

Environmental awareness, interests and motives of Botanic Gardens visitors: Implications for interpretive practice

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Botanic gardens attract a wide range of domestic and international tourists, as well as regular visitors from their local areas. As both conservation and education are among the objectives of botanic gardens, they are potentially well-placed to offer community education about conservation, to engender pro-conservation attitudes, and to encourage the public to support conservation efforts. In order to inform the development of appropriate interpretive strategies targeting conservation issues, information is needed regarding visitors' existing conservation awareness, interests and motives for visiting. This paper addresses this need by describing the environmental awareness, interests and motivations of 150 visitors to the Mt Coot-tha Botanic Gardens. Gardens visitors were found to be less interested in and committed to conservation issues, and less motivated to learn, than visitors to other free-choice learning settings such as museums, zoos, aquariums, heritage sites, natural areas and wildlife tourism activities. The implications for interpretive practice in botanic gardens are discussed.

Public gardens, parks and botanic gardens attract a substantial number of domestic and international visitors throughout the world (Connell and Meyer, 2004), with Botanic Gardens Conservation International estimating that internationally, visits to botanic gardens and arboretums number approximately 250 million per year. Many gardens are considered famous tourist attractions in their own right, e.g., Monet's garden in France; Central Park in the USA; Kirstenbosch Gardens in South Africa; Butchart Gardens in Canada and Kew Gardens in Great Britain - the latter two each attract over 1.5 million tourists per year (ACIL Tasman, 2004; Royal Botanic Gardens, Kew, 2006). As 'flagship' attractions, such gardens may offer a sustainable form of tourism development, with positive impacts on the tourism economy in their local region (Sharpley, 2007).

Gardens vary widely in their design, purpose and features, and so it is not surprising that research has identified a wide variety of factors motivating garden visitation. These motives include appreciation of the aesthetic and rare qualities of plants; interest in garden design and landscaping techniques used in different periods of history; admiration of gardens' scenery and 'ambience'; and pleasure in being outdoors (Connell and Meyer, 2004). The peace and tranquillity of garden spaces and their spiritual and restorative benefits have also been identified as features that attract people to public gardens (Bennett and Swasey, 1996; Council Heads of Australian Botanic Gardens, 2005; Darwin-Edwards, 2000). Other reasons for visiting gardens include recreation, playing games and social interaction (Bennett and Swasey, 1996; Darwin-Edwards, 2000); the desire to gain inspiration (Bennett and Swasey, 1996); and the opportunity to relax and to read (Bennett and Swasey, 1996; Crilley and Price, 2005). The growing number of people participating in gardening as a leisure pursuit, the rising popularity of

lifestyle and gardening television programs, and increased coverage of environmental issues in modern media have also been linked to the increasing popularity of garden visiting (Connell, 2004; 2005).

Botanic gardens in particular are traditionally associated with environmental conservation and education, and they typically contain collections of plants for education, scientific purposes and display. Throughout the world botanic gardens are starting to take a greater responsibility for educating the public about global environmental change and conservation issues (Mintz and Rode, 1999; Willison, 1997). These gardens are usually informal and aesthetically pleasing, and are thus particularly well placed to showcase the interrelationships between plants, animals and humans and to explain how the different components are inextricably linked and interdependent (Jones, 2000). Botanic gardens have the potential to provide informal learning experiences that not only promote the importance of plants, habitats and conservation, but also influence the values, attitudes and actions of their visitors (Willison, 1997). To do this effectively, however, they require well designed interpretation that communicates the importance of preserving plants for the future well-being of the planet. Without such interpretation, gardens will face the possibility of becoming little more than attractive parks or urban spaces (Botanic Gardens Conservation International, n.d.). Indeed, the Council Heads of Australian Botanic Gardens (2005) claim that raising public awareness of the importance of biodiversity is critical in fostering conservation because it "...leads to an appreciation of the need to preserve natural habitats, to an understanding of the threats and consequences of loss of biodiversity, and to an appreciation of counteractive measures that can be taken" (p2).

Interpretive programs in botanic gardens include exhibits, displays, interpretive signage and guided tours with specific themes. Some botanic gardens also produce printed leaflets, guidebooks, maps and brochures that outline self-guided walks. Many gardens offer community programs and courses on topics such as propagation, weed control and plant adaptations (Foster, 1997), while others host annual displays and plant sales by local horticultural groups. Almost all botanic gardens display plant labels to inform visitors about the species on show.

Despite the emphasis botanic gardens place on educating the public to support their conservation efforts, there is very little research regarding the extent to which visitors are receptive to these messages. To be effective, interpretive materials must be specifically tailored to meet the knowledge, interests and needs of target audiences (Ballantyne and Packer, 2005; Ballantyne, Packer and Beckmann, 1998; Orams, 1994). The design and delivery of effective conservation learning experiences therefore requires managers and interpreters to develop a clear idea of visitors' pre-visit environmental awareness, interest and motivations, and to design messages that enable visitors to make connections between their previous experiences, their immediate surroundings and the issues being interpreted (Ballantyne, Crabtree, Ham, Hughes and Weiler, 2000).

To date, there have been few systematic studies examining botanic gardens visitors' environmental awareness, interests and motives. A survey by Connell (2004) found that approximately 70% of visitors to UK gardens described themselves as having a general interest in gardens. - only 10% had a special horticultural interest, and the remaining 20% were using the garden as a venue for a pleasant day out. Likewise, a recent survey

in the Adelaide Botanic Gardens by Crilley and Price (2005) found that although 57% of respondents cited ‘viewing plants’ as one of the three main reasons for visiting, only 15% were motivated by the desire to ‘learn about plants’. Indeed, it is generally accepted that the majority of visitors to botanic gardens do not come to learn per se (Darwin-Edwards, 2000).

If gardens are to foster community understanding of conservation, engender pro-conservation attitudes and encourage visitors to become personally involved in conservation activities, visitor research is needed to inform the design and delivery of garden experiences that continue to attract and inspire visitors. Accordingly, the research reported here aims to

- document and describe the environmental awareness, interests and motives of botanic gardens visitors;
- compare the interests and motives of botanic gardens visitors with those of visitors to other free-choice learning settings such as museums, zoos, aquariums, heritage sites, natural areas and wildlife tourism activities to ascertain whether visitors’ needs and expectations vary across sites that offer similar experiences; and
- draw implications from the above for the design and development of interpretive practice in botanic gardens.

METHOD

Research site

This research was conducted at Mt Coot-tha Botanic Gardens in Brisbane, Queensland. The gardens were established in 1970 and feature a series of distinctly different areas arranged in themes such as ‘Australian Plant Communities’ and ‘Fragrant Plant and Herbs’. A range of interpretive activities are offered, including educational programs for school students and guided walks for the public.

Procedure

Pre-visit questionnaires were used to explore visitors’ environmental awareness, interests and motives. A researcher stationed at the main entrance approached adult visitors during a six week data collection period. (Days sampled included weekdays, weekends and school holiday periods.) The aims of the research were briefly outlined and visitors were invited to complete a questionnaire before they entered the gardens.

Participants

A total of 150 visitors (61% female) completed the questionnaire. The majority of these (73%) were Brisbane residents, with 10% being from other parts of Queensland, 8% from interstate and 9% from overseas. Given the large proportion of local visitors, it is not surprising that 73% of participants were repeat visitors. Most of the Brisbane residents had been to the gardens before, with two-thirds having been four or more times (see Table 1). Approximately half of the 105 repeat visitors indicated that they had visited the gardens ten or more times.

Residence	First-time visitors (Never visited before)	Infrequent visitors (Visited 1-3 times before)	Frequent visitors (Visited 4 or more times)	Total
Local	15 (14%)	21 (20%)	68 (66%)	104
Non-local	24 (60%)	8 (20%)	8 (20%)	40
Total	39	29	76	144

Table 1: Respondents' previous visits to the botanic garden by place of residence

Most participants had come to the Mt Coot-tha Botanic Gardens as part of a family group (61% of the sample) or as a couple (21%). Family groups generally included one or two children (48% and 29% respectively). Only three of the 150 participants had visited on their own.

The most common age group participating in the research was 30-39 year olds (32%), followed by 40-49 year olds (25%). Visitors over 60 years old represented only a small proportion (13%) of the sample, dispelling the commonly held perception that botanic gardens attract mainly older adults. These patterns are similar to national trends (Australian Bureau of Statistics, 2005) which indicate that highest visitation is in the 25-35 year bracket followed by 35-44 year olds.

RESULTS AND DISCUSSION

Visitors' environmental awareness and interests

Visitors' conservation awareness, commitment and interest were measured by asking them to rate how closely a list of 13 conservation-related attitudes and practices described them on a seven point scale ranging from 1 (doesn't describe me at all) to 7 (describes me perfectly). Principal axis factor analysis with Varimax rotation was applied to these data (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .90). Three factors with eigenvalues > 1 were identified, which together accounted for 67% of the common variance. The items loading on each of these factors are reported in Table 2. (Two items with loadings < 0.5 were excluded: "I enjoy spending my time in nature" and "I enjoy gardening".) Subscale scores were calculated as the means of participants' responses on the items listed in Table 2 to represent Conservation Awareness (Cronbach's alpha = .83), Conservation Commitment (Cronbach's alpha = .80) and Interest in Gardening (Cronbach's alpha = .86).

Factor	Item
Conservation Awareness	<ul style="list-style-type: none"> • I use environmentally friendly products • I recycle at home • I am interested in learning about environmental issues • I often think about whether my actions harm the natural world
Conservation Commitment	<ul style="list-style-type: none"> • I donate money to environmental organisations • I do volunteer work for groups who help the environment • I actively search for information about environmental conservation
Interest in gardening	<ul style="list-style-type: none"> • I would like to learn more about water-wise gardening • I would like to learn more about organic gardening • I enjoy watching lifestyle/gardening TV programs • I would like to learn more about identifying noxious plants

Table 2: Items loading on the conservation awareness, commitment and interest factors

Respondents were classified as low (ratings of 1.0-2.0), moderate (ratings of 2.25-5.0) or high (ratings of 5.25-7.0) on each category. Responses were mostly in the moderate-high range for conservation awareness and interest in gardening, and in the low-moderate range for conservation commitment (see Table 3).

	Low	Moderate	High
Conservation Awareness	3%	55%	43%
Conservation Commitment	47%	49%	4%
Interest in Gardening	11%	61%	28%

Table 3: Visitors' conservation commitment and interests

These results are difficult to interpret without normative data from the general population. Comparable data were available from visitors to wildlife tourism attractions (including whale watching, turtle hatching, aquarium and marine park experiences) on three of the 11 items (see Table 4). Botanic gardens visitors were significantly lower than turtle hatching, aquarium and marine park visitors on two of these: 'I am interested in learning about environmental issues' ($F_{4, 1195} = 5.88, p < .001$), and 'I actively search for information about environmental conservation' ($F_{4, 1193} = 8.99, p < .001$). Therefore, it would appear that visitors to the botanic gardens are slightly lower in their conservation interest and commitment than visitors to wildlife tourism attractions.

	Botanic Gardens	Whale watching	Turtle hatching	Aquarium	Marine Park
I am interested in learning about environmental issues	4.41	4.85	5.01	4.86	5.10
I often think about whether my actions harm the natural world	4.74	4.66	4.93	4.83	5.13
I actively search for information about environmental conservation	2.77	3.39	3.61	3.46	3.70

Table 4: Conservation interests and commitment by site (measured on a 7-point scale)

Visitor Motivation

Respondents were asked to rate, on a 7-point scale, the importance of 34 items as reasons for coming to Mt Coot-tha Botanical Gardens. Of the 34 items, 25 have been shown in previous research in free-choice learning environments to represent five categories of personal goals: Learning and Discovery; Enjoyment; Restoration; Social Contact and Self-Fulfillment (Packer, 2004). (The present data confirmed Cronbach alphas of .90, .79, .89, .81, and .88 respectively for these five subscales.) An additional 9 items were included to address reasons specifically related to gardens, plants and nature. Factor analysis (Principal axis factor analysis with Varimax rotation; Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .85) revealed a further two factors underlying responses to these nine items: Learning about Plants/Gardens (4 items, Cronbach alpha = .87); and Enjoyment of Plants/Gardens (3 items, Cronbach alpha = .70), together accounting for 62% of the common variance. (Two items with factor loadings below 0.5 were excluded: “To support conservation and protection of nature” and “To spiritually connect with nature”.) Mean responses to the seven subscales are reported in Table 5, together with comparable data from seven other sites on the first five subscales (Packer, 2004).

	MU	AG	WC	AQ	HS	NP	MP	EC	BG
Enjoyment	4.28	4.33	4.80	4.41	4.60	4.23	4.82	4.37	4.42
Learning and Discovery	4.69	4.46	4.31	4.24	4.38	3.89	3.98	4.21	3.23
Restoration	3.08	3.29	3.94	3.86	3.85	4.10	3.87	3.74	3.94
Social Contact	1.99	2.04	3.03	2.73	3.44	3.12	2.79	2.37	2.47
Self-Fulfillment	2.56	2.73	2.42	2.46	2.33	3.27			2.04
Learning about Plants/Gardens									2.51
Enjoyment of Plants/Gardens									4.74

Note. MU = museum; AG = art gallery; WC = wildlife centre; AQ = aquarium; MP = Marine Park; HS = heritage site; NP = national park; EC = ecotourism experience; BG = botanic gardens

Blank cells were not measured

Items were rated on a 7-point scale from 0 = ‘not important’ to 6= ‘extremely important’.

Table 5: Personal Goal subscales by site

Compared with visitors to other informal learning sites, botanic gardens visitors rated restoration as relatively more important and learning and discovery as relatively less important. In this respect, botanic gardens visitors are similar to National Park visitors, with both groups placing greater importance on restoration than on learning and discovery ($t_{141} = 6.59, p < .001$). McLoughlin (1998) suggests that in natural areas it is the outdoor sensory experience itself that attracts visitors. Thus, many visitors may simply wish to absorb the atmosphere of their surroundings and have little interest in learning about plants and ecosystems (Crilley and Price, 2005; Darwin-Edwards, 2000). Michener and Schultz (2002) similarly suggest that many botanic gardens visitors consider the restorative qualities to be primary reasons for their visits.

Further analysis (MANOVA) revealed significant motivational differences according to frequency of visitation ($F_{14, 234} = 3.89, p < .001$). Post-hoc tests indicated that frequent visitors (those who had visited at least 4 times before) were more likely than first time or infrequent visitors to be motivated by Restoration ($F_{2, 123} = 6.16, p = .003$),

Enjoyment ($F_{2, 123} = 5.49, p = .005$) and Enjoyment of Plants/Gardens ($F_{2, 123} = 10.54, p < .001$). First time visitors were more likely than frequent or infrequent visitors to be motivated by Learning and Discovery ($F_{2, 123} = 3.00, p = .05$). These responses suggest that activities and features that appeal to regular visitors may not necessarily attract first-time visitors and that gardens should consider designing a suite of experiences to cater for different groups.

As found in previous research in other settings (Packer, 2004), non-local visitors were more motivated by Learning and Discovery than local visitors ($t_{139} = 2.04, p = .04$), however, confounding with visit frequency makes this effect difficult to interpret, and the number of participants in the non-local /frequent visitor cell were too low to support two-way analyses. Older visitors (over 40) were more likely to be motivated by Enjoyment of Plants/Gardens than younger visitors ($t_{136} = 2.68, p < .01$).

Considering responses to the individual items rather than the subscale scores, the most important reasons given for visiting the Botanic Gardens were: to enjoy oneself; to admire the garden's scenery; to spend quality time with family or friends; and to enjoy being outdoors/in nature. These motives are similar to those reported in previous garden research. For example, Connell and Meyer (2004) identified 'admiring the scenery' and 'enjoying being in the outdoors' as key motives for visiting gardens; while Bennett and Swasey's research (1996) highlighted the attraction of 'finding peace and tranquillity', 'relaxing mentally' and 'social interaction with friends and family'. The social facilitation role of gardens is particularly interesting, and may explain why only three of the 150 respondents in the Mt Coot-tha study came on their own. If, as it seems, social interaction is a key aspect of garden visits, then botanic gardens need to design activities and spaces that cater for and encourage group interaction.

Implications for the design and development of interpretation in botanic gardens

The major findings from this research were:

- Botanic gardens visitors reported having a relatively low level of interest in and commitment to conservation issues.
- The most important reasons given for visiting the Botanic Gardens were to enjoy oneself; to admire the garden's scenery; to spend quality time with family or friends; and to enjoy being outdoors/in nature.
- Botanic gardens visitors were similar to National Park visitors in that they rated Restoration as more important and Learning and Discovery as less important as motivations for visiting. Frequent visitors in particular were more likely to be motivated by restorative factors.

The above findings suggest that if botanic gardens are to introduce more educational activities that focus on conservation, they need to give careful consideration to how these are designed and promoted. As visitors are rarely highly motivated to learn, activities with a strong educational emphasis are unlikely to appeal. Preparing them for a learning experience at the entrance (e.g., by using provocative signage or leaflets to prompt their interest in environmental issues, or giving suggestions on how to get the most out of their visit) may increase both their receptivity to conservation messages and the quality of their subsequent conservation learning. Conservation messages need to be stated clearly, the links between human activity and environmental well-being carefully articulated, and specific suggestions for simple and achievable conservation

actions provided (e.g., visitors could be urged to join local conservation groups or to promote bird life in their area by planting native species in their own gardens).

Given the importance of restoration as a motivation to visit the gardens, interpretive activities should be designed to be consistent with the need for a peaceful, relaxing and reflective experience. For example, the importance of environmental conservation could be highlighted by encouraging visitors to reflect upon the aesthetic beauty of the gardens. As frequent visitors are particularly interested in the restorative benefits of the gardens, repeat visitation could be encouraged by designing and promoting interpretive activities that highlight these aspects of garden visitation, while encouraging a more reflective response to conservation issues. Possible examples include activities such as music concerts, art and craft lessons, poetry readings, butterfly spotting and bird watching (for specific examples, see Brooklyn Botanic Garden, 2007; Eden Project, 2007; Royal Botanic Gardens Melbourne, 2007). First-time visitors, however, may appreciate interpretive activities that focus more on learning and discovery activities, e.g., plant discovery trails, quizzes, information sheets, themed maps, guided walks and informal presentations.

Informal sessions and experiences that make connections with visitors' gardening experiences and interests are also likely to be popular, especially with older visitors. These activities could easily incorporate conservation messages such as demonstrations on designing and planting themed gardens (water wise gardens, bird-attracting gardens) or propagating techniques.

The fact that many younger visitors are accompanied by children suggests that objects, topics and activities that promote and encourage family sharing and conversations are likely to be attractive. For example, the Ian Potter Foundation children's garden at the Royal Botanic Gardens Melbourne provides a Discovery Shelter (an undercover investigation space) where children can use nets, aquaspheres, microscopes and a library to take their learning further (Royal Botanic Gardens Melbourne, 2007, Children's Garden section). The provision of hands-on learning experiences specifically catering for younger clientele could have a substantial impact on both children's and care-givers' enjoyment and conservation learning. Other examples that have been used in Botanic Gardens include treasure hunts with environmental or conservation themes, plays, 'critter spotting', concerts and picnics. As visitors rarely come on their own, conservation messages and activities that encourage and enhance social interaction may be effective for all age groups. By providing a range of such activities, gardens can position themselves as offering "more than simply a garden or horticultural experience" (Sharpley, 2007, p137) and so extend their popularity and appeal to the family market.

This exploratory study provides some insights into the motives and interests of botanic gardens visitors, although limited to a relatively small sample of visitors at one site. Further research is required to extend this study to other botanic gardens; measure the impact of botanic gardens experiences on visitors' conservation knowledge, attitudes and behaviour; understand how and what visitors learn on visits and how this learning affects their adoption of environmentally sustainable actions in their homes and communities; and explore ways in which interpretive activities can be used to raise visitors' awareness of environmental issues without compromising their need for restorative experiences.

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