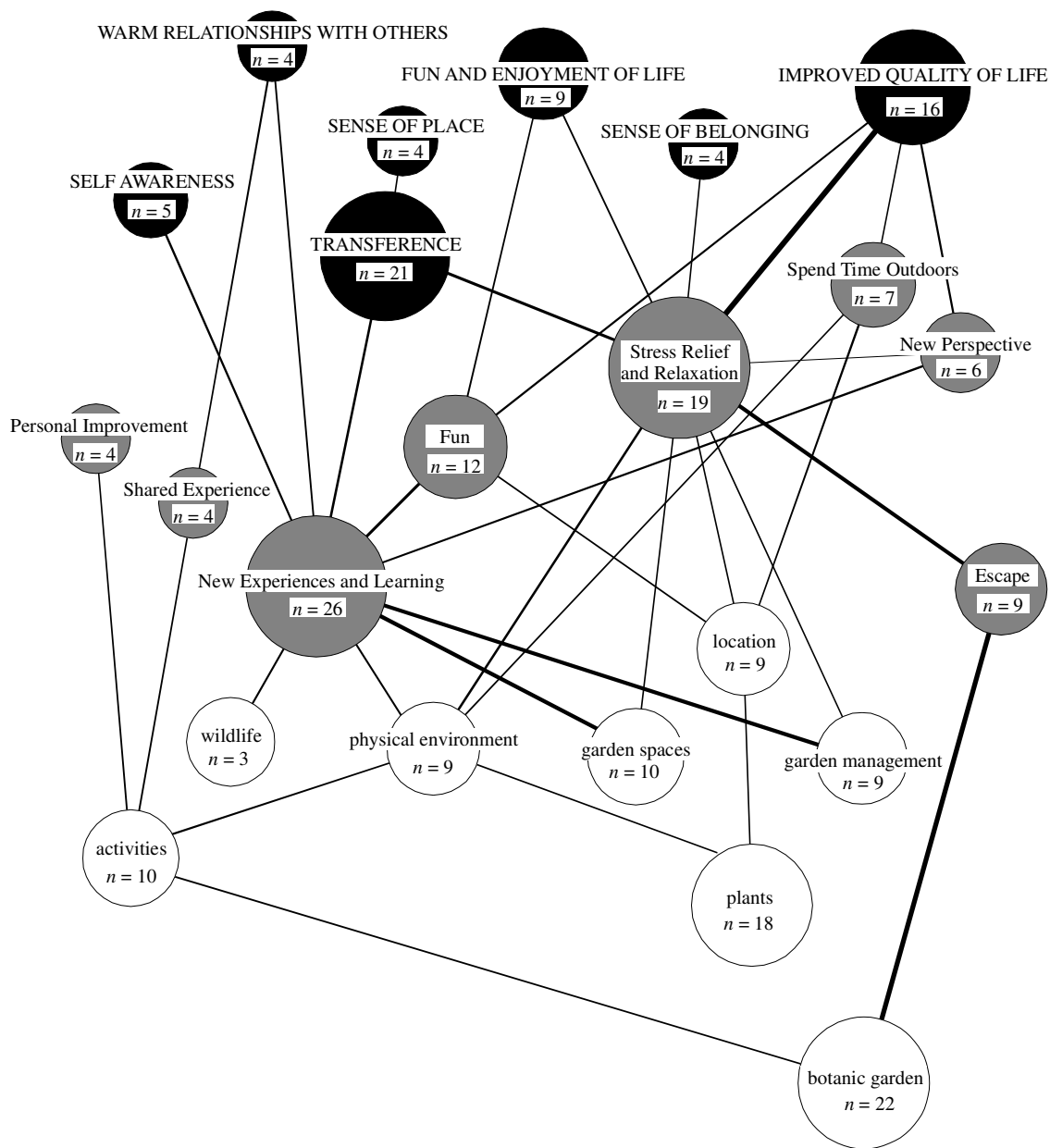
improved quality of life.

Figure 4.12. Hierarchical Value Map for Participants Over Age 50 (*N* = 31)

Summary

The results of this study indicate that *botanic garden* and *plants* were the most frequently mentioned attributes. The majority of participants revealed that the two most frequently mentioned consequences were *stress relief and relaxation* and *new experiences and learning*. Additionally, the values *transference* and *improved quality of life* were discussed by the majority of the participants. The final chapter offers discussion and interpretation of these results, as well as practical and theoretical implications, study implications, and recommendations for future research.

CHAPTER 5

DISCUSSION

The purpose of this study was to gain a better understanding of botanic garden visitor outcomes. This chapter will review methodology, summarize study results, and discuss these results in relationship to prior research. Research implications will be explored and suggestions for future research will be given.

Summary

The purpose of this study was to gain an understanding of the outcomes using means-end theory that *Leaning Pine* Arboretum visitors experience from visiting the botanic garden. This study used means-end theory to research the attributes, consequences, and values associated with a visit at the *Leaning Pine* Arboretum. Laddering interviews were conducted during the summer of 2011. Interviews were recorded and data were entered into LadderMap software program, where content codes were applied. Intercoder reliability was conducted. Implication matrixes were generated, and hierarchical value maps were developed to create a graphical interpretation of the data.

Results of this study indicate that the subjects experience personal value attainment as a result of visiting the *Leaning Pine* Arboretum. Study results offer insight into *Leaning Pine* Arboretum visitors' experiences at the botanic garden. This section addresses the six research questions related to attributes, consequences, and values (ACV's) that result from visits to the *Leaning Pine* Arboretum.

Research Question One: What are the attributes, consequences, and personal

values of *Leaning Pine* Arboretum visitors? After compiling research data on attributes of

a typical garden visit, *botanic garden* was cited most often. This result indicates that the

richness of the entire visit may be difficult for visitors to reduce into categories.

However, participants did indicate that the plants throughout the garden make up a

meaningful attribute of their experience. The remaining seven attributes, while

distinguishable, were not mentioned by the majority of visitors. Following a similar

pattern, the majority of participants cited two consequences *stress relief and relaxation*

and *new experiences and learning*. *New experiences and learning* was cited by 86% of

the participants, indicating that the majority of visitors experience opportunities to

acquire knowledge. A strong link led from *new experiences and learning* to *new*

perspectives, which then led to the value *transference*, demonstrating the participants'

ability to take a new piece of knowledge, adapt their thinking, and apply it to other areas

of their lives. Additionally, more than half the visitors found that they experienced

opportunities for relaxation and stress reduction.

Interestingly, the strongest link between concepts in the findings was the

consequence *escape* leading to *stress relief and relaxation* in the HVM for all

participants. This link indicates that when an individual feels away from society it

allowed the participants to experience increased levels of relaxation, which frequently

allowed them to return to the busyness of their lives feeling recharged. This idea was

illustrated by a participant who said "It allows me to get away for an hour during the day.

I feel more energized when I get back to my office, I feel like I am more productive."

The remaining five consequences were not mentioned by the majority of participants.

This pattern continued through value attainment, as the majority experienced *transference* and *improved quality of life*. Through *transference*, the majority of the participants indicated that they would transfer the benefits and outcomes from their visit to other areas of their lives, often this was applying newly gained knowledge about plants or new plant species to inform personal or business landscape designs, as well as to academic courses. Just over half of the participants experienced *improved quality of life* as a result of *transference*, which shows how participants believe that application of outcomes and benefits positively changes their lives.

Research Question Two: What are the differences between student and non-student visitors' attributes, consequences, and values? The mean age of the student population was 23.78 years old, while the mean age of the non-student population was 48.84 years old. For non-students, the third most frequently mentioned consequence was tied between *spend time outdoors* and *escape*. Although students also mentioned *escape,* this was not one of the three most frequently mentioned consequences. Additionally, the non-students indicated that their garden visit allowed them to experience *fun and enjoyment of life*, which was their third most frequently mentioned value. This contrasted with the students, who did not report *fun and enjoyment of life* as a value obtained from their garden visit. While both populations experienced *stress relief and relaxation*, it was part of the strongest concept link for students, who used *stress relief and relaxation* to attain *improved quality of life*. Perhaps students would define *fun and enjoyment of life* as being more intensive social experiences, like a party or a sporting event, where as a visit to the arboretum is a chance to slow down and relax during a busy day at school, leading to *stress relief and relaxation* and ultimately an *improved quality of life*.

For non-students, *new experiences and learning* was a central concept, linking with all but one attribute and leading to all but one value. This consequence had meaningful links with *garden management, garden spaces,* and *new perspectives.* While *new experiences and learning* was also an important consequence for students, overall, this population had greater variety in means-end chains and value attainment.

Research Question Three: What are the differences between male and female visitors' attributes, consequences, and values? While males and females share the same two most frequently mentioned attributes, consequences and values, there was differences in the third most mentioned attribute, consequence, and value. The third most frequently mentioned attribute for females was *activities* and *garden spaces* for males. The third most cited consequence was *escape* for males and a tie between *spend time outdoors* and *fun* for females. For values it was *self-awareness* and *fun and enjoyment of life* tying for females and *warm relationships with others* for males. For females, botanic garden connected with three different attributes, including a moderate link with activities. While *stress relief and relaxation* was important for both males and females, how they arrived there was different. For females *spending time outdoors* increased their ability to experience relaxation, while for males relaxation was a result of escaping from society. Both males and females achieved the value of *fun and enjoyment of life*, but again they arrived there by different means. Females gained *fun and enjoyment of life* after experiencing *stress relief and relaxation*, while males experienced *fun* and then gained *fun and enjoyment of life*, suggesting that for men fun begets more fun. All but three concepts on the females HVM connected with *stress relief and relaxation*, which greatly

contrasted with the males HVM, which only connected *stress relief and relaxation* with seven concepts.

The central difference between male and female visitors is rooted in how *stress relief and relaxation* plays and integral role in allowing women to achieve values associated with visiting the botanical garden. This is not to minimize the importance role stress relief plays for males, who needed to experience this to have *new experiences and learning*, which led to attainment of two separate values.

Research Question Four: What are the differences between on and off campus visitors' attributes, consequences, and values? For participants that work and/or go to school off campus *fun and enjoyment of life* was one of the most frequently mentioned values. This value was mentioned the least number of time by those participants that work and/or go to school on campus. For those who do work and/or go to school on campus, there is an important means-end chain that leads from *escape* to *stress relief and relaxation* to *improved quality of life*.

Clearly, the botanic garden experiences are valuable to both populations. However, for those on-campus visitors, the botanic garden may provide a place to get away from work and scholastic stress while remaining on-campus. This time away seems to reduce stress and allow participants to better their lives. For those who come from off-campus, the botanic garden may be a destination, or enjoyable place to visit, that allows for more fun in life.

Research Question Five: What are the differences between first time and return visitors' attributes, consequences, and values? Participants that were interviewed during their first visit to the *Leaning Pine* Arboretum did not mention the following concepts:

wildlife, physical environment, personal improvement, self-awareness, and *sense of place*. First time visitors made strong links between *plants* to *new experience and learning* and then to *transference*. However, for participants that had previously visited the botanic garden, all means-end chains began with the attribute *botanic garden* and the strongest link between concepts lead from *escape* to *stress relief and relaxation*, which did not exist for first time visitors. It is reasonable to assume that first time visitors come to see the plants and learn about them, and it may be possible that after experiencing the atmosphere of the botanic garden some visitors return specifically to get away from the busyness of society in order to relax.

Research Question Six: What are the differences between visitors of different ages attributes, consequences, and values? *Friends and family* was one of the most frequently mentioned attributes for participants aged 31-49. This attribute was not mentioned by participants over the age of 50 and was not one of the most frequently mentioned attributes by participants under the age of 30. *Fun and enjoyment of life* was one of the most frequently cited values for participants over the age of 50 but was not a top value for either of the other two age group populations.

The opportunity to see new plants, acquire new knowledge, and use this knowledge in other areas of their lives was a dominant theme for participants aged 31-49. For the participants under the age of 30 and over the age of 50, their botanic garden experiences lead to a greater variety of links between concepts and value attainment. The strongest link for participants under the age of 30 was between *escape* and *stress relief and relaxation*.

Discussion and Theoretical Implications

This section discusses the findings of this study in relationship to the existing

body of literature. The results from this study suggest that the participants in this study

differ from botanic garden visitor demographics in prior studies by Connell (2004) and

Ward et al. (2010). These researchers found that the majority of botanic garden visitors

were white, middle-aged to over 50, in higher income brackets, and possess white-

collared jobs. The participants in this study are also mainly white; however, the many of

participants were students, who often were unable to provide their household income.

The difference in visitor demographics can most likely be attributed to the fact that the

Leaning Pine Arboretum is located on the California Polytechnic State University college

campus in San Luis Obispo, California.

Although this study did not measure visitor motivations, some of the attributes

and consequences related to a visit to the *Leaning Pine* Arboretum found in this study

align with visitor behaviors and motivations reported by Connell (2004). These

similarities include interpersonal pursuits and activity based behaviors (*activities;*

personal improvement) and contemplative activities (viewing *wildlife* and *plants; spend*

time outdoors; stress relief and relaxation). Visitor motivations included social

motivations (*friends and family; shared experiences; activities*), horticultural motivations

(*plants; new experiences and learning*), and setting related motivations (*location;*

physical environment; garden spaces; escape; spend time outdoors). Even though the

interview questions in this study did not specifically ask participants about their

motivation for visiting the botanic garden, the aspects that the participants described as

important were similar to the motivations reported by Connell.

Connell (2005) indicated that gardens provide tranquil leisure spaces. Her statement parallels this study's findings that participants experience the consequence *stress relief and relaxation* as a result of spending time at the *Leaning Pine* Arboretum. A 19 year-old male (participant #57) said "I realized that that little place over there really felt, like, calm, brought peace, felt good. I guess I like to find a little spot to relax, and that felt like my spot right there." Similarly, these findings validate results from Kohlleppel et al. (2002), Mahler et al. (2005), and Holbrook (2010) who found that visiting botanic gardens can serve as a coping strategy for dealing with and reducing visitors' life stress.

Additionally, Connell (2005) suggested that at gardens, visitors can withdraw from the busyness of modern life. One of the most frequently mentioned consequences was *escape*, which is illustrated by one 22-year-old male (participant #56) who said that the arboretum "feels open, not cramped. In my mind, that's part of being outdoors…outside you want to be free, open…I enjoy it, kind of going your own pace." Such results from this study are in agreement with her conclusions, as participants frequently indicated that the *Leaning Pine* Arboretum allowed them to find refuge from crowds, work, stress, and technology. For example, a female 21-year-old female (participant #37) said, "People need a place to come and enjoy nature and have a space where people aren't constantly interrupting you."

In prior studies, botanic garden visitors expressed greater interest in mentally and emotionally restorative activities than in educational horticultural pursuits (Ballantyne et al., 2008; Nordh et al., 2011). Ward et al. (2010) reported that return visitors to botanic gardens were more interested in relaxation than education. Results from this study

deviate from these findings as relaxation, mentally and emotionally restorative activities, and horticultural learning appear to have similar importance to many study participants. Findings show meaningful links between the consequence *stress relief and relaxation*, and the value *improved quality of life*, as well as meaningful links between the attribute *plants*, the consequence *new experiences and learning* and the value *transference*. These links are supported by a quote from an older than 50-year-old female (participant #35) who explained that the arboretum "is always a place of peace and quiet and I come here for ideas for my own garden and to see what's blooming, to learn more about plants. It's a learning environment for me too."

Burgess et al. (1988) found that visiting public outdoor green spaces led visitors to experiences greater exposure to natural spaces and to have meaningful experiences with others. This study found important links between the attribute *friends and family*, the consequence *shared experience*, and the value *warm relationships with others*. For example, one 42-year-old female (participant #54) spoke about how visiting the arboretum is a "time where all the noise and everything slows down, to be near nature…to have time to interact…with grandpa and grandma and our cousins."

Connell (2005) found that gardens can offer spiritual satisfaction to visitors. In this study, some participants did mention aspects of spirituality; however, spirituality was not discussed by enough participants to remain as a separate content code during the intercoder process. Depending on the context of the individual participant's interview, references to spirituality were coded into the following values: *improved quality of life, transference,* and *self-awareness.*

In addition to expanding on the benefits of visiting botanic gardens, this research adds to the literature that explores the application of means-ends theory to the field of outdoor recreation. Similar to other means-end study results, the majority of ladders in this study repeatedly mentioned the same attributes, consequences, and values (Frauman & Cunningham, 2001). Gomez et al. (2010) found that while there were significant links between attributes, consequences, and values, there were not significant differences in attribute, consequence, and value attainment based on participant type. The results from this study were similar, as there were no differences in the two most frequently reported attributes, consequences, or values based on participant type, however, overall outcomes did vary between subgroups. This study continues the increasing research into using means-end theory to explore recreation experiences (Goldenberg et al., 2000), and found that visiting a botanic garden as a recreational pursuit leads to values that improve people's lives.

In the larger body of outdoor recreation, Manning (1999) described the "personal, social, economic, [and] environmental" recreation benefits as "somewhat abstract… difficult to measure and associate directly with recreation participation" (p. 159). This study utilized means-end theory to investigate the relationship between participation in a recreational visit to a botanic garden and the benefits or outcomes of that visit. The results from this study suggest that means-end theory does enable researchers to associate recreation benefits directly to recreation participation.

Similar to results from Frauman and Cunningham's (2001) means-end study, the results of this research indicate that botanic garden attributes can lead visitors to attain their personal values. The success of these research studies confirms the value of the

application of means-end theory research for studies on botanic garden visitor outcomes. Validating McIntosh and Thyne's (2005) assertion, means-end theory allowed participants to focus the interviews on the aspects of their visits that they determined to be the most important to their experiences and interests. Furthermore, this study adds to the literature that uses means-end theory to examine the macro benefits of outdoor recreation (Goldenberg et al., 2000). The results of this study reveal how recreational visits to a botanic garden can lead to value attainment that improves visitors' lives beyond their visit. This finding continues to validate the usefulness of applying means-end theory to outdoor recreation studies.

Practical Implications

This section offers management implications for the *Leaning Pine* Arboretum, however some of the implications may be useful to management staff of other botanic gardens, particularly those that serve university and local community populations. Based on results of this study, garden staff and managers should focus on two major areas, providing a rich overall experience and a healthy, interesting, and diverse collection of plant material reflective of organizational goals. Gardens should be immersive experiences, with design aimed at secluding visitors from the outside world and creating an environment that is conducive to relaxation and education. Based on differing needs of visitors, the garden should provide educational opportunities to those seeking knowledge, while maintaining a calm and unobtrusive atmosphere for those seeking rest, relaxation, and an escape from studying and work.

Educational opportunities in a garden are enabled by several different garden management factors. A well labeled collection is at the core of any botanic garden, and consistent, high quality, and unobtrusive signage that is not overwhelming is integral to successful garden management. An extensive collection of plants and well-designed garden spaces increase the possibility of introducing visitors to new plants and to provide learning opportunities. Accommodating activities, such as guided tours, self-guided tours, and classes, allows visitors to gain additional and in-depth knowledge.

Managing a garden to promote rest, relaxation, and the ability to escape from the outside world can be promoted by using electric or hand powered tools, and conducting high impact maintenance activities when few or no visitors are present. Dividing garden spaces into more intimate vignettes can allow visitors to find their own favorite spot and experience a sense of seclusion, even when others are nearby. Designing to create areas of shade and sun, open and densely planted spaces, and incorporating natural sounds like moving water can enhance the physical environments that can promote stress relief. Furthermore, gardens surrounded by urban areas can bring wilderness like natural experiences to visitors, and create a sense of escape to an idealized faraway environment.

Study Limitations

Data collection occurred during the late spring and early summer of 2011, during the summer academic break. The study location was on a university campus, and the study participant demographics may not be comparable to those of other botanic gardens. Collecting data at this time could have impacted the results of the study, as the majority of students had left for the summer and were unable to participate in the study. Some

participants refused to be tape recorded, so their codes came from research notes. Other participants may have been cautious when speaking because of the tape recorder. Both male and female researchers conducted interviews, and this may have affected participant comfort level and led to different responses. In order to include the greatest number of participants, convenience sampling was employed rather than using random probability sampling procedures. Some HVMs had small sample sizes smaller than 40 participants, possibly making the data less reliable. The demographic information categories "Annual Household Income" and "Occupation" were given as open-ended questions and resulted in data that was challenging to analyze as answers were not provided in standardized intervals. As a result these categories were not analyzed.

Future Research

While this study generated new understandings about visitors to botanic gardens, it also highlighted areas for additional studies. Interview transcripts from this study could be analyzed to gain a deeper understanding of visitor outcomes. Repeating the study using different sampling methods, such as random probability sampling could increase the validity and provide data triangulation. Stratified sampling could be used to increase sub-population levels to make more comparable sample sizes. The study could be repeated when the university is in session to see if results are affected. Future research could explore if outcomes that are attained align with visitor motivations. This study could be replicated at other botanic gardens that serve different audiences or feature different landscapes and collections. Additionally this study could also be repeated as a comparative study between two botanic gardens. Finally, other research could study

botanic garden visitor outcomes using motivation and benefit scales previously validated

in outdoor recreation studies, such as those discussed by Manning (1999) and Driver,

Tinsley, and Manfredo (1991).

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APPENDICES

Appendix A: Interview Script

Research Protocol:

Botanic Garden User Outcomes: A Means-End Investigation

Recreation Parks and Tourism Administration Department

Christopher Wassenberg, Primary Investigator

Dr. Marni Goldenberg, Faculty Advisor

INTERVIEW SCRIPT

"Hello and welcome to the *Leaning Pine* Arboretum, my name is

_____ and I am conducting research on botanic garden user

outcomes. Would you be interested in taking part in a short anonymous interview to

explore your reasons for visiting today and what benefits you received from your visit?"

If no:

 "Thank you and enjoy the rest of your visit."

If yes:

 "Before we start please read this informed consent form, and feel free to ask me any

questions about it."

"I'm going to turn on the recorder now and begin the interview."

"First I would like to ask several background questions."

"What is your gender?"

"What is your age?"

"What ethnic group do you most identify yourself with?"

"Are you a student?"

If yes:

"What school do you attend?"

"Do you work here at Cal Poly?"

If yes:

"Staff or faculty?"

"What city do you live in?"

"How many times have you visited the *Leaning Pine* Arboretum?"

If a regular visitor:

"How often do you visit?"

---Begin Formal Interview---

"Can you tell me three things you experienced during your visit to the *Leaning Pine* Arboretum today?"

Participant responds and researcher selects an aspect and begins asking participant:

"Why is that aspect important to you?"

The Researcher repeats key component of answer and rephrases it into a question:

 "Why is that important to you."

This line of questions continues until the subject cannot provide an answer.

The interview is completed by saying:

"Thank you for taking part in our study, our research should be complete in fall of 2011

and you can contact us if you are interested in our findings"

(Contact information on informed consent form).

Appendix B: *Leaning Pine* Arboretum Visitor Survey

Leaning Pine Arboretum Visitor Survey

Participant Number: _____

Gender: Male   Female

Age: _____

Are you a student? Yes   No

    If so, where do you go to school: _____

What is your occupation? _____

    Do you work on campus? Yes   No

What is your ethnicity? _____

Where do you live? _____

How often do you visit the *Leaning Pine* Arboretum? _____

What is your household income? _____

Thank you for participating!

Appendix C: Informed Consent Form

Informed Consent Form

INFORMED CONSENT TO PARTICIPATE IN:

Botanic Garden User Outcomes: A Means-End Investigation

A research project on botanic garden user outcomes is being conducted by Christopher Wassenberg in the Department of Recreation Parks and Tourism Administration at Cal Poly, San Luis Obispo. The purpose of the study is to gain an understanding of the outcomes and benefits that *Leaning Pine* Arboretum users experience from visiting the botanic garden.

You are being asked to take part in this study by participating in a short one on one interview. Your participation will take approximately 15 minutes. Please be aware that you are not required to participate in this research and you may discontinue your participation at any time without penalty.

There are no risks associated with this study. If you should experience emotional distress or other problems please be aware that you may contact Psychological Services at (805) 756-1211 for assistance.

Your confidentiality will be protected by conducting the interview anonymously. Potential benefits associated with the study include understanding what attributes of a botanic garden lead to the greatest benefits for users, and thus help botanic gardens create better user experiences.

If you have questions regarding this study or would like to be informed of the results when the study is completed, please feel free to contact Christopher Wassenberg or Dr. Marni Goldenberg at (805) 756-7627. If you have questions or concerns regarding the manner in which the study is conducted, you may contact Dr. Steve Davis, Chair of the Cal Poly Human Subjects Committee, at (805) 756-2754, sdavis@calpoly.edu, or Dr. Susan Opava, Dean of Research and Graduate Programs, at (805) 756-1508, sopava@calpoly.edu.

If you agree to voluntarily participate in this research project as described, please indicate your agreement by signing below. Please keep one copy of this form for your reference, and thank you for your participation in this research.

_____   _____
               Signature of Volunteer   Date

_____   _____
               Signature of Researcher   Date