

CULTURAL BACKGROUND AND LANDSCAPE HISTORY AS FACTORS AFFECTING PERCEPTIONS OF THE URBAN FOREST

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Abstract. Because a large proportion of the urban forest grows on private property, it is necessary to have broad community support for urban forestry. As people from all over the world live in Canadian cities, it was hypothesized that people with different cultural backgrounds would have different perceptions of the urban forest. This hypothesis was tested by (1) researching different landscaping traditions; (2) interviewing members of four different communities; and (3) conducting vegetation inventories. Inventory and interview data provided a consistent picture of the four communities. The British community reacted the most positively to shade trees. They also expressed the greatest willingness to plant shade trees, had the most shade trees per square meter on their properties, and were the only group that liked naturalized parks (hiking paths). The Chinese community showed less yard maintenance than the other communities, and many of the Chinese indicated that they did not want to add trees to their property. The Chinese responded more favorably than the other groups to photographs depicting landscapes free of trees. Italian and Portuguese communities emphasized fruit trees and vegetable gardens, and responded negatively toward shade trees when these were in conflict with their gardens. These cultural differences are largely consistent with the traditional use of trees in British, Mediterranean and Chinese landscaping, and appear to be maintained among North American immigrant populations.

Key Words. Urban forestry; cultural geography; cultural perceptions.

It is well established that trees in the city provide substantial benefits for urban residents. Trees reduce summer temperatures, both by casting shade and by acting as natural air conditioners through transpiring water (Nowak 1994). Trees also diminish atmospheric pollution, partly by sequestering carbon as they grow, and also by lowering summer temperatures, thus reducing the need to consume energy for air conditioning (Heisler 1986; Federer 1989; Akbari et al. 1992). In addition, trees provide valuable wildlife habitat and protect species diversity in the urban environment. However, because a large proportion of urban trees

grow on private property, support for urban forest management among individual landowners is important. If private home owners do not support urban forestry, attempts to promote the urban forest canopy may face resistance (Hull 1992; Sommer 1994).

In the early 1990s, when both Toronto and Vancouver, Canada, enacted bylaws to restrict the cutting of mature trees on private property, objections and compliance problems were encountered among certain cultural groups (Moloney 1995; Vincent 1995). A plausible hypothesis is that cultural factors resulted in widely different attitudes towards trees in the urban environment (Talbot and Kaplan 1984; Schroeder and Daniel 1981). Subsequently, our study focused on distinct cultural communities in Toronto. A brief historical review identified key features of the role of trees in the domestic landscape of each cultural group. Then an empirical study compared attitudes toward trees and other landscape features among present-day members of those cultures (Johnson and Monear 1994).

LANDSCAPE HISTORY

Of the four groups studied, three distinct landscape histories emerged: the British landscape tradition, which is dominated both economically and culturally by large forests, the Mediterranean, which emulates small-scale agriculture, and the Chinese, which has evolved a tradition of abstract ornamental gardens.

British

Throughout the Middle Ages, forests in England were managed primarily for three uses: timber for the navy, firewood for the common people, and game production for the gentry (Hunter 1985). The emphasis on game created an early and significant association between the elite of society and natural areas, as close advisors to the king were often lords of valuable land and were expected to ensure a plentiful supply of animals to hunt during royal visits. Because the aristocrat

spared no expense for the visual amenity of these natural spaces, their forested manor homes became a symbol of the wealth, power, and prestige of upper-class English society (Miles 1967).

The British Navy, with its voracious appetite for English oak, reinforced this system. The British Empire was built on the power of its sea routes, and this demanded both merchant ships and a large navy to keep the trade routes safe from piracy. Thus, for an aristocrat, planting an oak forest for the navy was not only a sound business investment but an act of allegiance to the British crown (Hunter 1985).

With the economic upheaval of the Industrial Revolution, traditional land rights and tenure security were eroded under a number of economic changes that discouraged long-term investments in forestry. The traditional forests of Britain also lost ground economically when iron cladding replaced oak for ship hulls. With the development of iron ships, the main purpose of the British forest industry vanished (Hyams 1977).

However, the emerging class of wealthy industrialists, eager to gain status in the eyes of the landed gentry, adopted many of the visible trappings of established wealth. This included embracing old-style country manors and wooded properties, often by buying the estates of bankrupt gentry and copying the aristocrats' lifestyle. Thus, the relationship between mature deciduous stands and the social elite was maintained (Miles 1967).

Concurrent with the Industrial Revolution was a reaction in Britain against industrial development that romanticized the world of nature (Bunce 1994). The English school of landscape architecture brought the country into the city in the form of greenspace planning in order to minimize the negative effects of industrial manufacturing such as pollution and visually unappealing factories (Aalen 1992). This urban planning movement, called the Garden City Movement, gained a strong following in Britain and in North America, where its mark can be seen in the design of the downtown core of Washington, D.C. and New York's Central Park.

Chinese

Chinese landscape history reflects the relationship between Confucianism and Taoism, two rival philosophies that underscore much of Chinese culture. Confucianism imposed a rigid social hierarchy which,

in turn, influenced urban planning. The geometric symmetry of Asian cities is a reflection of Confucian ideals, and it reinforces class boundaries and social groups (Keswick 1978). For example, Chinese cities were walled, not only to protect the inhabitants and the emperor, but also so that the emperor could keep watch over his vassals (Liu 1989). Furthermore, Chinese citizens had little or no direct role in shaping the city, and what little green space exists in Chinese cities is under the control of the government.

The layout of traditional Chinese homes also reflects Confucian values of hierarchy and social order. The typical Chinese home, which has changed very little in the past 3,000 years, generally consists of a number of buildings in which members of an extended family live. These all would face onto one or more courtyards separated by dining rooms and areas common to the whole family (Tsu 1988). This layout closed the family off from the rest of society and brought the outdoors into the family's private compound. For the Chinese, unlike the British who sought privacy by having nature around the home, the space outside the home is unimportant because the inner courtyard is where the family socializes.

The family courtyard was the traditional area where the rigidity of Confucianism gave way to the experiential philosophy of Taoism. In the courtyard, the Chinese family tried to create artistic abstractions of nature, rather than attempting to reproduce it. The designers of a Taoist courtyard tried to prevent the ends of design features from being visible, and they avoided straight lines. Furthermore, trees play a very small part in Chinese gardens. Water, stone, and buildings are the critical elements of the Chinese garden, and a highly influential style manual, *Yuan ye (The Craft of Gardens)* from the 1800s, only mentions plants in conjunction with water, rocks, and buildings (Titley and Wood 1991). In contrast, North American parks tend to be full of large trees and expansive lawns. To the Chinese immigrant, such a literal recreation of nature might seem empty and uninteresting (Keswick 1978).

Thus, three cultural issues highlight Chinese landscapes: 1) Chinese gardens are in courtyards and much more private than North American front and back yards, 2) Chinese gardens are abstract and do not stress vegetation, and 3) the social hierarchy in China prevented people from developing a tradition of involvement with urban design, even to the extent of not beautifying the outsides of their homes.

Italian and Portuguese

From the Middle Ages onward, the areas surrounding cities in the Mediterranean were composed of small-scale intensive agricultural plots (Bethemont and Pelletier 1979). In the years following World War II, waves of Mediterranean immigrants came to Canada and continued this agricultural tradition, with grapes, fruit trees, and vegetables in the back yards of Toronto (Olschki 1949).

The fragility of the Mediterranean soil also influenced these agricultural practices. Houston (1964) summarizes the western Mediterranean landscape and culture as a conflict between fruitfulness and frugality, where nothing but ingenuity allowed people to harvest rich crops from soil degraded by millennia of use. As a result, all areas that can be intensively used are under cultivation, and agricultural areas are broken only by infertile and eroded lands (Olschki 1949).

Being one of the earliest hubs of Western society, the Mediterranean has undergone a vast transformation over the centuries. Much of the original landscape and native vegetation have been lost for centuries and largely replaced by agricultural and introduced species. A naturalized landscape, which is the goal of some contemporary North American greenspace planning, may seem foreign to people coming from a land where the natural landscape vanished centuries ago.

The Renaissance villa also influenced the relationship between the Mediterranean culture and its surroundings. Although the villa was intended as an agricultural center that enabled a landlord to control his rural affairs, the buildings were a refuge where one could enjoy the view of the surrounding countryside and where passersby could see over the walls and admire the landlord's garden (Cosgrove 1993). Various Renaissance architects, therefore, have stressed that the villa was designed to incorporate sloping ground so that the surrounding landscape could be seen over the walls and from the buildings themselves (Thacker 1979).

EMPIRICAL STUDY

Population

Four culturally distinct populations in the metro Toronto area were identified on the basis of questions about language and country of origin in the 1991 Canadian census. Based on a literature review, it was anticipated that each of these groups had a distinctive

landscape tradition. To control for social and economic variables between households, each of the study populations had an average combined annual household income between Cdn\$45,000 and \$55,000, and lived in detached or semi-detached homes built before 1945. In community 1 (census tracts 079 and 338), 50% of residents self-identified as British. In community 2 (tracts 027, 028, and 029), 50% of residents self-reported as being of Chinese origin. In community 3, 67% of the residents were of Italian background (tracts 110, 111, and 112), and in community 4 (tracts 042, 043, and 044), 35% to 40% were of Portuguese background, as reported in 1991.

Interview

To identify a sample of households for study in each community, names that could be identified as Chinese, British, Italian, and Portuguese were selected from a list of all residents in each respective area, and a random selection of 50 of these names was generated for study. To control for intrapopulation social and economic variability, information was gathered from each respondent on age, length of time in Canada, and whether they owned or rented their homes.

A total of 210 interviews were conducted in the summer of 1996. Two to three days before interviewers went into a community, a letter of intent, translated into the language of the community, was delivered to all houses selected for study. Interview questions were translated by representatives from each community and by student research assistants fluent in the relevant language. The interviews were administered face to face by these same student assistants.

The interview itself had five sections:

1. Respondents were asked what changes they had made or would make to their gardens.
2. Respondents were asked what kind of tree they would plant on their property.
3. Next, respondents were shown a series of five computer-generated home landscapes depicting the same house with either a lawn, a vegetable garden and fruit tree, two shade trees, an ornamental shrub garden, or an interlocking brick patio. Half of the respondents saw a two-storey brick house, while the other half saw a one-storey stucco house. Respondents were asked to rank the five front yards from 1 (most preferred) to 5 (least preferred).

4. Respondents were then asked to react to photographs of four different park types (a photograph of a playing field, a flower garden, a playground, and a hiking path) and were asked to score each one on a scale from 1 to 5 whether the city would be improved by such a park type (5) or degraded (1) if there were more of each type of park in the city.
5. Finally, the interviewer asked some demographic information, including whether respondents owned or rented their homes, how many years they had been living in their homes, their age (in decades), and how many years or generations their families had lived in Canada.

Researchers made at least three attempts to contact each person selected for the study at different hours and on different days. If researchers were unable to make contact with the person after the third try, the respondent was removed from the list and another was randomly selected. In all, 15% of the people selected for study could not be reached, and 22% were either unwilling or unable to complete the interview, leaving 50 interviews in each community.

Inventory

While the interview was being conducted, a second researcher completed a vegetation inventory of the respondent's property. The size of the property was measured, and the percentage of driveway, patio, flower garden, vegetable garden, lawn, and area left untended were estimated for both front and back yards. Surveyors subjectively rated the standard of maintenance of the yard using a score of 0 (no sign of tending or care in the yard) to 2 (a great deal of care and maintenance).

Trees on the property were counted and classed in one of four categories: shade, fruit, ornamental, shrubs. For the purpose of this study, shade trees were considered to be more than 3 m (10 ft) high or of a species that would reach that height in its current location. Fruit trees were generally smaller and had an obvious horticultural purpose. Trees were classified as ornamental if they were small or mid-sized (2 to 3 m [6.6 to 10 ft]) and had been added for landscaping purposes rather than shade or fruit. Shrubs were defined as less than 2 m high and either were not species

that would reach full tree size, or were planted in containers that prevented them from growing to maturity. Thus, maples (*Acer* spp.) and spruce (*Picea* spp.) were considered shade trees; crabapples (*Malus* spp.) and saucer magnolia (*Magnolia* × *soulangiana*) were classed as ornamental; and peach (*Prunus* spp.) was classed as a fruit tree.

Statistical Analysis

Inventory data were analyzed by least squares analysis of variance using the general linear model (PROC GLM) of SAS Institute (1989) to detect significant differences among the four populations in yard size, yard composition, maintenance score, and the types of trees planted. Because an F-max test for heteroschedacity showed non-normality in the data, the Kruskal-Wallis test was used to confirm the 5% level of significance (Sokal and Rohlf 1981).

Interview data were analyzed in two ways. Questions regarding park photographs and choice of landscape were analyzed by least squares analysis of variance. Ratings of the park photographs were first standardized to scores of +1 (the city would be improved by that type of park), 0 (the city would be neither improved nor worsened by that type of park), or -1 (the quality of the city would be lessened by that type of park). For questions regarding changes that residents had made, and the types of trees they had planted or would plant, differences between communities were tested by a Chi-square test for independent samples. Demographic questions (how long people had been in Canada, whether they owned or rented their home, their age, gender, and the number of years they had lived in their house) were included in the analysis of variance to test the influence that these factors played. Only results that showed a significant cultural effect are reported.

Results

When respondents were asked if they had planted or would plant shade, ornamental, or fruit trees, it was the British who had planted (or would plant) the most shade trees. The Italian community, followed by the Portuguese, had planted (or would plant) the most fruit trees, while the Chinese community had planted (or would plant) the least number of trees. Similar results were obtained when respondents were asked, "If you were to plant one tree in your yard, would it be a large

shade tree, a small ornamental, or a fruit tree?" (Table 1). Of the 50 Chinese respondents, 22 answered this question by saying that they would not plant a tree in their yard even though this choice was not offered in the wording of the question. A Chi-square test for independent samples confirmed significant differences among the four cultural groups ($P < 0.05$).

The communities also differed in their ranking of the photographs showing the same house with different front yards. Analysis of variance of the ranking showed a strong interaction between the photograph and culture ($P < 0.001$). In general, the British were most favorably inclined towards the photographs with trees and shrubs, while the Chinese reacted more favorably than the other communities to the brick and lawn photos (Figure 1). In discussing the photographs with the respondents, many Italian and Portuguese stated that they did not like the treed photograph because it concealed the front of the house. Conversely, some British people preferred the treed lot because it had greater privacy than the more open landscapes.

Culture also was highly significant in determining preferences for types of parks ($P < 0.001$). Significant differences were found among cultural groups for three photographed areas (hiking trail, $P < 0.001$; playground, $P = 0.005$; flower garden, $P < 0.001$) but not for the playing field ($P = 0.068$). The British community was alone in reacting favorably to the hiking trail, while the other three communities were most receptive to flower gardens (Figure 2).

In back yards, the average amount of area that was untended (weeds or garbage, bare earth, etc.), and the size of vegetable gardens varied significantly between groups ($P = 0.001$ and $P = 0.025$, respectively). The

Table 1. Number of respondents (out of 50) from each of the four communities selecting shade, fruit, ornamental, or no tree when asked which type of tree they would like to plant on their property. Communities that do not have a superscript letter in common differ significantly ($P < 0.05$) by Chi-square test.

Type of tree	Community			
	British ^a	Chinese ^b	Italian ^c	Portuguese ^d
Shade	23	4	8	5
Fruit	9	13	29	18
Ornamental	4	11	7	19
No addition	1	22	2	8
No response	13	0	4	0

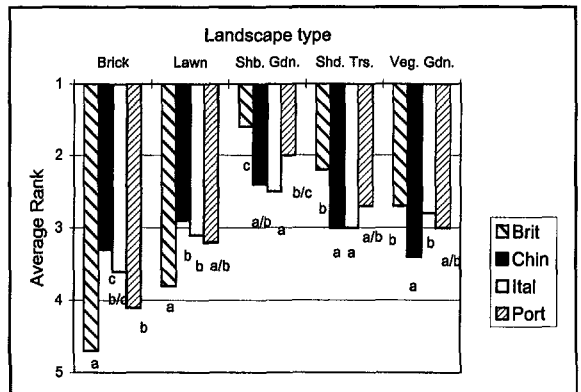


Figure 1. Average rank (1 = first choice, 5 = last choice) assigned by British, Chinese, Italian, and Portuguese respondents to residential photographs showing a home landscape with either brick, lawn, shrub garden, shade trees, or vegetable garden and fruit tree. Means that do not have a letter in common differ significantly ($P < 0.05$) by the Duncan pairwise comparison (SAS Institute 1989).

Mediterranean communities had the largest vegetable gardens, while the British had the smallest. The Chinese had an average of 6.6 m² (71 ft²) of untended land in their back yards, while none of the other communities exhibited this land use. The types of trees in respondents' back yards also varied significantly among cultural groups (shade, ornamental, and fruit trees, $P < 0.001$, other vegetation $P = 0.01$). The British community had the most shade and ornamental trees, while the other communities, especially the Italians, had predominantly fruit trees (Figure 3). For respondent's front yards, the inventory uncovered no statistically significant differences between communities in the proportion of vegetable gardens, lawns, flower gardens, and patios/driveways, or the types of trees.

Analysis of variance of maintenance levels showed a highly significant cultural effect ($P < 0.001$), with the Italians scoring highest (maintenance level 1.5 ± 0.06), followed by the British (1.2 ± 0.009) and Portuguese (1.3 ± 0.07). The Chinese community scored the lowest (0.6 ± 0.09).

DISCUSSION AND MANAGEMENT IMPLICATIONS

The benefits of the urban forest are benefits that the entire neighborhood enjoys. Air quality, microclimate amelioration, stormwater attenuation, property

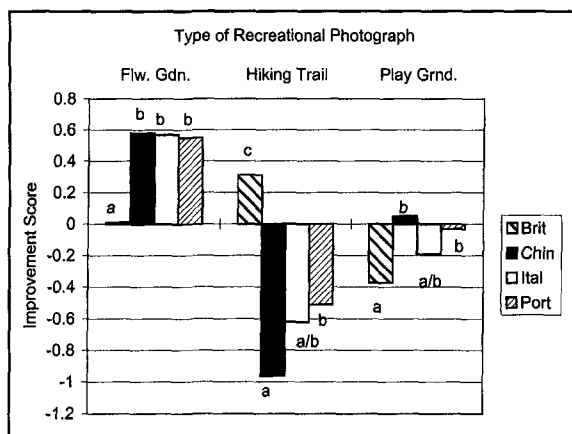


Figure 2. Average improvement score (-1 indicates the city would be worsened, +1 indicates the city would be improved) assigned by British, Chinese, Italian, and Portuguese respondents to photographs showing either a flower garden, hiking trail, or playground. Means with the same letter do not differ significantly ($P < 0.05$) by the Duncan pairwise comparison (SAS Institute 1989).

value, and aesthetics go far beyond the individual home owner and accrue to the community as a whole. However, the bulk of the trees in North American cities grow on private property. As a result, these trees are beyond municipal jurisdiction and, with the exception of tree cutting bylaws that prohibit the removal of trees on private property, it is impossible for the majority of the urban forest to be planned or managed using conventional means. As this study has highlighted, cultural differences create another layer of complexity in developing an urban forest strategy. In each of the cultures studied, we can see how the landscape traditions established over many centuries manifest themselves in today's urban environment. The British, with their heritage of wooded manors and large naturalized parks, were far more interested than the other groups were in mature shade trees. The relationship between this type of tree and this cultural group has been maintained through the generations, and is still evident in the actions of urban British-Canadians. Similarly, the Mediterranean community, having evolved in a small-scale agrarian culture, has transplanted their gardens into the backyards of urban Canada, bringing with their tomato and basil plants a desire for a community where neighbors, living in houses un-

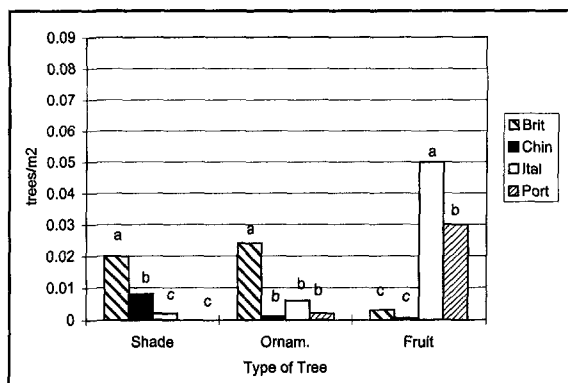


Figure 3. Number of trees per square meter planted in the back yards of British, Chinese, Italian, and Portuguese respondents. Means with the same letter do not differ significantly ($P < 0.05$) by the Duncan pairwise comparison (SAS Institute 1989).

concealed by trees, are a part of each other's lives. Far from being assimilated, therefore, cultural differences continue to manifest themselves in the subtle ways that people perceive and use nature in the city.

In light of different cultural perceptions of the urban forest, there are three broad strategies that a planner can adopt. First, the planner can choose to ignore cultural differences in favor of the practical or climatological benefits of the urban forest. In this case, planners should be prepared for resistance from certain communities and can hope for support from others. In areas that are culturally mixed, and not dominated by any one background, this may be the only feasible approach. A second strategy is to forfeit the ecological benefits of urban trees and not try to impose a canopy of mature shade trees on a community that will not support it. This strategy may be most appropriate in an area that is dominated by a group that is steadfastly opposed to shade trees and may sabotage (either intentionally or inadvertently) any attempts to establish them. In this case, an awareness of the community's perception may prevent valuable resources from being spent trying to enforce a management plan when the community will be hostile to its goals. The last strategy would be to conduct an education program to show residents the benefits of the urban forest and enlist community support. Although such a program requires more time and effort, and involves much

more than just planting trees, in some cases it may prove to be a fruitful way of establishing or supporting an urban forest plan.

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Résumé. Tout comme la population du monde entier qui vit dans les villes, on a posé l'hypothèse que les gens avec des bases culturelles différentes auraient des perceptions différentes de la forêt urbaine dans les villes canadiennes. Cette hypothèse a été examinée : 1) en recherchant différentes traditions en aménagement paysager, 2) en interrogeant les membres de quatre communautés différentes, 3) et en effectuant des inventaires de végétation. La communauté britannique était la plus positive en regard des arbres ornementaux, exprimant le plus grand désir à planter des arbres, possédant sur leur propriété le plus grand nombre d'arbres ornementaux au mètre carré et en étant le seul groupe qui appréciait les parcs naturels avec des entiers de randonnée. La communauté chinoise démontrait moins d'intérêt que les autres communautés pour l'entretien de leur propriété, et plusieurs ont mentionné qu'ils ne désiraient pas y ajouter d'arbres. Les communautés italienne et portugaise mettaient l'emphase sur les arbres fruitiers et les jardins potagers, et exprimaient des réponses négatives envers les arbres ornementaux lorsqu'ils étaient en conflit avec leur jardin. Ces différences culturelles sont largement similaires avec les usages traditionnels des arbres dans les aménagements paysagers de type britannique, méditerranéens et chinois et semblent s'être maintenues parmi les populations immigrantes en Amérique du Nord.

Zusammenfassung. Da in kanadischen Großstädten Menschen aus aller Welt leben, wurde die Hypothese aufgestellt, daß Menschen mit unterschiedlichem kulturellen Hintergrund auch unterschiedliche Erwartungen an eine Stadtforstwirtschaft haben. Diese Hypothese wurde getestet durch 1. Erforschen der unterschiedlichen traditionellen Landschaftsformen, 2. Interviews mit Mitgliedern aus vier verschiedenen Gemeinden und 3. Durchführung von Vegetationsinventuren. Die britische Gemeinde reagierte sehr positiv auf Schattenbäume, drückte die größte Bereitschaft aus, Schattenbäume zu pflanzen, hatten die meisten Bäume pro Quadratmeter auf

ihren Grundstücken und war die einzige Gruppe, die natürliche Parkanlagen (mit Wanderpfaden) mochte. Die chinesische Gemeinde zeigte wenig Interesse an der Unterhaltung von Parkanlagen und viele fügten hinzu, daß sie keine Bäume auf ihr Grundstück pflanzen würden. Die Chinesen reagierten vorzugsweise gegenüber anderen Gruppen auf Abbildungen ohne Bäume. Die italienischen und portugiesischen Gemeinden bevorzugten Obstbäume und Gemüsegärten und reagierten negativ auf Bäume, wenn diese in Konflikt mit ihrem Garten geraten würden. Diese kulturellen Unterschiede stimmen weitgehend mit der traditionellen Landnutzung in den britischen, mediterranen und chinesischen Landschaften überein und scheinen sich in der nordamerikanischen Immigrantengruppe zu erhalten.

Resumen. Debido a que gente de todo el mundo vive en ciudades canadienses, se hizo la hipótesis de que la gente con diferentes bagajes culturales podría tener percepciones diferentes del bosque urbano. Esta hipótesis fue probada: (1) investigando diferentes tradiciones acerca del paisaje; (2) entrevistando a miembros de cuatro diferentes comunidades; y (3) realizando inventarios de la vegetación. La comunidad británica reaccionó más positivamente hacia los árboles de sombra, expresando la mayor disposición a plantar árboles, tuvieron la mayor cantidad de árboles por metro cuadrado en sus propiedades, y fueron el único grupo que gustó de los parques naturales (senderos peatonales). La comunidad china respondió más favorablemente que otros grupos a fotografías sin árboles. Las comunidades italiana y portuguesa hicieron énfasis en los árboles frutales y jardines de hortalizas, y respondieron negativamente hacia los árboles de sombra cuando interfirieran con sus jardines. Estas diferencias culturales son fuertemente consistentes con el uso tradicional de los árboles en los paisajes de Gran Bretaña, China y el Mediterráneo, y parecen mantenerse entre las poblaciones inmigrantes de Norte América.