Chapter 9
City Trees and Consumer Response in Retail Business Districts

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ABSTRACT
Many cities and communities are working toward urban sustainability goals. Yet, retailers and merchants may not find environmental benefits to be compelling when compared to the direct costs of landscape and trees. Nonetheless, a quality outdoor environment may provide atmospherics effects that extend store appeal to the curb and heighten the positive experiences and psychological reactions of visitors while in a shopping district. A multi-study program of research shows that having a quality urban forest canopy within business districts and commercial areas can promote positive shopper perceptions and behavior. Positive responses include store image, patronage behavior, and willingness to pay more for goods and services. This chapter provides a summary of the research, connects results to psychological marketing theory, provides evidence-based design recommendations, and makes suggestions for potential future research activity.

INTRODUCTION
In recent decades researchers have explored the connections between store environments and shopper activity. Many retailers and merchants use evidence-based strategies to enhance shoppers’ experiences. Interior design, product integration and placement, the appearance and behavior of sales associates, and even the choice of background music are implemented and tweaked to influence consumer behavior. Retail establishments from small independent shops to chain department stores work to make the shopping environment alluring, comfortable, and profitable.

Meanwhile, gardeners and philosophers have celebrated the pleasures of trees and nature for centuries, noting the role of plants in aesthetics, cultural symbolism, and therapy. Recent research confirms the benefits that people gain from nature experiences. However, the two research pursuits – investigations of human experiences of retail place and studies of nature settings – have rarely intersected.

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City trees provide many environmental benefits such as clean air and water, reduced heat island effects, and reduced energy usage. Yet merchants often do not find such benefits compelling. To address the more direct interests of retailers a series of studies has explored both business peoples’ attitudes about trees and shopper response to urban forest canopy. The research results make the case for the importance of business investment in a tree program, in order to address urban sustainability, but more importantly, to enhance the appeal and success of business centers in cities and towns.

This chapter builds the case for the importance of having trees and quality landscapes in retail settings. The first sections address the broader issues of urban sustainability, retail settings, and recent research about urban forest benefits. A background section then presents the psychological theory about people’s response to place, retail settings, and nature. A program of research studies has explored how business district visitors respond to city trees; key findings are summarized. A research discussion section is followed by guidelines for urban forest planning in contemporary shopping environments. This presentation of theory and research presents several research opportunities, the focus of the last section in the chapter.

**ISSUE: RETAIL ENVIRONMENTS AND SUSTAINABILITY**

Local governments are increasingly interested in pursuing urban sustainability goals. Science, technology, and professional best practices have evolved to integrate natural systems and elements into the basic functions of cities and towns. Yet not all property owners are necessarily committed to ecology and landscape development for the sake of sustainability. For instance shop owners within the retail and commercial districts of cities often lament the dis-services of street trees and vegetation, calling out the costs and annoyances of blocked signs, debris, and sidewalk damage. These practical concerns often lead to plans and practices that preclude plantings, in the belief that open, clear streets provide optimal shopping environments.

The basis of consumer behavior has changed in recent decades. While the retailer-consumer relationship still involves rational economic transactions, it also includes a variety of non-economic factors. Shopping has become much more than an activity of necessity, and now has leisure and entertainment components. The aspects of the retail environment that attract customers and encourage them to purchase are not fully understood. Behavioral economics and neuromarketing are emerging fields of study that pursue better understanding of economic and retail behavior.

Facing competition from online and big box competitors, many merchants in local and neighborhood shopping districts give greater attention to the quality of experience in their shop and customer service. Curiously, in many instances the attention to retail experience and place does not extend beyond the front door. On approach a customer encounters blank walls, barren sidewalks, and large paved areas devoted to parking. The appealing retail experience that is carefully cultivated within the store is often absent at the curb and other outdoor areas of the business district or site.

Central business districts are the retail and civic centers of many urban neighborhoods and smaller cities. As business associations implement district improvements and strategies to attract and retain shoppers, some retailers may overlook the importance of a quality streetscape on visitors’ encounters with a business district. The direct costs of an urban forest improvement program can be readily tallied; assessing the consumer response benefits is more difficult. Yet, trees and landscape are playing an ever more important role in urban quality of life.
BACKGROUND: BENEFITS AND FUNCTIONS OF URBAN FORESTRY

Aesthetics and beauty are probably the most commonly described benefits of city trees, parks, and gardens. Tree plantings have historically been an important element of beautification programs in cities throughout the world. Yet recent science indicates that decisions to plant and manage trees should not be based only on aesthetics, as urban forestry and greening provide many citywide benefits. Here are key findings from recent research.

Ecosystem Services

The term ecosystem services (ES) has evolved to describe the full scope of nature’s contributions to human health and welfare. ES are defined as those conditions and processes by which natural ecosystems sustain and fulfill human life. Economists have used the concept of ecosystem services for decades, but it really gained momentum in the 1990s after a key paper was published in the journal Nature (Costanza et al., 1997). The article defined ES and tackled the ambitious goal of providing an economic estimate, suggesting that all services across the planet tallied up to an average annual value of USD $33 trillion.

Natural assets, such as forests, agricultural lands, shorelines, and seas, have been the sources of essential and economically valuable goods and services throughout human history. Products such as timber, grains, and fish are readily bought and sold in markets. ES also includes natural systems benefits that have economic consequences, but setting their values is more difficult. Examples include flood protection, pollinator activity, natural filtering of potable water, and climate stability. Generally, ecosystem services arise from broad systems of ecological components, processes, and functions, but the term specifically signifies aspects of ecosystems that are valued by people. Recent research in urban forestry and urban ecology has yielded important insights about the functions of natural systems within cities.

Environmental Benefits

Trees are major contributors of environmental services (Chen & Jim, 2008; Wolf, 2013). Trees modify local microclimate to improve living conditions, including changes in solar radiation, wind speed, air temperature, relative humidity, and re-radiation from paved areas. Urban greening also improves air quality, as plant foliage enables beneficial gaseous exchange and intercepts polluting particles. Urban vegetation positively affects water quantity and quality, as the pervious soils of planted areas allow infiltration of precipitation, reducing runoff and increasing groundwater recharge. Soils and vegetation can also retain water pollutants, thus improving water quality by mitigating nonpoint source pollution. Climate and energy effects are additional benefits. Strategically placed trees within residential areas can reduce heat gain, thus reducing household energy consumption. Scaling up, areas of substantial tree canopy across a city can produce an oasis effect in hot climates, contributing to mitigation of the urban heat island effect, perhaps a more immediate threat in some cities than climate change.

Health and Well-Being Benefits

Many environmental services have health consequences, such as provision of clean air and water. In addition, nearly 40 years of research across multiple social science disciplines points to important psychosocial benefits (Wolf, 2008a; Wolf, 2012). Having trees and nature in cities satisfies basic human needs, improves livability, and enhances quality of life. Nature provides beauty and aesthetics in built environments, but is also profoundly important to human health and well-being. The evidence spans social scales from indi-
individual response to person-to-person interactions, to neighborhoods, to organizations, and to various types of communities. The studies document how nature contributes to human performance and functioning in everyday life, and address some of the most urgent issues of contemporary society, such as education performance, public health costs, therapy for emotional and physical disabilities (such as those experienced by veterans returning from deployment), and mental functioning of the growing elderly population.

While the experience of nature is not a panacea for the ills of society, extensive psychosocial research suggests that natural settings enable a positive response, better functioning, and healing. The Green Cities: Good Health Website (www.greenhealth.washington.edu) is a catalog of research about these social, economic, and cultural benefits, also termed ecosystem services (2013a). More than 2,800 peer-reviewed publications have been collected and sorted into topical themes. This knowledge shows why planning and management of urban forests, and urban greening more generally, are important to improve social capital and provide better human habitat.

BACKGROUND: PSYCHOLOGY OF ECONOMICS, RETAIL, AND NATURE

Shopping behavior is based on complex psychological interactions, and the physical environment can influence consumer motivations. Here are some of the psychological dynamics of consumer purchasing, including the role of physical environments. While city trees and landscapes provide wide-reaching benefits, the following concepts suggest how the experience of nature might contribute to consumer behavior in retail settings.

Psychology of Economics

Exciting new research and theory development has shifted how economists, financial planners, and retailers think about a person’s financial and purchasing actions. New perspectives about people and finances address actual (rather than assumed) behaviors and their psychological basis.

Behavioral Economics

The standard (neoclassical) economic analysis assumes that each person behaves in ways that maximize his or her individual self-interest, and does so by carrying out a fully rational analysis of all available options. This ‘rational man’ assumption has emphasized efficiencies in economic choices, yet recent research suggests that the premise has many shortfalls that can lead to unrealistic economic analysis and policy-making (Kahneman, 2003). Behavioral economics is a rapidly growing sub-discipline that seeks to increase the explanatory and predictive power of economic theory by providing it with more psychologically plausible foundations (Lambert, 2006). Early behavioral economists tended to emphasize the role of cognitive types of errors (such as framing effects and time discounting) in suboptimal decision-making. Recent research, however, points to the important role of affect in judgment and choice. Beliefs, emotions, and heuristics are at least partly responsible for expressions of human behavior. In addition, humans show enormous sensitivity to social influence, including attention to personal identity, social proof, and social learning. Within the last two decades assumptions about the sources of economic choice have diversified, and theorists are considering a broader potential range of influences on economic behavior.

Neuromarketing

Neuromarketing is the application of neuroscience and brain scanning in the context of economic behavior (Lewis & Bridger, 2005). This new applied field attempts to better understand how economic behavior is expressed within the complex interacting neural systems of the human
brain. Brain imaging has been used to evaluate response to video clips and TV advertisements, study decision-making among shoppers, and test the likely impacts of political advertising during elections. Though a relatively new science, neuromarketing research confirms the experimental observations of behavioral economics, showing that decision making can be understood as a process of resolution of different interacting, and often competing, specialized neural systems.

The brain has two key subsystems. The combined limbic and paralimbic system rules the intuitive and affective parts of our psyches and functions unconsciously. The analytic system of the frontal and parietal cortexes controls conscious thinking, such as information processing and future-oriented reasoning. Interaction of the limbic and analytic systems governs human decision-making. People appreciate their cognitive abilities, but the brain has been dependent on instinctual responses for millions of years, thus the most ancient part of our brain known as the R-complex or the reptilian brain, influences much of our behavior. This all suggests that emotions play a significant role in consumer choice mechanisms and at times there may even be disconnect between conscious reasoning and preference expressions (Morin, 2011).

**Place and Environmental Psychology**

Behavioral economics and neuromarketing acknowledge that economic behavior is supported by a variety of unexpected processes, in addition to rational choice analysis. Humans are remarkably efficient information processors, constantly seeking to make sense of the physical cues around them. Some of the earliest studies in environmental psychology explored how people comprehend place and built settings.

**Person/Environment Interactions**

Social scientists distinguish the physical-tangible aspects of an environment from interpersonal and sociocultural connections. For instance, some person/environment research is premised on stimulus-response assumptions, that is, immediate reaction to prompts in our surroundings. On the other hand, an interactional perspective (Stokols, 1978) suggests that response to environments arises from a person’s myriad assessments of a physical setting. Observers interpret rather literal characteristics of a place to make judgments of function (e.g. school vs. hospital) or wayfinding (i.e. how to efficiently navigate a space). Observers also make connotative or inferential judgments about the quality or character of a place and the people who inhabit it (Nasar, 1998). People cognitively overlay physical form with meanings or representations, integrating mediating information gained from observers’ prior experiences, social learning, and attitudes.

**Social Psychology**

The discipline of social psychology also offers insights for understanding the cognitive processes of place-based consumer response. Social psychology is defined by Brehm et al., (1999) as “the scientific study of how individuals think, feel, and behave in regard to other people and how individuals’ thoughts, feelings, and behaviors are affected by other people.” Social perceivers assemble various bits of information, and mediated by perceiver dispositions, form impressions of others. Leyens and Fiske, (1994) note that, “people continuously build impression theories and use them in their commerce with other people.” Observed traits are the indirect cues used to interpret feelings, personality, character and likely behaviors. Diverse information about a person is integrated to form a coherent impression and guide decisions about
how to interact with a person. Rapid cognitive assessment is the basis for inference and evaluation of new acquaintances. Built settings may evoke similar evaluative responses, as suggested by the research presented later in this chapter.

Retail Psychology

Shopping and purchasing involve complex cognitive processes, some of which the consumer is aware of while others are nonconscious (Veryzer, 1999). Brick-and-mortar retailers rely on the tangible, physical setting of their business to attract consumers to their products and services. Stimulus response marketing and retail science studies have mostly focused on store interiors. Might the streetscape and a lush tree canopy generate similar responses?

Atmospherics

Marketing researchers have explored the ‘atmospherics’ attributes of products and stores and have evaluated their role in consumer behavior. For instance, effects of store elements of music, lighting, color, scent, layout, signage and service staff are complex (Lam, 2001). Store environments can affect shoppers’ behaviors through responses of emotion, cognition, and physiological state. Pleasant store settings are significant predictors of willingness to spend time in a store and of intentions to spend more money than originally planned (Donovan et al., 1994). Interior elements contribute to store image; for instance classical music and soft lighting are associated with a high quality image. Evaluations are also influenced by elements that are perceived as cues of level of service, merchandise quality, and general characterization of store types. Actual environmental conditions, such as temperature and noise levels, affect one’s sense of comfort and can influence the amount of time spent in a particular environment.

Store Image

Retail cognitions include inferences and impressions of product or store quality that shoppers make upon experiencing store-based cues. A related cognitive dimension is store image, that is, the way in which a store is defined in the shopper’s mind, including not only a store’s functional qualities but also its aura or psychological attributes. An array of attributes that contribute to store image was identified by Lindquist (1975) and included physical facilities. Store image can influence a buyer’s mood, and thus enhance affiliative behaviors within the store; e.g., spending more time and money than planned, and intention to revisit (Smith & Sherman, 1993). Whereas intentional cognitive factors may largely account for store selection and for planned purchases within the store, emotional reaction to the store’s environment may influence unplanned purchasing, extra spending, and time spent inside the store.

Nature Psychology

Behavioral economics, supported by neuroscience studies, acknowledges the broader set of potential influences on everyday consumer behavior. Place and retail psychology studies confirm that perceptions about a shopping place (and associated behavior) are informed by physical features and place ambience, such as light, sound, and color. The role of nature in the perceptual mix has rarely been addressed in marketing research, yet studies in environmental psychology and allied disciplines show consistent positive human response to nature, trees, and landscapes.

Landscape Preference

Psychological assessments of urban landscapes indicate that aesthetic response is more than a mere reaction to what is beautiful or pleasant, but is one expression of a complex array of perceptual and cognitive processes (Kaplan & Kaplan, 1989).
Imbedded within visual preferences are reactions to cues that help one to make sense of an environment. Response to visual attributes is rarely neutral; there are often associated judgments and behaviors. Urban scenes containing trees (particularly large ones) are consistently highly preferred (Dilley & Wolf, 2013). Some investigations have assessed response of people to particular trees in close proximity. Others have evaluated the general meaning and values that trees represent for people in urban environments. Generally positive responses to the urban forest are associated with higher property values in those communities with large trees. Also, natural amenities positively influence the publics’ perceptions of urban place and function. The general public rates the benefits of urban trees highly (Lohr et al., 2004).

Biophilia

Another recent and emergent theory about human behavior is biophilia (Kellert & Wilson, 1993). The term refers to the innate emotional affiliation with natural processes and elements (such as trees and gardens) expressed by the human species. Biophilia is claimed to be the result of human evolution in natural environments, and our dependence on natural systems for food, water, shelter, and other basic needs. Although it is still uncertain as to what extent biophilia is hard-wired, numerous studies across a variety of disciplines (e.g. psychology, sociology, geography, anthropology, public health, epidemiology, and others) point to nature’s beneficial effects. Humans respond positively to natural elements within cities in terms of affect, cognition, and physiology (Wolf, 2008a).

RESEARCH: TREES AND RETAIL BEHAVIOR

Urban forest managers and advocates can now reference an abundance of studies that document the environmental services that urban forests provide. Yet business people often don’t consider such evidence to be relevant to the bottom line. What can justify investment in tree planting and management in the retail streetscape? Merchants are interested in the potential return from green investment.

The theory and concepts presented in the background section converge on the realization that consumer behavior is an expression of complex psychological interactions – not simply rational analysis – and that outdoor place and nature are probable influences. Premised on these ideas a series of studies explored the psychosocial response of shoppers to outdoor consumer environments (Wolf, 2004a; Wolf, 2005a). Surveys were used to evaluate how business district visitors respond to the presence of quality urban forest canopy.

A set of research questions guided each of the studies. We asked what might be the relationship between urban forest canopy, and:

- Visual quality, or the degree to which people judge a setting as pleasing and desirable;
- Place perceptions, meaning the mental representations or assumptions that one infers from an outdoor setting;
- Patronage behavior, including the stated frequency and duration of shopping actions, such as length of a visit, and;
- Price perceptions, represented by consumers’ willingness-to-pay for products and services.

Additional questions explored attitudes about benefits and annoyances that consumers may associate with trees, and how business people may differ from consumers in their preferences and attitudes toward trees. An overview of the results follows, with emphasis on the four core questions.
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Methods

Each study involved two sampling approaches. Sampling of retail environments included the “main street” business districts of large (Wolf, 2003a), mid-size (Wolf, 2004b) and small cities (Wolf, 2005b). Districts were selected based on architectural characteristics, status of revitalization programs, and socio-economic status of neighboring residential areas. Respondent sampling across the studies typically included randomly selected nearby visitors from within a buffer distance of the targeted business districts, and included people from multiple U.S. cities. Replicate studies also evaluated commercial areas adjacent to freeway roadides (Wolf, 2003b; Wolf, 2006) and small malls (Wolf, 2008b; Wolf, 2009a). Local collaborators made it possible for our research teams to sample business districts and associated users throughout the United States; their efforts were greatly appreciated.

Cited articles report the peer-reviewed, primary research and can be accessed for more detailed descriptions of methods. Generally, all surveys started with a preference rating exercise, presenting a set of images that depicted streetscapes with varying forest character, while minimizing the variation of other visual content. Each survey also contained streetscape scenarios “with trees” or “without trees,” and questions about a respondent’s projected shopping behavior while viewing one of the settings. Measures included rating scales as well as categorical responses. Surveys were randomly distributed among respondents by mail or during sidewalk intercepts. Analysis methods were also similar across each of the surveys. Preference means were calculated for each of the images (up to 35 visual stimuli per study), then image categories were prepared using factor analysis. For each of the scenarios, responses variables sets were first tallied, then combined using data reduction methods such as factor analysis to understand underlying categories. Finally, responses were compared for differences between commercial streetscape settings “with” or “without” trees. When appropriate, comparisons were also made between respondent subgroups, generally based on demographics.

Results and Findings

The results of the research program can help local resource managers and merchants to better understand, and reconcile, the tensions that are often associated with trees in consumer environments. This results summary reports trends and consistencies across the multi-study research program; again, details of findings pertaining to the respective urban retail settings can be found in the prior citations. Figures and tables present examples of findings within single studies, as well as across the different settings. Data analysis generally revealed consistently positive associations between streetscapes having trees, and consumer preferences, perceptions, and behavior.

Visual Quality

Image preference ratings sorted into three to five visual categories per study (each containing at least two images), with mean ratings ranging from 1.65 to 4.00 on rating scales from 1 to 5. Figures 1 and 2 show sample category images and mean preference responses across the studies. Within each study, consumer ratings increased steadily with the presence of trees. Images depicting business district settings having tidy sidewalks and quality buildings, but no trees, were at the low end of the scores. Images having well-tended, large trees received the highest landscape preference ratings, even though plants obscured other visual elements (such as historic buildings and signs).

Place Perceptions

While viewing one retail scenario (randomly presented), each respondent was asked to rate his or her level of agreement with statements about
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Figure 1. Image preference categories and mean ratings across multiple studies
Means (standard deviations) for categories from small +, midsize ++, and large cities +++.
Means for a total of 13 categories ranged from 1.65 to 4.00 on a rating scale of 1 to 5 (more information available in Wolf, 2005a).

the place using Likert scaled variables. Means for categories of items were compared between the forested and ‘no tree’ conditions (Table 1). Again, trees were associated with higher ratings of ‘amenity’ and ‘visual quality’ across the studies. Moving beyond the obvious visual content, the respondents made inferences about the settings. For instance, positive scores for maintenance were given to districts with trees, despite efforts to present the same level of building care and street tidiness in the study images. Respondents also attributed social traits and characteristics to in-store experiences. Judgments of products and merchants were more positive in forested places. This was also the case for inferences about product value, product quality, and merchant responsiveness. It seems that favorable expectations of shopping experiences are initiated long before a consumer enters the door of a shop.

Patronage Behavior

Study participants stated their patronage behavior with respect to travel to the business district, visitation patterns, and willingness-to-pay for parking while considering the streetscape scenarios. Responses were analyzed to evaluate the relationship between reported intentions and streetscape character. Responses on most patronage variables, across each main street study were found to be
significantly higher for “with trees” as compared to “without trees” conditions (Table 2). A distinct pattern of response was evident. Responses for settings “without trees” appeared concentrated at the lower end of each of the patronage variable’s values, while streetscapes “with trees” seemed to generate higher value responses. For example, respondents claimed they would travel farther to visit a business district having trees in both large and small cities. This could translate to an expanded trade area radius that adds thousands of people within urban population centers. Once there, survey respondents claimed they would stay longer, which may lead to greater sales revenues (Underhill, 1999).
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Product Pricing

A pricing assessment was done using contingent valuation to understand the impact of streetscape trees on price perceptions. Respondents were presented with a list of goods and services and were asked to state prices for each. The list contained products within different product classes that were supposedly offered for sale in the setting. Table 3 lists respondents’ valuations, and demonstrates the positive price effect associated with the presence of trees. There was some variability of price response between different sized cities, yet trees appeared to be consistently associated with higher price points. When standardized across all product categories and scenarios, the amenity margin for the presence of trees was 12% for large cities and 9% for small cities. The variation by city size may have been due to greater public appreciation for trees in big cities, may reflect differences in local economies of big versus small cities, or may be due to the economic downturn in the US that occurred in the period between the two studies.

Demographics Comparisons

Surveys included demographics questions. Survey participants in the large and small city studies were generally slightly older, somewhat more affluent, and less culturally diverse than the general U.S.

Table 2. Summary of patronage behavior responses across multiple study settings

<table>
<thead>
<tr>
<th>Patronage</th>
<th>Retail Setting</th>
<th>Large Cities with Trees</th>
<th>Mid-Sized City with Trees</th>
<th>Small Cities with Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Time</td>
<td>*more time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel Distance</td>
<td>*greater distance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of Visit</td>
<td>*more time</td>
<td></td>
<td>*more time</td>
<td></td>
</tr>
<tr>
<td>Frequency of Visits</td>
<td>*more frequent</td>
<td></td>
<td>*more frequent</td>
<td></td>
</tr>
<tr>
<td>Parking Fee WTP</td>
<td>*higher fee</td>
<td></td>
<td>*higher fee</td>
<td></td>
</tr>
</tbody>
</table>

Interval or categorical data were collected for each patronage variable.
WTP = willingness to pay, or respondent stated price.
Comparisons are between ‘with tree’ and ‘no tree’ district conditions across different city sizes using Pearson’s X² and Cramer’s V tests, statistical significance: *p<0.000, ^p<0.001.

Table 3. Summary of patronage behavior responses across multiple study settings

<table>
<thead>
<tr>
<th>Product Class</th>
<th>Setting</th>
<th>Large Cities *</th>
<th>Small Cities **</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Trees</td>
<td>With Trees</td>
<td>No Trees</td>
</tr>
<tr>
<td>Convenience</td>
<td>8.98 (2.74)</td>
<td>13.78 (5.00)</td>
<td>5.93 (3.09)</td>
</tr>
<tr>
<td>Shopping</td>
<td>33.52 (11.49)</td>
<td>47.36 (18.54)</td>
<td>69.42 (42.41)</td>
</tr>
<tr>
<td>Specialty</td>
<td>51.88 (18.30)</td>
<td>73.24 (30.79)</td>
<td>63.96 (26.78)</td>
</tr>
</tbody>
</table>

Mean (standard deviation) indicate comparisons on product classes by urban forest conditions for large cities (Wolf, 2003a) and small (Wolf, 2005b).
Values are $U.S., and indicate willingness to pay using respondent determined and open-ended pricing scales. Statistical significance: *one-way ANOVA, p<0.000; **independent samples t-tests, p<0.005.
Product classes (Kinnear et al., 1995):
1. Convenience goods are widely available and purchased with little deliberation.
2. Shopping goods are purchased after planning and comparison and are selectively distributed, and
3. Specialty goods have high brand recognition and consumer loyalty thus little comparison shopping is done before purchase.
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populace. Respondents in Athens, the mid-size city, were younger and had reduced household incomes, which is not surprising for a college town. Despite demographic differences among participants, the consistency of responses across all studies was remarkable; green shopping districts were consistently preferred (Wolf, 2007).

DISCUSSION: NATURE, SHOPPING ENVIRONMENTS, AND CONSUMER RESPONSE

A four concept framework guided the trees and retail research program – visual quality, place perceptions, patronage behavior, and price perceptions. The results demonstrate the potential value gained from a green consumer environment. The product pricing responses have been of greatest interest to merchant audiences, but other measures yield insights as to why shoppers may be willing to pay more for products in central business districts that have a quality urban forest. It is important to note that each of the studies asked participants to indicate their responses to entire districts, each having a unified character throughout, and not to individual merchants or shops that may or may not have fronting trees. Investing in district wide urban forestry improvements provide the perceptual richness and sense of place that trees can generate.

Looking across the research results we can infer why the research studies indicated consistent retail behavior responses in business districts across a continent and located in cities of different sizes. First, there is nearly forty years of evidence about the positive responses of people to experiences of nearby nature, that is, the everyday trees, gardens, and green spaces within cities, and one expression of the evidence is a biophilia hypothesis. The emergence of behavioral economics, supported by the objective observational brain imaging of neuromarketing, indicates that individuals’ decisions about purchases, personal finance, and investment are influenced by a broader spectrum of factors than has been acknowledged by the ‘rational man’ model, with emotion playing a key role.

The premises of person/environment interactions interject the possibility that physical form and the built environment can inform not only cognition, but may also evoke emotion through the symbols or representations of place, or the relative ease or frustration with which a person negotiates a space. Social psychological concepts of “social attribution” and “impression formation” readily translate to consumer/environment interactions. The positive responses to urban forest canopy in business districts is likely due to both the literal presence of trees as nature elements, and the emotional or cognitive sensations associated with movement through a pleasant consumer environment.

While behavioral economics attempts to articulate the underlying dynamics of macro-economics, it does so by way of the cumulative effects of millions of individuals’ decisions. Most of the studies and emerging principles of behavioral economics consider psychological functions of the individual, or social response where one interacts with individuals or small groups. Economic theory has rarely explored the role of one’s physical environment in financial decision-making and behavior. Few studies have analyzed the relationships between the attributes of one’s surroundings and how one considers, then acts on decision inputs, and how that changes across settings. For instance, might local climate or the conditions of one’s neighborhood be associated with financial behavior patterns?

Even fewer studies have explored the interaction of biophilia and commerce (Joye et al., 2010). It appears that trees are a significant atmospheric element of the business street, and are one of the first attributes of a business district that a visitor encounters. External conditions deserve greater attention, as store and shopping center exteriors present initial perceptual cues to consumers. Features such as storefronts, entrances, display
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Windows, building architecture, and parking lot character can create favorable or negative impressions that affect the frequency of return, amount spent during a visit, types of products purchased, and time spent at the shopping venue. These place elements must appeal to the shopper to induce approach behaviors for a retail store or service to be successful (Wolf, 2013b). In turn perceived service quality, emotional satisfaction, and positive image are key drivers of customer loyalty and recommendation (Ladhari, 2011).

RECOMMENDATIONS: TREES AND PLACE DESIGN

Trees and business research included interviews with independent merchants and managers of chain stores. The potential environmental benefits of having trees near their storefronts were of minimal interest to most. Rather, many called out the direct costs of tree planting and management, such as irrigation and pruning, leaf and debris removal, and infrastructure damage such as roots causing cracked sidewalks.

There are best practices and management strategies that alleviate such annoyances, optimize the benefits of city trees, and promote urban forest health. A comprehensive plan provides long-term guidance and continuity of care for trees that can live for decades. Good planning is more likely to support landscaping that can create positive shopper experiences, as a plan helps garner support from community members, boosts fundraising opportunities, and ensures that details are thought through. Following planning and planting, ongoing maintenance will ensure maximum benefit and cost control.

Trees are living resources that change in character and form over many years. This dynamic, living design element offers opportunities, but also can create tensions in the built environment. Here are guidelines for integrating trees into the retail streetscape (Wolf, 2009b).

Creating Place

Each tree species or cultivar has a distinct mature form, size, and other attributes. Plant selections can “brand” a place through subtle, yet observable, distinctions of texture, seasonal color, and plant massing (Figure 3). Within a shopping district diverse tree groupings and arrangement help a person distinguish sub-zones, thereby providing cues for orientation and wayfinding. Working within a selected plant palette, a landscape designer can promote variety within unity, creating a place perceived to be coherent overall and having distinctive features. Conventional planting patterns are one tree per every 30 linear feet (or more) of sidewalk. Variations on this basic pattern make a shopping district more interesting and unique. For instance, double rows of trees can be planted if sidewalks are wide enough. Mixed species provide interesting visual patterns. Understory plantings of flowers and shrubs add color and focal points.

Order and Tidiness

Survey respondents preferred scenes where vegetation is presented in patterns, and where there is order within the street scene. Careful and routine maintenance is also important as tidiness improves preference ratings across all landscapes. Again, there is more to this than meets the eye; during interviews shoppers claimed that the level of care for plants in the sidewalk zone provided cues about the level of care and customer service they might expect from nearby merchants.

Store Visibility and Trees

Merchants often express concerns about trees and visibility of their signs, awnings, and storefronts. Extra attention to design is needed to prevent such conflicts. Certain design principles can alleviate visibility issues. First, tree species choice is important. Trees with a more open and airy canopy, rather than a thick, dense canopy will permit bet-
City Trees and Consumer Response in Retail Business Districts

Figure 3. Retail place-making using trees and accessory vegetation: Chicago, IL; Seattle, WA; Austin, TX (photo credits: Kathleen Wolf)

Tree species with a mature height that is ultimately higher than sign heights are good choices. There are additional precautions as a tree grows. Ongoing maintenance should include pruning to guide the shape of the tree’s canopy and remove any limbs that might be hazards. As the tree grows, the canopy can be “limbed up” to raise branches and foliage above signs and storefronts. The canopy can also be opened up with selective pruning to allow sunlight to filter down to the sidewalk, making the street more pleasant for pedestrians. Tree topping is not the answer as it causes a flush of new branch and leaf growth that becomes a more dense visual obstruction. Repeated shearing of treetops causes poor tree health in the long run.

Signage and storefront design may also reduce visual conflicts. Color and materials choices for signs should contrast with foliage, drawing the eye to visual accents. Monument signage can be used to consolidate multiple scattered signs into a single streetside structure that is readily seen and understood. Perhaps “iconic” signage, using quickly interpreted symbols for goods and services, could be placed, reducing the need for multiple, large, highly individualized signs that take more time for passing motorists to comprehend. Indeed, traffic-calming approaches may be another solution, as drivers moving through a business district at high speeds may not notice signs no matter how visible.

Create Social Spaces

Shopping is often a social and recreational experience, shared with family or friends. Outdoor seating areas should be given careful thought. Randomly placed benches on the sidewalk may not be comfortable or visually appealing. Benches and custom seating can wrap around a tree pit or planter to give customers a sense of shelter while watching activity on the street. Trees and planters can also be used to perceptually break up a large paved area into a series of “rooms,” making the space feel more human in scale and welcoming (Figure 4). Such small spaces offer places of respite for extended district stays, or can be used for outdoor dining.

FUTURE RESEARCH DIRECTIONS

As cities pursue more sustainable practices, there is greater attention to urban forestry, park systems for health, green infrastructure, and other nature-based policies or programs. This book focuses on
one land use and activity within the broader context of cities – retail environments. While taking up far less land than other land uses in the typical city (such as residential or even transportation) the quality and character of a community’s retail centers reflect the identity of a place. There are two general domains of research opportunities that have direct consequences for retail settings and urban sustainability.

**Trees, Vegetation and Retail Behavior**

The results concerning retail perceptions, patronage, and willingness-to-pay are all based on self-report data. These outcomes could be validated in several ways. First, the studies relied on stated pricing and behavior; revealed willingness-to-pay studies rely on the actual price paid for market goods that have a specified level of an environmental attribute. A consumer price index approach that compares prices of a “basket of goods and services” across multiple places having or not having trees would be a more objective assessment of any amenity margin in retail pricing. Also, hedonic pricing could be used to capture value increments by comparing cohorts of districts that are similar, but differ on the character and quality of urban forest conditions. A natural experiment could be conducted in a single business district having trees if they are removed within a short time frame (e.g. following an ice storm or due to insect damage). Another important validation would be to compare actual on-site visual preference ratings with those expressed for photographic images. The self-report studies were conducted in urban neighborhood and ‘main street’ business districts; validation of the measures could be extended to other settings, such as malls of various sizes and indoor settings.

From a marketing perspective shoppers are diverse in goal orientation, socio-economic status, and retail product interests. Three general shopping motivations have been differentiated: functional, experiential, and social (Geuens et al., 2001). Individuals may have a prevailing motivational type, yet various shopping trips may be situational and connect to different motivations. An interesting marketing perspective is to empirically test how any specific shopping motivation or type of shopping is supported by streetscape characteristics, particularly tree canopy. Also, are there specific landscape attributes that both support the shopper’s intentions, and increase satisfaction with the product or service after the return home?

**Urban Forest Health and Sustainability**

The studies found that large trees were associated with the highest business district approval ratings, yet the built conditions of retail settings often present challenges that restrict tree growth. Paved areas have elevated ambient temperatures that can stress trees (and humans). Other challenges include limited root and canopy volumes,
compacted and low nutrient soils, water stress, and interactions with utilities. Pedestrians and passing vehicles pose daily risks in terms of tree damage and health. Additional research and technology development is needed to generate better knowledge about how to integrate trees into commercial settings, as well as all urban land use zones. While the general concepts of traditional forest management apply to city trees, the needs of particular urban circumstances (such as central business districts) merit dedicated science and best management practices.

Successful urban forest management entails direct costs while benefits are less readily measured, thus a process for benefit/cost analysis is another research opportunity. Forest planting, pruning, and care costs can be easily estimated. Results of the studies presented here could be used to calculate tentative fiscal benefits, and then used to estimate net value of trees in business districts, thereby determining a reasonable investment plan to support trees whose level of benefit increases over decades.

The presence of trees within retail environments suggests several research questions about sustainability, with consequences that extend beyond the immediate district. Merchant or business associations are instrumental in creating high quality green shopping areas, as improvements must be implemented across an entire district or mall. Once active in landscape improvements (and observing likely positive return on investment) might merchant associations be more inclined to commit to other district-wide (or city level) sustainability practices? Also, building owners are increasingly seeking sustainability certifications (such as LEED or SITES). Might forest management be included in their public messaging about green business practices, thus appealing to shoppers of certain demographics? Finally, might high quality, flourishing trees in retail centers provide models of best species choice and best practices that shoppers can transfer to their homes, and perhaps contribute to citywide tree canopy goals with new plantings? The potential behavior transfer of satisfying retail experiences to more generalized behaviors that contribute to urban sustainability sets up several intriguing research questions.

**CONCLUSION**

Consumer purchasing represents about two-thirds of the economic activity of the United States, and is a substantial economic influence in most nations. Merchants in urban business districts now face competitive pressure from regional malls, big box retailers and e-tailers. Marketing and consumer outreach serve multiple purposes, first attracting the attention and visitation of shoppers and, once people have arrived, helping to shape the character and quality of the shopping experience. While many conditions contribute to consumer perceptions of attractive, desirable shopping settings, the results of our research program suggests that a quality urban forest helps to define retail place. Many marketing studies have focused on the “micro” level of product packaging and placement, or indoor retail configuration. This study contributes information about the “macro” level of consumer perception, that is the positive influences of the outdoor environment on consumer choice and behavior.

Business people may fail to recognize the value of trees in the streetscape, or may judge costs (e.g., reduced patronage due to sign blockage, sidewalk debris) to be greater than potential economic gains. Yet non-economic factors (such as atmospherics) appear to influence consumer behavior and choice on a subconscious level. Business people, focusing on direct costs, can overlook potential place-marketing benefits of urban nature. Study results suggest that higher price valuations are mediated by psychological inferences of district character and product quality. Thus, creating and stewarding an urban forest canopy may enhance revenues for businesses in retail districts that offer diverse products and services. Consumer purchases pro-
provide both compensatory returns for district-wide costs of tree planting and maintenance, as well as revenue enhancement for individual businesses.

A comprehensive measurement approach was used in studies of retail business districts located in diverse city settings to better understand consumer perceptions and behavior in the presence of trees. Statistically significant differences were found on four groups of measures – visual quality, place perceptions, shopper patronage and product pricing – with forested districts having higher ratings and values. It is important to note that the highest ratings were granted to places having full, mature tree canopy, indicating careful maintenance across decades. City trees provide environmental benefits, the usual justification for urban forestry investment, and are an important concern as the public gains greater interest in urban sustainability. These studies demonstrate that trees serve other functions, particularly for retail and commercial interests. Trees and landscapes can be significant elements in place marketing. Economists have noted that shopping was once a utilitarian activity to fulfill needs and wants, but today’s shoppers are pursuing places that offer social, memorable experiences. Trees help create place and connect to deeply felt preferences and appreciations that people have for nature. The urban forest can be an important part of the vibrant, satisfying places that shoppers enjoy.

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REFERENCES


**ADDITIONAL READING**


**KEY TERMS AND DEFINITIONS**

**Biophilia:** A hypothesis about the innate and durable human attraction to nature due to an evolutionary history of reliance on landscape for basic needs, now expressed as fascination and aesthetic enjoyment when experiencing nature.

**Environmental Psychology:** A field of research and practical applications, based on contributions of multiple disciplines, concerning the interplay of humans and physical settings, and the mutual benefits that can result. Settings can include natural environments, built places, and any particular places (such as offices or hospitals) where human function is dependent on physical factors.

**Green Infrastructure:** Using natural systems and their ecological functions to replace, augment, or supplement more traditional gray infrastructure in urban settings, in order to achieve more cost-effective and sustainable management of air and water quality.

**Landscape Preference:** A field of study spanning nearly 40 years that demonstrates the general and consistent positive response of humans to certain landscape elements and their arrangements, with large trees and park-like settings being particularly favored.

**Metro Nature Services:** The array of human benefits provided by the experience of nearby nature in cities – including positive cognitive, emotional, and physiological outcomes – demonstrated by nearly 40 years of research and indicating that trees, parks, and gardens in cities serve broader purposes than aesthetics and beautification.

**Nature Atmospherics:** An understanding of how trees, gardens, and landscapes, as an ambient feature in retail settings, play a role in shopping environment appeal and consumer behavior.

**Urban Forestry:** The care and management of trees in urbanized environments (including streets, parks, open spaces, and within all public and private land uses) for aesthetic, environmental, economic, and public health functions and benefits.