



Resident attitudes towards trees influence the planting and removal of different types of trees in eastern Australian cities

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HIGHLIGHTS

- ▶ Australian urban residents divide into seven distinct groups based on attitudes towards trees.
- ▶ These groups have different propensities to plant and remove particular types of trees.
- ▶ Combined with house turnover, this propensity makes it unlikely for private trees to reach a great age.
- ▶ Groups vary in income, education and gender, but not in age, housing tenure or negative experiences of trees.
- ▶ Attitudes may not be readily amenable to change, and planners and managers need to address specific attitude groups.

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ABSTRACT

Little is known of the motives of residents for planting and removing garden trees in Western cities and nothing is known of the motives related to planting and removing different types of trees. We test the hypotheses that attitudes towards trees are reflected in the planting and removal of trees in general and of different types of urban trees, and that attitude syndromes are related to socioeconomic, demographic and spatial characteristics. A questionnaire asked for information on motives for planting and removing trees in general, and on actual planting and removal of trees in the last five years. Responses to questions about motives, to other questions on the values and problems of trees, and to a photo-elicitation section were numerically classified to derive seven classes of residents: aesthetes; spiritual tree lovers; practical tree lovers; arboriphobes; native wildlife lovers; tree hazard minimisers; and indifferents. Membership of classes was influenced by income, tertiary education and gender, but not age, negative experiences of trees or ownership status, indicating that attitudes may be relatively durable and not easily amenable to change. Attitudes tended to be expressed in actions. Variation between attitude groups in the types of trees they prefer combined with turnover of property ownership may be responsible for a lack of old urban trees. Urban planners and land managers interested in influencing resident decisions about private trees need to address variation in attitudes between different segments of the population.

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1. Introduction

There is an ample literature demonstrating that trees in urban areas make significant economic, environmental, social, cultural and spiritual contributions to the well-being of people and other sentient beings (see reviews in Dwyer, Schroeder, & Gobster, 1991; Elmendorf, 2008; Greene, Millward, & Ceh, 2011). Different types of trees contribute to these positive outcomes in different ways and to different degrees in different contexts. For example, urban bird

species vary in their preferences for different plant species (Daniels & Kirkpatrick, 2006a), individual people perceive different types of trees to be beautiful (Williams, 2002), and large-leaved deciduous trees are superior to small-leaved deciduous trees and evergreens in the thermo-regulation of buildings in temperate climates (Soares et al., 2011; Yoshiki & Mitashiro, 2007).

Despite the many positive benefits associated with trees, urban tree abundance is typically uneven within Western cities. Tree abundance is correlated with socio-demographic variables (Kirkpatrick, Daniels, & Davison, 2011; Landry & Chakraborty, 2009). High levels of education (e.g. Luck, Smallbone, & O'Brien, 2009), high incomes (e.g. Kirkpatrick, Daniels, & Zagorski, 2007) and Anglo ethnicity (e.g. Fraser & Kenney, 2000) have been shown to be predictors of tree abundance in western cities, although other variables can be important in particular contexts. For example, in a Canadian city, a multiple regression model containing, in order

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of explanatory value, dwellings built pre-1946, single detached dwellings, post-secondary qualifications, children under 5 years old and owner-occupied dwellings best explained propensity to participate in a tree planting program directed towards private lots (Greene et al., 2011).

People are known to vary considerably in their appreciation of urban forests and green spaces, with attitudes ranging from worship to fear (Chiesura, 2004; Skår, 2010). Public controversy over the logging of nonurban forests is widespread (e.g. Ruth, 1997). Yet relatively little research has focussed solely on public attitudes to street and garden trees (but see Head & Muir, 2005; Zagorski, Kirkpatrick, & Stratford, 2004), which are more proximal to the homes of people and more vulnerable to capricious human management. There is a strong tendency amongst residents of Western cities to respond positively to statements praising trees, and negatively to those suggesting that trees can create problems (e.g. Daniels & Kirkpatrick, 2011; Hull, 1992; Lohr, Pearson-Mims, Tarnai, & Dillman, 2004; Zhang, Hussain, Deng, & Letson, 2007). The extent of involvement in voluntary urban reforestation programs has also been taken as evidence of general public affirmation of the values of garden and street trees (Austin, 2002; Westphal, 2003). Braverman (2008), however, provides reasons for caution in accepting that 'everyone loves trees' in Western cities. Documenting the link between advocacy of urban tree benefits and the policies, and actions, of urban governments over the past 20 years in North America, she argues that negative community attitudes towards trees have been stigmatised, suppressed and masked in various ways by urban tree professionals and researchers.

While there is a modest body of research on resident attitudes to garden and street trees, there is very little addressing the link between attitudes and behaviours. Although there has been some useful theorisation (e.g. Dwyer et al., 1991; Gross & Lane, 2007), there are few data on motivations for private planting or removal of trees in general and no data on motivations for planting or removing particular types of trees. Summit and McPherson (1998) found that the planting of trees in private lots in Sacramento, California was motivated more by a desire for shade and beauty than for energy conservation, environmental reasons or privacy, and that trees were removed largely because they were dying, although avoiding damage to infrastructure, messiness or insect plagues were other motivations. Most activity took place in the first five years of home occupation, with planting outweighing removal. In a sample of Australian back yards and their owners, Head and Muir (2005) found that the major stated motivation for removal of trees was their perceived or actual danger, often related to their size, while the major reasons stated for planting trees were to improve aesthetics and attract birds.

The presence of trees and the frequency of types of trees vary strongly between garden types defined by their floristic composition (Daniels & Kirkpatrick, 2006b). Such garden types partly reflect the preferences and attitudes of the gardener (Zagorski et al., 2004). It could therefore be expected that the propensity to plant or remove trees, and trees of different types, would be related to the attitudes of residents. Groups of individual residents may share groups of attitudes (Zagorski et al., 2004). We call these groups of attitudes 'syndromes', in analogy with the collection of symptoms that constitute a disease diagnosis.

Attitudes do not necessarily translate into practices consistent with them (Larson, Cook, Strawhacker, & Hall, 2010; McCleery, Ditton, Sell, & Lopez, 2006; Zagorski et al., 2004), and practices thought to be consistent with attitudes do not always achieve outcomes consistent with attitudes (Daniels & Kirkpatrick, 2011).

In the present paper we test the hypotheses that attitudes towards trees are reflected in the planting and removal of trees in general and of different types of urban trees, and that attitude syndromes are related to socioeconomic, demographic and spatial

characteristics. We use six eastern Australian cities as our study area. We expect that our findings will be useful in developing nuanced approaches to planning and management of the private urban tree estate, not only in eastern Australia, but also in other parts of the world.

2. Methods

2.1. Data collection

We were interested in attitudes and actions in relation to the trees over which householders have some direct control. In many places in Australia residents have a strong influence on the presence and species of trees on the public land between their property boundary and the roadway, so our questionnaire included consideration of such street trees. We defined gardens as the non-built-up parts of domestic allotments.

The questionnaire was used to obtain data on individual attitudes to trees, negative experiences with trees, behaviour in relation to trees, demographic characteristics of respondents and attributes of places of residence. The questionnaire and its modes of distribution were approved by the Tasmania Social Science Human Research Ethics Committee. We ensured content validity by canvassing a wide range of people on their opinions on reasons for the planting and removal of trees before developing the questionnaire, as well as by consulting the limited literature on the subject. We helped ensure structural validity by trialling a draft questionnaire in a pilot survey with 44 respondents drawn from our local networks, including other social scientists familiar with questionnaire design.

We investigated the attitudes of respondents to urban trees through photographic elicitation, by asking them to select as many options as they wished from lists of reasons for planting and for removing trees (Table 1) and by asking them to indicate on a ten point Likert scale whether they agreed or disagreed with eight negative and eight positive statements about trees. The photographic images varied in tree prominence and contrasted native and exotic trees and the regularity of tree arrangement (Fig. 1). Survey respondents were asked to indicate their response along a 5-point Likert scale from strongly disagree to strongly agree to three statements: (i) there are too many trees in this street; (ii) I would prefer other types of trees in this street; (iii) I like the way in which these street trees have been arranged. The 10-point Likert scale statements began with either 'I value urban trees because' or 'I regard urban trees as a problem because'. Strong disagreement with a statement was indicated by 1 and strong agreement by 10. These questions were intended to elicit value-laden and emotive considerations that might not be expressed in hypothetical decisions to plant or remove trees or in responses to images.

We gained information on the experience and behaviour of our respondents with urban trees by setting them a self-assessed tree-identification test (using both common and scientific tree names) involving photographs of six species of trees common in all eastern Australian cities, by asking them if they had ever suffered injury or property damage involving a tree and by asking them whether they had planted or had removed trees in the last five years in the following classes: none, 1–5, 6–10 or greater than 10 trees. We also asked them to list the types of trees that they had planted and/or removed and later grouped these trees into broad enough taxonomic groups to enable analysis. We made a similar request and did similar grouping with details about personal injuries and property damage.

Finally we asked our respondents to indicate their age (8 classes), their sex, their country of birth, their parents' countries of

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