



Research paper

## White picket fences & other features of the suburban physical environment: Correlates of neighbourhood attachment in 3 Australian low-density suburbs

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## ABSTRACT

This study examines the relationship between neighbourhood attachment and five groups of physical characteristics of low-density suburbs: (1) street layout, (2) pedestrian environment, (3) neighbourhood connectivity, (4) public space provision, and (5) dwelling form. Although much research has investigated whether neighbourhood attachment is influenced by the urban design characteristics of high density contexts, there is little evidence of the impact of such characteristics in suburban environments with lower population densities, such as the types of low-density suburbs that ring Australian cities. Surveys were conducted in Victoria, Australia, to examine how these five groups of characteristics might impact residents' neighbourhood attachment in three suburbs with equivalent socioeconomic profiles. Questionnaires were delivered to eight streets of different layout in each suburb, and via on-street face-to-face surveys in public spaces adjacent to neighbourhood libraries. The results of five separate regression models indicated that all five groups of physical neighbourhood characteristics significantly predicted neighbourhood attachment. Home ownership, length of residence and age were also found to have strong correlation with neighbourhood attachment. When length of residency is controlled for, it was found that five physical variables were the best predictors of neighbourhood attachment: provision of open spaces, street type, trees coverage, sidewalk provision and number of community spaces. Only the provision of open spaces had greater impact on attachment than length of residency. Hence, the study findings suggest that both social and physical factors should be considered in the planning of suburban neighbourhoods.

## 1. Introduction

This paper investigates the relationship between neighbourhood attachment and the presence of a number of physical characteristics of suburban neighbourhoods in Australia. Neighbourhood attachment is one domain of sense of community (Kim & Kaplan, 2004), is one dimension of social cohesion (Dempsey, 2009; Wilkinson, 2007), is a significant determinant of neighbourhood satisfaction (Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999; Fried, 1982), and has even been suggested to be second only to satisfaction with family in determining a person's satisfaction with life itself (Fried, 1982).

The study described in this paper asks, what physical design characteristics of neighbourhoods predict neighbourhood attachment in low-density Australian suburbs, and which are the best contributors when socioeconomic factors are controlled for? These research questions are in line with the argument that liveable neighbourhoods are beneficial for social life (Raman, 2010), and, as Dempsey reports (2009), that the provision of some physical characteristics contributes to socially cohesive communities. Neighbourhood attachment in this

paper is measured using the Neighbourhood Attachment scale developed by Bonaiuto et al. (1999) and further validated by (Comstock et al., 2010). Both the role of neighbourhood form and dwelling form in impacting neighbourhood attachment are considered.

The findings suggest that neighbourhood attachment in low-density suburbs is affected by eight physical variables: (1) street layout, (2) tree-coverage, (3) number of community spaces with walking 5 min and open spaces (4) dwelling type, (5) fence height, (6) connectivity by walking, (7) the provision of sidewalks, and (8) access to on-street parking. Moreover, neighbourhood attachment is shown to be positively correlated with term of habitat, home ownership, and age. The implications of this research can inform strategies for architects, urban designers and planners concerning the provision of physical neighbourhood design characteristics that can improve neighbourhood attachment and social environment in suburban contexts.

## 2. Background

As two identified dimensions of attachment to place are social

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bonding and physical rootedness (Riger & Lavrakas, 1981; Taylor, Gottfredson, & Brower, 1985), neighbourhood attachment is associated with social and physical connectedness between individuals and their residential environment (Arnberger & Eder, 2012; Bonaiuto et al., 2003). Physically, neighbourhood is most commonly understood to refer to a residential area, while socially it is the place of social interactions (Jenks & Dempsey, 2007). While research identifies both socio-economic and physical characteristics of neighbourhoods as contributing to attachment, this is not always confirmed in findings.

Neighbourhood attachment, as an aspect of place attachment usually pertaining to urban environments, is quantitatively measurable. Through such measurement neighbourhood attachment has been seen to contribute to social interaction in urban neighbourhoods (Bonaiuto et al., 2003), and at same time neighbourhood ties have been found to be the best contributor to neighbourhood attachment (Lewicka, 2010). It has also been suggested that residents who choose to live in place because of appealing physical features are more likely to be involved in the local community and develop social ties; activities which in turn correlated with shaping the emotional and functional attachments to that place (Anton & Lawrence, 2014). Moreover, studies have also found that positive perception of the quality of residential environments is significantly correlated with high levels of neighbourhood attachment in urban contexts (Bonaiuto et al., 1999), and also with long-term residency (Bonaiuto et al., 1999; Comstock et al., 2010; Raymond, Brown, & Weber, 2010). For example, owners who are long-term residents tend to have a greater attachment to a neighbourhood, are more socially active and thereby have a greater sense of community (Brower, 2013).

Although attachment is often shaped by levels of emotional and physical bonds within neighbourhood environments (Fried, 1982), not all these ties are positive. For example, negative relationships can weaken social bonds with neighbours, which in turn can reduce neighbourhood attachment (Riger & Lavrakas, 1981). While, generally, urban design in low-density suburbs (meaning the design of dwellings and the spaces between them), has not commonly lead to the strengthening of social ties, neighbourhoods that have been designed with ecological sustainability in mind have been found to engage residents with outdoor activities and hence improve social interaction. For example, in USA context, suburbs designed to be pedestrian-friendly with abundant green spaces have compared to typical suburban neighbourhoods, been found to enhance neighbourhood attachment and create opportunities for social contact, which in turn leads to greater sense of community (Lund, 2002; Rogers & Sukolratanamete, 2009). Typical low-density suburban neighbourhoods in Australia are of curvilinear or cul-de-sac street types with long blocks, with single use typology, are car dependent and have limited access to open green spaces. Thus, these suburbs tend to be less transit-friendly than more established higher suburbs that are generally of traditional grid street type with connected networks, are pedestrian oriented and have good access to large open space (Davison, 2006; de Jong et al., 2013). While association is acknowledged between neighbourhood attachment and the physical design of neighbourhoods (Mesch & Manor, 1998; Wilkinson, 2007), for instance in relation to street layout, the provision of greenery and pedestrian environment (Arnberger & Eder, 2012; Kim & Kaplan, 2004), research has rarely evidenced the relationship (Bonaiuto et al., 1999; Kim & Kaplan, 2004). Moreover, while neighbourhood attachment has been studied frequently in the context of inner-urban, high-density housing (Bramley & Power, 2009; Comstock et al., 2010; Dempsey, 2009), few empirical studies have measured the impact of urban design characteristics on neighbourhood attachment in low-density suburbs (Lindsay, Williams, & Dair, 2010; Lovejoy, Handy, & Mokhtarian, 2010), or the impact of neighbourhood differences on attachment in the types of low-density suburbs that ring Australian cities (Bramley & Power, 2009; Dempsey, 2009; Kim & Kaplan, 2004; Rogers & Sukolratanamete, 2009). Only recently

has it been shown that provision of public and private green spaces, local facilities within walking distance, and increased provision of detached and semi-detached housing with gardens, are in low density suburbs correlated with well-being (Brookfield, 2016). The relationship between physical form and neighbourhood attachment is important to study in Australia because Australian low-density suburbs are home to approximately 70% of the population (Davison, 2006); a figure that continues to rise steeply as the cost of inner-city housing spirals (Roberts, 2007). In the year to 2015, six of the ten SA2s (Statistical Areas Level 2) with the largest population growth in Australia were outer suburbs of Greater Melbourne (STATISTICS, 2015).

The influence of socio-economic demographics on neighbourhood attachment has been well researched. For instance, evidence has been found for the impact on attachment of home-ownership, level of education (Anton & Lawrence, 2014; Buckner, 1988), income (which can determine residents' selection of neighbourhood and their length of residency (Bonaiuto et al., 1999)), and term of residency and ownership (Anton & Lawrence, 2014; Bonaiuto et al., 1999; Brown, Perkins, & Brown, 2003; Buckner, 1988; Comstock et al., 2010; Skjaeveland, Gärling, & Maeland, 1996). Evidence for the influence of resident age has been contradictory, with some studies finding a relationship (Buckner, 1988; Riger & Lavrakas, 1981) and others finding that this variable has no impact (Bonaiuto et al., 1999; Raymond et al., 2010).

The research presented in this paper examines the relative impacts on neighbourhood attachment of the chief socio-demographic variables identifies as important in the literature, and of five groups of urban design characteristics: (1) street layout, (2) pedestrian environment, (3) neighbourhood connectivity, (4) public space provision, and (5) dwelling form. These characteristics have been selected because of the importance attached to them in the literature, and because they can vary widely between Australian suburbs. The study uses the previously established neighbourhood attachment scale (NA) (Bonaiuto et al., 1999); a 6-item questionnaire based on the theoretical perspective of a previous study (Bonnes, Bonaiuto, Aiello, Perugini, & Ercolani, 1997). The NA measures attachment by surveying feelings of affective bonds toward neighbourhood, and has been shown to be extracted on one factor (named neighbourhood attachment) with Cronbach's alpha (0.86) (Bonaiuto et al., 1999). The later study of Comstock et al. (2010) also found correlation between the scale items indicating they are measuring the same factor i.e., neighbourhood attachment, with Cronbach's alpha of 0.86 again. While other researchers have developed an alternative version of the scale to measure neighbourhood attachment (Bonaiuto et al., 2003), which includes eight items – four positive items from Bonaiuto et al., and four negative items added to evaluate the possibility of multi-dimensionality – the uni-dimensionality of the scale was confirmed. Other studies have included items related to neighbourhood attachment within scales measuring sense of community and neighbouring (Buckner, 1988; Rogers & Sukolratanamete, 2009; Skjaeveland et al., 1996). This study utilises the original NA scale (Bonaiuto et al., 1999) to directly measure neighbourhood attachment, but in light of the repeatedly confirmed uni-dimensionality of the scale has excluded the last item for this merely opposes the meaning of a previous item in the scale.

### 3. Methodology

Three types of data were collected: (1) measurement of the independent variables i.e., physical urban design features such as tree coverage and fence height; (2) collection of the sociodemographic data of residents; and (3) measurement of the dependent variable neighbourhood attachment using the NA scale. Objective data of the physical environment was collected using on-street photography and high-resolution satellite Photomaps. Subjective data on demographics and neighbourhood attachment was collected using structured surveys.

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