




# A mixed methods approach to understanding streetscape preferences in a multicultural setting

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## Abstract

Relationships between people and their environments are continually reconstituted through public space. Culture and background are important influences on how people respond to their environments and, as populations become more diverse, it might be expected that public spaces respond to more diverse preferences. In New Zealand, despite its bicultural history, it is largely European preferences that have shaped public spaces. However, with immigration and travel, the country is rapidly becoming multicultural, with Pasifika people and Asians making up larger proportions of the population alongside those who identify as Māori and European. If public spaces are to respond to these changing demographics, there is little empiric evidence to inform urban designers and public space managers. This article discusses the methods used to examine streets as one of the most relevant types of public space in New Zealand. The methodology was deployed in two distinct stages, the first of which made use of ethnographic fieldwork and provided data on specific public spaces and their usage through a range of case studies. The second stage utilised online surveys to probe people's preferences for a series of visualisations of street environments. Most research on public space design has to date been focussed on one or the other of these methods (field research or visual preference surveys). The combination of methods used in this research enables a deeper understanding of which public space attributes foster lingering and social activities among people from different cultural backgrounds. This methodology is feasible and comprehensive, clearly identifying the important relationships between design, use and preference in multicultural societies. The findings will be of interest to other researchers, urban practitioners and city officials.

## Keywords

Mixed methods research, multiculturalism, street design, environment and behaviour research, visual preference surveys

## Introduction

Responding to new opportunities and citizen expectations, cities around the globe work continuously to improve the quality of their public spaces. Feeding into the change process is a growing interest in how public places can respond to the needs of people coming from different socio-cultural backgrounds. Due largely to the phenomenon of migration, urban populations comprise a growing range of different social and cultural backgrounds and the city's public spaces are where these people most frequently encounter and interact with those from different backgrounds (Hou, 2013; Mehta, 2013; Velden & Reeves, 2010). The best public spaces cater to the needs of all people who use them. In multicultural societies, this also means that public spaces should satisfy the expectations of the range of cultures represented

in the population, providing opportunities for everyone to relax, recreate and socialise. The extent to which public spaces accommodate the different and often conflicting needs of people is considered to be a reflection of their publicness (De Magalhães and Carmona, 2009).

The ways that cultural background might influence a person's response to a setting should not be assumed by public space designers (Rapoport, 2005). While Rapoport advocates for decisions to be based on empiric evidence, there is

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a scarcity of such information. Earlier studies in the environmental behaviour field have largely made use of either ethnographic fieldwork or questionnaires to elicit people's preferences for and uses of public space; however, each of these methods has its own inherent limitations. In this vein, new methodologies that can help guide design of public spaces can be quite valuable (Forsyth, 2007; Goličnik and Ward Thompson, 2010).

The research addresses that gap by looking at the influences that layout and design can have on people's activities along urban streets. To support the aims of the project, a novel methodology was designed to engage with people's social behaviours and to examine their preferences for alternative designs. The article discusses the use and utility of mixing methods before illustrating it within the specific research project that examines cultural diversity on urban streets in New Zealand (Lesan, 2015). The combination of methods we describe is distinguished from the methodologies used in many earlier studies of public space use, which have tended to employ a single method (either ethnographic fieldwork or visual simulations).

The first stage engaged ethnographic fieldwork as a basic method, with the researchers mapping people's activities in space and time through field observations and by interviewing them. This stage generated data about how three public street spaces are currently used. The second stage deployed online survey techniques to gather information about people's preferences for designs that might encourage them to linger and socialise along public streets. The complementary and sequential approach helped to illuminate characteristics that can make a street more attractive to people in New Zealand. While the project led to guidelines for designing and managing streets in multicultural settings (Lesan and Gjerde, 2020), these are discussed only briefly here as the article is focussed on the methodology.

## Mixed methods research

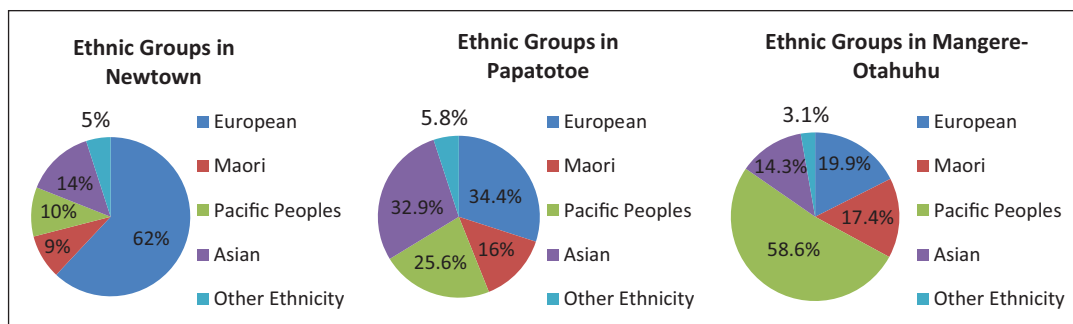
Reflecting the complex interaction of multiple variables affecting public space, urban studies have a long-standing tradition of mixed methods research. More widely, the social sciences are increasingly incorporating qualitative and quantitative methods into research (Creswell and Plano Clark, 2011). A mixed methods approach could improve confidence in the robustness of research by addressing 'research questions that don't sit comfortably in within a wholly quantitative or qualitative approach to design and methodology' (Armitage, 2007: 3). The combination of qualitative and quantitative methods can enable more comprehensive interpretation of data, making use of the most appropriate tools available (Bryman, 2006, 2012; Creswell, 2013; Tashakkori and Teddlie, 2010). Mixed methods research also serves and provides an opportunity to *triangulate*, or explain the findings of one method through another, thereby improving the accuracy of findings (Bryman, 2012).

Despite these advantages, some scholars have identified several challenges to conducting mixed methods research. For example, the purity and focus of each method could be lost in the combination or that conducting mixed methods research can be both expensive and time-consuming. Small (2011) warns that mixing methods can lead to mixing of data, irrespective of whether they are qualitative or quantitative in nature. This includes mixing different types of data, methods of collection or analysis. Researchers would need to learn both methods and understand how to combine them effectively. How researchers interpret conflicting results of qualitative and quantitative methods can be ambiguous. Finally, the reporting phase can be elongated and challenging (Carmona, 2014; Johnson and Onwuegbuzie, 2004).

Data collection can be either concurrent or sequential. In a sequential mixed methods data collection, the data collected from one stage of the study contribute to the data collection of the next stage. Data collected in the consequent stage provide more information about results from the earlier phase of data collection and analysis and helps choose participants who can best provide that information. They could also help generalise findings by expanding study results from members of a defined population sample (Creswell and Plano Clark, 2011). The design of the mixed methods can include a variable sequence; the choice of quantitative methods followed by qualitative methods or vice versa (Creswell, 2013). In many studies regarding diversity and migration, a mix of qualitative and quantitative methods 'can explore the significance and relevance of ethnicity, and other modes of differentiation, in particular historical and social settings' (Olwig, 2013: 472). However, in such studies combining mixed methods, large-scale quantitative surveys of immigrants are often complemented by a qualitative research (Olwig, 2013). According to Carmona (2014), problems in the field of urban design are often '*wicked*' and multi-dimensional, and, therefore, adopting a mixing methods approach can offer significant advantages. A significant challenge for urban designers is to understand how public spaces can best respond to the preferences of the different cultural communities that may wish to use them. This has in turn led to the questions driving this research, namely, what are the methods that can help us to understand people's preferences for public space, based on their ethnic culture and how these might differ or overlap with others.

## The project

Streets are an important component of a city's public space network and therefore play a significant role in public life (Jacobs, 1961). In multicultural societies, streets are also where people from different cultural backgrounds encounter others. This project was undertaken to identify the physical characteristics that could support cultural diversity in the streets of increasingly multicultural New Zealand cities. A mixed methods approach was adopted as a means to connect



**Figure 1.** A comparison of the percentages of ethnic cultures living in each neighbourhood.

the different parts of the research question that do not sit comfortably within a single method. The following sections discuss each stage of the project in more detail.

### *The ethnographic fieldwork*

Conceptions of public space are constituted and re-constituted through dynamic and complex socio-spatial relationships. A growing body of work in urban design and planning reflects the growing interest in relational approaches to understanding spatial form (see, e.g. Dovey, 1999; Heynen, 2013; Madanipour, 2010). Yet, while relational approaches recognise the complex nature of socio-space, it is useful to utilise a pragmatic frame of reference to understand particular problems and their consequences (Khan et al., 2013). As the problems follow on from increasing population diversity and how this is reflected in the ways public spaces are used, this research has been framed in the area of environment-behaviour studies.

Environment-behaviour research suggests that use and perception of space varies between different cultural groups. Rapoport (1987) expresses the view that in general, walking and other street activities (static activities) are mainly a function of cultural and physical variables. While culture is often emphasised in environment-behaviour research, Rapoport (2005) advises that people's perceptions may vary in relation to their culture and the context, leading to expectations that these should be tested empirically. Ethnicity has been found to be an important variable influencing people's recreation and leisure activities. Ethnicity is a socially structured concept that relates a person to a social group based on mutual ancestry and culture (Sasidharan, 2002). Ethnicity and culture are used interchangeably in this article.

Many researchers and urban commentators (see, e.g. Cooper Marcus and Francis, 1998; Gehl, 1987; Jacobs, 1961; Lynch, 1960; Whyte, 1980) have stressed that urban design should be based on studies that include people and place interactions and how they use and otherwise experience urban environments. Ethnography in the field of architecture and urban design has been effectively employed to help plan for diversity and culturally sensitive design. These methods enable relationships between culture and the built environment to

be understood from the perspective of users by recording their direct experiences through observation and engagement. The researcher becomes embedded within the environment, enabling a more nuanced understanding of the matters affecting spatial relationships (Mazumdar, 1991).

### *Case studies*

Multiple case studies addressing a similar topic leads to findings that are more compelling than those from a single case study. The diversity of perspectives on the research question that multiple case studies provide for helps make such research more robust (Yin, 2003). Three streets were selected for study following a review of demographic characteristics of districts and neighbourhoods in New Zealand's two largest cities, Auckland and Wellington. The first case study was centred on Riddiford Street, Newtown, a Wellington neighbourhood renowned for its cultural diversity, but where Europeans remain the dominant cultural group. The second case study was selected in St George Street, Papatoetoe, an Auckland neighbourhood with a balance of all ethnic groups. The third case study was conducted in Great South Road in Otahuhu, a district that is dominated by Pacific Islanders (Figure 1). The streets are each the main thoroughfare in the suburb, based on the centrality and connectivity they have within the area's spatial network. They each have carefully managed traffic systems, exhibit similar macro characteristics (e.g. have a similar width dimension, spatial enclosure and sidewalk width), are symbolically diverse and have comparable combinations of land-use activities (shops, eating spaces, etc.). They also have closely related micro-scale physical characteristics (landscape, seating, etc.) and are popular social spaces.

The following paragraphs discuss several methods used for generating information about the ways people currently use public spaces or would like to be able to use them. Examining the cultural life of the three case studies considered daily street life as a research laboratory.

**Observation.** Observation is perhaps the most commonly used method in environment and behavioural research. Observation is seen as a method 'with a very limited investment of time the

investigators can achieve considerable insight into the actual use of designed places' (Cooper Marcus and Francis, 1998: 346). Observation and recording of people's activities or behavioural has been used in relation to documenting different persons' race/ethnicity in the studies of urban parks (Cohen et al., 2007; Hutchinson, 1987; Loukaitou-Sideris, 1995) and public markets (Watson, 2009) in multicultural neighbourhoods. Increasingly, however, it can be difficult to distinguish some ethnic groups from each other (Gómez, 2002).

There are a number of ways to record human activities and behaviour in public space. These include behavioural mapping, time lapse photography and video recording or making use of a global positioning system (GPS) device. Behavioural mapping was developed by Bechtel and Zeisel (1987: 22). It links design features and behaviour together in both time and space (Bechtel and Zeisel, 1987). Place-centred (or drawn) behavioural maps have frequently been utilised by urban designers, landscape architects and scholars as they are able to suggest relationships between places through spatial usage (Francis, 1984; Goličnik and Marušić, 2012). This method is typically used in micro-scale environments because this is a more convenient scale of space for a single researcher to observe. Mapping behaviours or activities in public spaces can best be supported by; a scale map of the observation area, determination of the behaviours that are going to be recorded, specific time schedules for observation and definition of the coding system by which behaviours will be recorded (Bechtel and Zeisel, 1987).

Time-lapse photography and video recording are also tools that can be used for recording activities (Whyte, 1980). However, while they are appropriate tools for observing general behaviours and counting the number of users in a space, they are not very useful for facial expressions (Bechtel and Zeisel, 1987). Moreover, cameras do not have the flexibility of the human observer to freely turn and rotate. Nevertheless, they can be used as supportive documents. GPS devices used to record activities could offer greater accuracy, but their use is not unproblematic. First of all, it may inhibit natural behaviour as the users must be selected in advance to wear the devices (Goličnik and Marušić, 2012; Goličnik and Ward Thompson, 2010). Second, distributing devices in public spaces that do not have clear entrances or control points could be difficult.

A base plan of each street was prepared, showing buildings, footpaths, fixed furniture, other landscaping elements and the carriageway. Walk-by observations recorded the different stationary, lingering and social activities taking place along the streets. During observation sessions, the authors walked slowly along the complete length of the study area to record the different activities and where they were taking place, the number of people participating in these activities and their general characteristics (approximate age, gender and ethnicity). People interacting with each other or engaging in different types of activities with others (as pairs, groups of three, etc.) were circled on the coding maps to

record these as group activities. The maps were complemented by field notes and photographs as they happened in the true environment.

The project set out to also code people's ethnic backgrounds in the behavioural mapping exercise. Codes were developed for the four largest ethnic groups in the New Zealand population, based on the most recent census. Others not clearly fitting into European, Māori, Pacific Islander and Asian ethnic classifications were recorded separately.

A pilot study was conducted and it quickly became apparent that there would be a high risk of incorrectly distinguishing between Māori and Pacific Islanders. Accordingly, for the behaviour mapping exercise, these ethnicities were coded under one group. Overall then, people's ethnic backgrounds were recorded based on observation in four categories: European, Māori/Pacific Islander, Asian and others. Walk-by observations were conducted every hour between 10:00 AM and 6:00 PM on both weekdays and weekends between March and April with different cloud cover and wind conditions, and no observations were conducted when it was rainy. The research methodology received an approval from the Human Ethics Committee (HEC) of Victoria University of Wellington (issued number 19607).

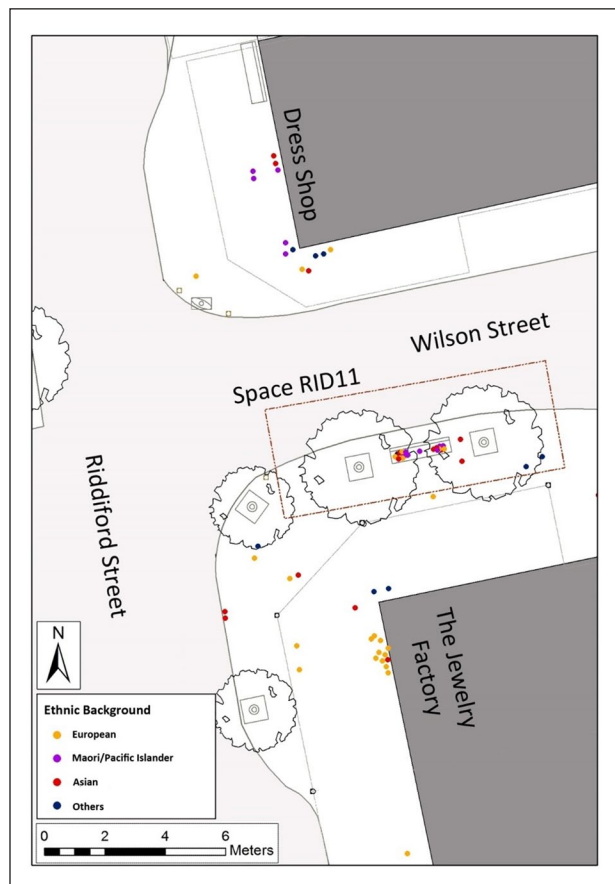
## Analysis

The manual data collected from each observation were then transferred into GIS software for analysis. The GIS tool generated a rich database that could be filtered to highlight relationships between activities, locations, people's characteristics and the weather. Arranging the data in different layers enabled different occupancy patterns to be analysed relative to the spatial configuration and design attributes of different spaces (Al-kodmany, 2000a; Goličnik and Ward Thompson, 2010). Each point in the GIS database represents a person and the data associated with their behaviour (Figure 2). The researchers interrogated the layers of data to understand how different occupancy patterns might relate to the spatial configuration and design attributes of footpath spaces. In particular, we were interested in the following:

- The locations where most of the stationary activities took place
- The locations where most people contributed to social activities
- Similarities and differences between different cultures in terms of activities and places where their activities occur

The data were then analysed in relation to the locations of various behaviours and different cultural groups to identify their association with different features of the footpaths and business activities. Table 1 shows how data were summarised for each space along Riddiford Street.





**Figure 2.** Use of behaviour mapping and GIS-enabled patterns of occupancy among different ethnic groups in different spaces to be assessed.

Face-to-face interviews with people in each of the three streets provided opportunities for the observed behaviours to be elaborated upon. Interviews are understood to be the most commonly employed method in qualitative research and ethnography. According to Bryman (2012), questions in ethnographic and qualitative research are usually open-ended and flexible, ‘responding to the direction in which interviewees take the interview’ (p. 470). The open-ended nature of the interviews also provided information on emergent and unexpected aspects that did not necessarily appear in observations. While unstructured interviews might only contain a single question and are often similar to a conversation, semi-structured interviews enable the interviewer to direct the conversation towards the specific topics of interest (Bryman, 2012). In this case, the semi-structured interview approach was deemed to be more useful and was designed as a kind of flexible and broad survey. The interviews examined the nature of participants’ street-based activities, the places they selected to conduct these activities and the rationales for the choices they made. Participants’ suggestions for improving the street environment were also recorded to help understand the needs and expectations of people from different cultural

backgrounds, particularly where suggestions differed. In general, the interviews were designed and divided into three sections. The interviews started with demographics, such as the participant’s cultural background, homeland, age groups, level of education, length of live/stay in New Zealand and level of familiarity with the street.

In the second section of the interviews, participants were queried about their social/leisure activities on the street without reference to cultural background. In general, the questions in this part were based on the participant’s activities and where these took place, their preferences for street features particularly as they might influence their activities, the duration of activities, and preferred time for visiting the street.

According to Carr et al. (1992), the best way to understand people’s needs in urban public space is to ask them the means in which the current context meets with their cultural expectations. In the third and last sections of the interview, the researchers asked participants about their specific cultural activities and types of environments that accommodated their needs in more detail and in which ways in their opinion street spaces could be designed and maintained, so that they would accommodate their ethnic social activities.

To capture the views of a broad range of people, interviews were conducted at different times of day and on different days of the week. Recruitment sought to secure input from diverse ethnic classifications in connection with the behaviour mapping exercise. People who were observed sitting, standing and otherwise lingering along the street were approached randomly and in accordance with guidelines on human ethics. The time for the interviews ranged from 10 to 50 minutes, with an average time of 15–20 minutes. Frequent users of the street spent more time answering the questions.

Table 2 summarises the nature of the data collected through behaviour mapping and interviews methods described above. In total, 87 persons were interviewed: 16 European, 22 Māori, 26 Pacific Islander and 23 Asian. Interviews were transcribed and coded for analysis.

A coding system was defined based on the theoretical framework of the study for the open-ended questions. The coded information was employed to conduct a comparative analysis within each cultural group and between different ethnic cultures to understand the similarities and differences between their perceptions and preferences for choosing various street spaces for social activities. NVivo 10 software was utilised to organise and analyse content from the interviews.

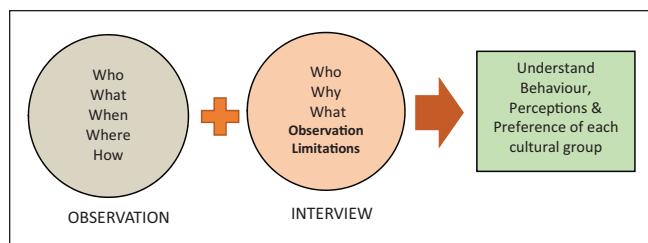
The information from the observations and interviews was used to conduct a comparative analysis of the street characteristics that support stationary and lingering activities in each of the case study areas (Figure 3). As noted, the aim of the article is to discuss the research methodology, the findings are discussed only briefly here. Doing so will also help illuminate the comparative advantages and limitations of the ethnographic research.

**Table 1.** Physical, social and land-use characteristics of different spaces with public seating on Riddiford Street.

Space	Sidewalk width	Trees	Shade	Type of business	Level of activities on the sidewalk	Number of seats	Seating arrangement type	Zone	Number of activities									
									E	M/PI	A	O T						
Riddiford Street																		
RID1	3–4 m	Yes	No	Newtown School	Low	3 × 2 = (6)	Type 2	A	10	1	3	1	15					
RID2	5–6 m	Yes	Yes/no	Services/food	Medium-high	1	Individual	C	6	2	0	0	8					
RID3	8–9 m	No	Yes/no	Services/food	Medium-high	1	Individual	A	17	7	0	1	25					
RID4	8–9 m	Yes	Yes/no	Services/food	Medium-high	1	Individual	C	6	2	1	1	10					
RID5	6–7 m	Yes	Yes/no	Services/food	High	2	Type 1	C	1	1	0	2	4					
RID6	6–7 m	No	Yes/no	Services/food	High	2	Type 2	A	20	18	0	7	45					
RID7	3–4 m	No	Yes/no	Historic building	Low/medium	1	Individual	A	5	3	0	0	8					
RID8	5–6 m	Yes	No	Services	Low/medium	2	Type 1	C	8	0	4	0	12					
RID9	4–5 m	Yes	Yes/no	Services	Medium-high	1	Individual	C	3	4	0	0	7					
RID10	5–6 m	Yes	Yes/no	Services/food	Medium-high	1	Individual	C	12	6	3	0	21					
RID11	3–4 m	Yes	Yes	Services/food	Medium	1	Individual	C	6	8	6	3	23					
RID12	4–5 m	Yes	Yes	Park	High	4	Type 2	Park	16	9	4	3	32					
RID13	5–6 m	No	Yes/no	Services/food	Medium	2	Type 1	A	9	4	1	2	16					
RID14	4–5 m	Yes	Yes/no	Services/food	Medium	2	Type 2	C	5	2	2	0	9					
RID15*	2–3 m	No	Yes	Services (location of taxi drivers)	Medium	1	Individual	A	7	4	5	17	34					
RID16	3–4 m	Yes	Yes/no	McDonald's	Low	2	Type 1	A	6	4	0	0	10					
RID17	6–7 m	No	Yes/no	Services	Low	1	Individual	A	5	2	0	0	7					
RID18	3 m	Yes	Yes	Chapel	Low	1	Individual	A	4	5	0	0	9					

**Table 2.** Number of observations (O) and interviews (I) of each cultural group in the studied streets.

Case study	Riddiford Street		St George Street		Great South Road		Total	
	O	I	O	I	O	I	O	I
European	820	9	107	5	122	2	1049	16
Māori/Pacific Islanders	332	15	410	13	1806	18	2548	46
Asian	163	6	299	9	611	8	1073	23
Other	86	–	13	–	15	–	114	–
Total	1401	30	829	27	2554	28	4784	85

**Figure 3.** Observations and interviews help understand behaviours, perceptions and preferences. Adapted from Mehta's (2006) diagram on "Lively Streets".

Standing, window shopping, sitting and talking were the main activities observed across all three cases and across all ethnic classifications. Although they were similar in nature, depending on the spatial characteristics and commercial activities on offer, the proportions of each varied between behaviour maps.

Retail tenant mix and the diversity of shops offering goods and services on the street are the main reason people are attracted to use the footpaths. Many of the businesses that offered daily goods and services, such as fruit shops, supermarkets and banks were most commonly preferred and attracted people from different cultural backgrounds into the street environment. The results also confirmed that others, such as ethnic delicatessens, targeted specific cultural groups. Ethnic shops and restaurants had a greater role for Asians and Pacific Islanders compared with Māori and Europeans. A large number of static and social activities of these groups of people took place in close proximity to such businesses.

There were notable differences in the social structure and group sizes between ethnic cultures. People with European ethnic backgrounds were generally involved in smaller sized groups and these groups were often gender mixed. Māori/Pacific Islander were observed to gather and socialise in small or large group sizes. Observations and interviews confirmed that a higher proportion of the larger group sizes comprised Pacific Islanders. The social structure of their groups is often gender mixed and young children have become an important constituent.

In a broader sense, patterns of occupancy of seating along each street depended on the mix of business activities, and their associated characteristics. For example, few Europeans were recorded sitting in St George Street and

Great South Road, where they considered the business activities unappealing. The higher numbers of seated activities of Asians on St George Street could also be seen to reflect their preferences for the surrounding businesses and the general atmosphere of the street, all of which are decidedly Asian.

In general, observations and interviews could not distinguish between preferences for public bench seating types of the different ethnic groupings. However, it also became clear that the patterns and rhythms of use were influenced by adjacent businesses. The benches close to businesses that targeted specific ethnic groups or genders were frequently occupied by those groups. However, what was common among all well used benches across the cases was that all were located in the active sections of the street, surrounded by activity supporting businesses. This could be explained by similar findings by Whyte (1980), Gehl (1987) and Mehta (2006), which are that people seek liveliness, activity and engagement while relaxing and do not like to be completely separated from the city life, people and their activities.

Observations did not show much correlation between landscaping and number of stationary activities, however, landscape and planting were mentioned by participants of various cultures. Other factors that occurred most frequently in the interviews included seating availability and their associated characteristics; the distance they were located from road and pedestrian traffic, and shop displays and shop front management.

The focus of the first stage of the study was the behaviour, perceptions and expectations of users in the built environment. It was concerned with social use and peoples' experience of public space. There were no references to visual aspects of the environment. The ethnographic research provided data for three specific streets, each of which attracts a range of ethnic groups, albeit not in equal representation. Furthermore, the physical characteristics of each sidewalk were different from the others and were mainly influenced by business activities. Observations and interviews suggest that it is difficult to assess preferences for design characteristics of sidewalk spaces. Thus, to address contemporary and proposed design advice and to widen the study to be more inclusive, a further study that would enable the effects of the social environment to be minimised and that would provide correlational data were designed.

### *The visual preference survey*

Surveys are most frequently used in research that investigates socio-cultural interactions or perceived meanings of environments. Survey questionnaires give the researcher the possibility to associate the behaviour of each group with the design features (Groat and Wang, 2002). While full-scale mock ups might seem the best way to examine built environments, they are not practical as they are expensive, time-consuming and complex (Seaton and Collins, 1972).

A visual preference survey (VPS) is a method for gaining public response on physical design choices to evaluate and promote planning and design (Al-Kodmany, 2002). VPSs are known as a tool for democratic decision-making and planning within communities (Al-Kodmany, 2000b; Nellessen, 1994).

Visual simulations have been used in a number of studies and are considered to be a reliable tool in recording preferences (Bosselmann and Craik, 1987). They are recognised to be as effective as other methods that gather responses from individuals in real settings (Sanoff, 1991). Visual images have been employed more often for illustrative purposes than for conducting empirical studies in the field of environment and behavioural research (Hartig and Staats, 2005). Scholars propose that perception is more closely related to the possible functions that the environment affords rather than to its physical and structural aspects (Gibson, 1979; Heft, 1997). Aesthetic components, landscapes and physical spaces are also referred to as commodity components, capable of accommodating behaviours and activities (Lang, 1987). Thus, preference could be related to the opportunities they offer for different and specific behaviours of their users (Hartig and Staats, 2005). They could be a useful tool to measure preferences of different cultural groups based on behavioural responses to a certain design milieu.

The qualitative research method used in the first stage of the research guided the authors to develop a comprehensive questionnaire which included quantitative and scaled measured questions. A smaller framework was extracted from the main framework based on the findings from the first stage of the research to examine the planning and design of footpaths and (shop front) management in New Zealand as a multicultural society. The important social and environmental criteria identified through the first stage of the study were integrated with the design of the second stage. A visual preference study was conducted as a part of the online survey. This approach was used to define design attributes that influence each cultural group's preference in choosing specific micro-environments for their desired activities in the context of streets.

Single and multiple variables based on the framework of the study were included in the questionnaire. The variables included seating and its associated characteristics, landscape elements, shop displays, colour, tables, and pavement materials. The images illustrate relationships between different

variables to narrate a story. Response stimuli were photographs of computer-simulated images illustrating potential footpath spaces. Each simulation set constituted two to five images and these were displayed vertically on one side of a web page. For example; participants were asked to rank different types of shop frontages as a part of the survey. Shop fronts were categorised into six themes (see Figure 4). The selection of images was so that they were most representative of shop fronts of the studied areas.

In an attempt to understand what types of seating are appropriate for sidewalks, the VPS addressed a range of seating conditions and seating arrangements. The seating conditions examined a bench under different condition types; images varied from one another by shop frontage, seating location, seating orientation and type of landscape edging the footpath. The topic of landscape had been frequently raised during the first-stage interviews. In addition, many people noted that they preferred seating that was set back from a busy road. This led the researchers to investigate whether landscaping could serve as a buffer between seating and traffic. Three landscape types were specified. Landscape type, L1: no landscaping along the edge. Landscape type, L2: short landscaping along the edge which provides a view to the road and the traffic. Landscape type, L3: tall landscaping along the edge that acts as a visual barrier to the road and traffic. Shop frontage management is also an important issue for seating located in zone 'C', where the bench faces the sidewalk and the shop frontage but backs on to traffic. To make a better comparison between different seating types, three shop frontage types that were most commonly seen in the case study streets were represented. One pertained to businesses that kept their goods inside the shop (SF1). The second shop front contrasted with this condition by allowing their goods to spread out onto the sidewalks (SF2). Finally, cafés with sidewalk seating were considered as the third type of frontage (SF3).

Following observations and interviews that suggested current sidewalk seating types did not accommodate larger groups' activities (look at Figure 5), the VPS examined a range of seating arrangements. The purpose was to measure how supportive each group felt about a variety of seating arrangements in sidewalk spaces while visiting by themselves or with their ethnicity centred group. Finally, survey participants were asked to state their preferences for different pedestrian density levels while seated and facing onto the sidewalk.

Respondents were invited to rate each scene on a seven step Likert-type scale. Conducted through the Internet, the survey enabled any effects created by the social environment to be minimised and widened the study to become more inclusive. A total of 181 people, 78 males (43%) and 103 females (57%), participated in this second research stage. The sample included 41 Europeans (23%), 32 Māori (18%), 34 Pacific Islanders (19%), 46 Asians (25%) and 28 (15%)





Figure 4. Different sets of shop frontages were tested in the VPS.



Figure 5. Walk-by observations revealed how different ethnic groups use footpaths. Right image: Riddiford Street, Newtown: Europeans were the main users of café seating and most activities occurred in smaller groups. Left image: Great South Road, Otahuhu: Pacific Islanders frequented the street in larger groups. In the interviews, they suggested the number of seating and the way seating is arranged on sidewalk spaces does not accommodate their needs.

from other ethnicities, such as North or South American, African, Middle Eastern.

**Analysis**

Methods of analysis for the VPS included generalised estimating equations, repeated measures analysis of variance (ANOVA), and one-way ANOVA. Numerical values were used for processing the data analysis. The researchers tested whether the mean response (1–7) differed by group and the

mean response was used to measure preference for various designs and management of the tested characteristics.

The highest mean preference among all cultural group related to café seating on the footpath, followed by boutique and open shop window displays. On the other hand, shop displays out on the footpath had the lowest mean preference among all shop frontage types. There was a significant difference in the mean preference for shop displays out on the footpath by cultural group ( $p=.004$ ). Europeans and Māori had a significantly lower preference for shop displays

spreading onto the footpath than did Pacific Islanders. This confirmed the findings of the ethnographic fieldwork in the first stage (triangulation; Table 3).

There were no significant differences in preferences for fruit and veg shops displaying their items on the footpath, boutique and open shop window displays among different ethnic groups. Europeans had the highest mean score for café seating on the footpath, followed by Pacific Islanders, Māori and others. Asians showed lower levels of interest for café seating compared with other cultural groups. This might be related to their footpath activities where they usually do not use the footpath spaces for eating/drinking and might also relate to their higher preferences for shops displaying inside their premises.

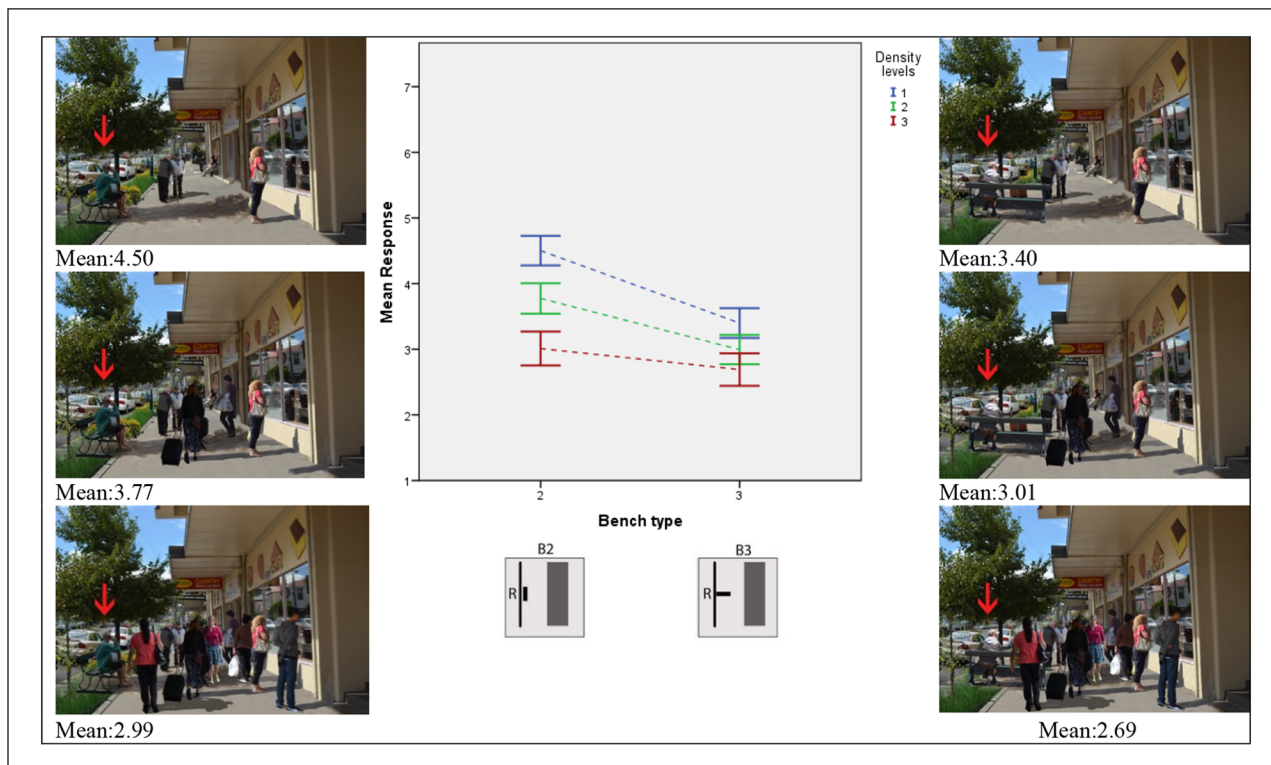
The survey did not reveal any differences in preference for seating conditions between different ethnic groups ( $p=.779$ ), but it did suggest that the location and orientation of benches and how they relate to other characteristics, such as landscaping, shop frontages and population density ( $p=.1$ ) does influence choice. Landscaping treatment along the sidewalk edge was very important. Planning for low landscaping along the kerbline would increase the chance that users would have a broader outlook while having their backs protected by buildings along the street. However, the height of landscaping is not a factor when the bench has its back towards traffic. A seating bench placed perpendicular to the sidewalk received the lowest preference rating of all seating conditions presented to survey respondents. Although landscaping treatment was of lower importance while seated perpendicular to the sidewalk than in other seating conditions, there was a preference for some form of landscaping over having none.

In general, participants favoured the organised shop frontage and café frontage compared with the shop frontage spreading onto the sidewalk relative to parallel or perpendicular seating conditions. It appears that people would not like to sit where the bench faces the sidewalk and a café with outdoor seating and activities as much as they would like to sit in front of an organised shop front without outdoor activities. This finding conflicts with the findings of the observations where seating locations and activities show strong associations. One explanation could be that people like to observe dynamic activities while seated but feel less comfortable to face sedentary activities directly. Urban designers should, therefore, recognise personal space preferences and the concept of proxemics (Hall, 1966) when locating benches near business activities.

While observations show that benches with fewer activities surrounding them were less frequently occupied, many participants mentioned they would choose seating spaces that were distant from the crowd. Similarly, findings of the VPS suggested that lower densities of people were preferred to simulations exhibiting higher levels (Figure 6). Accordingly, urban planners and designers are advised to plan for low density around seating areas as all different ethnic cultures

**Table 3.** Comparison of mean preference scores ( $\pm$  standard deviation) among groups for different types of shop frontages.

Type of shop frontages	Europeans	Māori	Pacific Islanders	Asians	Others	All groups	F	p-value
1 Shop displays out on the footpath	2.95 ( $\pm$ 1.564)	3.16 ( $\pm$ 1.439)	4.29 ( $\pm$ 1.661)	3.46 ( $\pm$ 1.486)	3.68 ( $\pm$ 1.486)	3.48 ( $\pm$ 1.601)	4.006	.004
2 Fruit and veg shops	4.88 ( $\pm$ 1.631)	4.38 ( $\pm$ 1.561)	5.00 ( $\pm$ 1.255)	4.20 ( $\pm$ 1.600)	4.75 ( $\pm$ 1.143)	4.62 ( $\pm$ 1.496)	2.097	.083
3 Shops displaying inside their premises	3.49 ( $\pm$ 1.777)	3.97 ( $\pm$ 1.636)	4.21 ( $\pm$ 1.572)	4.63 ( $\pm$ 1.583)	4.57 ( $\pm$ 1.574)	4.17 ( $\pm$ 1.675)	3.244	.013
4 Boutique and open shop window displays	4.95 ( $\pm$ 1.448)	5.00 ( $\pm$ 1.391)	5.44 ( $\pm$ 1.078)	5.02 ( $\pm$ 1.256)	5.29 ( $\pm$ 1.410)	5.12 ( $\pm$ 1.319)	.910	.459
5 Café seating on the footpath	5.80 ( $\pm$ 1.327)	5.34 ( $\pm$ 1.382)	5.74 ( $\pm$ 1.163)	4.83 ( $\pm$ 1.371)	5.37 ( $\pm$ 1.395)	5.37 ( $\pm$ 1.395)	3.617	.007
6 Open shop frontages	4.44 ( $\pm$ 1.598)	4.59 ( $\pm$ 1.241)	5.15 ( $\pm$ 1.500)	4.54 ( $\pm$ 1.206)	4.39 ( $\pm$ 1.499)	4.62 ( $\pm$ 1.419)	1.574	.183



**Figure 6.** Mean and 95% confidence interval of preference for different types of densities while seated on various bench types.

preferred to sit on benches with a fewer number of people. This could be achieved by increasing the width of the sidewalk in seating areas with medium or high-density levels.

The ethnographic sourced data indicated that the planning and design of neighbourhood streets do not meet the needs of different cultures who use them. Observations in Great South Road revealed that many Pacific Islanders frequented public benches in larger groups; sometimes up to nine people. However, the numbers and arrangements of seating did not accommodate for sitting activities of larger groups. Some members had to stand or lean or even squeeze together on the benches within these groups. Even when adequate numbers of seats were provided, they were often located far away from each other and could, therefore, not be used appropriately for social activities by the group members. Considering such issues, a range of seating arrangements were addressed in the VPS. Socio-fugal arrangements were preferred more for individual activities and socio-petal arrangements were favoured for social activities. The type of seating arrangements that each cultural group preferred was mainly influenced by the number of members in their groups (Figure 7).

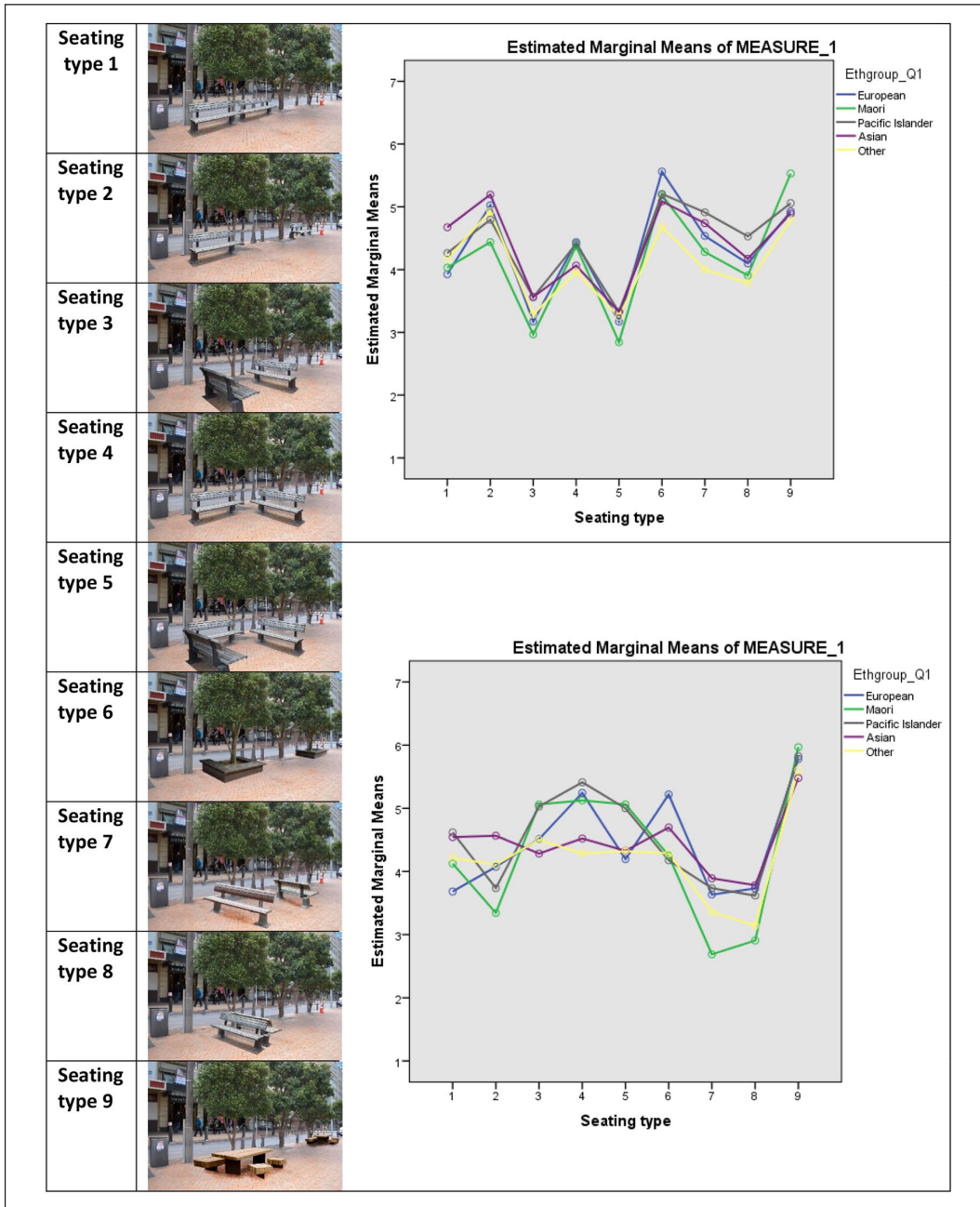
In general, the findings of the VPS identified those aspects of footpath design and *management* that are constant and invariant and those that varied between cultures. This enabled the researchers to propose design attributes of culturally responsive urban footpath spaces. The second stage confirmed some outcomes of the first stage, which provided greater confidence in the stated findings. It also suggested

possible differences between groups and revealed circumstances where people’s behaviours differed from stated preferences (Figure 8). Maintaining an appropriate balance between these conflicting needs underlies the challenges of serving a diverse population.

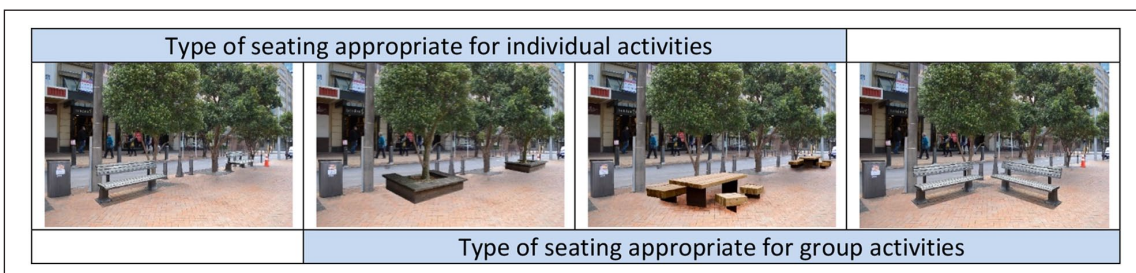
### Discussion

The project helped illuminate how multiculturalism can be manifested through relationships between the built environment and social behaviour in public streets. A complementary mix of research methods, designed to generate qualitative and quantitative data, enabled street characteristics at different levels of planning, management and design to be more readily understood. The combination of these approaches drew on the strengths and balanced the weaknesses of each. The ethnographic approach of fieldwork research enables examination of different individual and group behaviours and activities in public streets. The different methods generated a more holistic view of social life in these spaces, incorporating the perceptions of users, their motivations for using the space for leisure and social activities and their expectations/specific cultural needs. The findings based on the use of such methods are performance oriented; they enable better understanding of how people use the space, what motivates them to use and linger in street spaces and what spatial characteristics might encourage them to visit more often and for longer periods of time. Data from pre- and post-occupancy



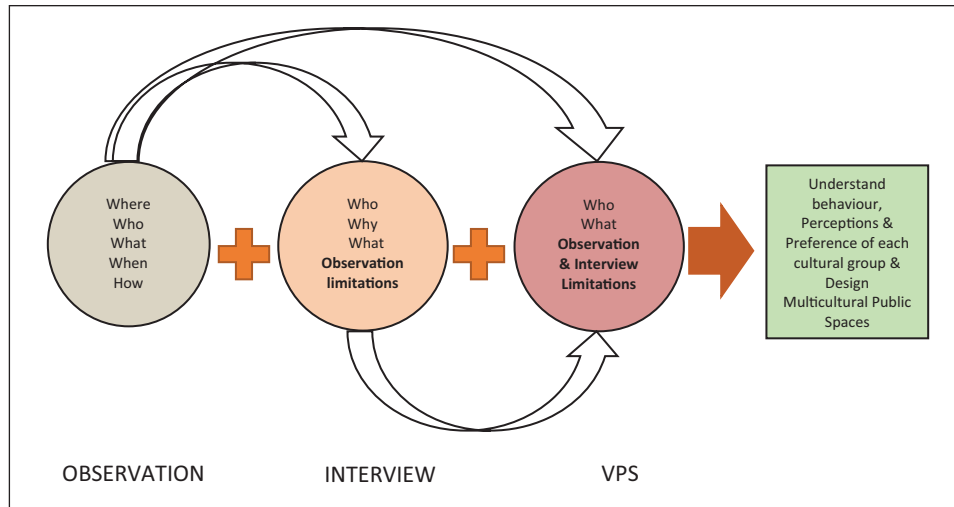


**Figure 7.** A section of the VPS addressed different seating arrangements. The purpose of this section was to measure how supportive each group felt about a variety of seating arrangements in footpath spaces. Figure shows preference for different types of seating arrangements for individual (top-right) and social activities (bottom-right) by different ethnic groups.



**Figure 8.** Recommended seating arrangements for both individual and group activities.





**Figure 9.** Observations, interviews and VPSs create comprehensive and robust data and help shape how we design public spaces in multicultural societies.

evaluations are very valuable in providing recommendations for design practice.

While there are many benefits within suggestions derived from empirical evidence, there can also be a number of limitations with results obtained from ethnographic field research. A key question is the extent to which the data are generalisable to different communities and groups. Results are often derived from the qualitative analysis of a single or a small number of case studies. Therefore, one issue that might arise is the comparability and compatibility of the data. The design attributes in each case study, their locations and arrangements vary. The demographic and socio-economic characteristics, the functions and density of the surrounding context of the case studies are also different and they are likely to influence the activities and patterns of use within a space. These are the potential limitations of ethnographic methods that must be considered before generalising the findings to different areas within the same city, to other cities and indeed, to different populations. While the data from the case studies could be rather speculative (based on what the public space has on offer and the cultural backgrounds of the users), attempts to find generalisations from the findings could make important contributions to our understanding and create more robust and comprehensive data. Therefore, data from fieldwork research could be accomplished and generalised using a quantitative method such as a survey. Surveys are the most commonly used tactic for data collection strategies in correlational research (Groat and Wang, 2002).

The data based on observations and interviews could also be used to explore the spatial relationship between preference and design in more depth and detail. Results gained from ethnographic research could be used for simulating various design proposals. Simulations can help to test design proposals among different ethnic groups to in order to be

more equally inclusive. The proposals could be distributed among different cultural groups using surveys.

As noted, the findings from ethnographic fieldwork tend towards qualitative and can have limited generalisability. Surveys, on the other hand, can develop findings across different ethnic groups. The advantage of visual simulation surveys compared with surveying people in actual places is that they can be manipulated to focus attention on key design attributes while keeping others constant (Stamps et al., 2005). This allows the effect each attribute has on preferences and appreciation of the environment to be examined separately and in relation to each other. Furthermore, environmental factors, such as noise and odours are able to be disregarded in photographs and images (Nasar and Hong, 1999). Taking a mixed method approach and combining the results of each method could provide a database that serve as a comprehensive spatial design for multicultural public spaces. While the qualitative method of the fieldwork research can make meaningful spatial relationships and understand user needs and expectations, the surveys can provide statically significant outcomes of specific preferences among different cultural groups. The limitations within the observations and interviews could be accomplished by VPSs (Figure 9). The selected physical design variables among different groups together with the spatial relationships between behaviour and design could help shape new public space design.

Despite the many advantages, there are a number of limitations embedded in the design of the chosen methodology. First, it considers ethnicity as a homogeneous concept while there are possible differences between the members of each cultural group. It should be noted that 'the concept of cultural diversity calls for an openness towards a great variety of possible forms of differentiation and belonging, and the ways in which they may be brought into play in social life' (Olwig, 2013: 472). The opportunities that an environment affords

are not perceived and taken up in the same way by different individuals within the same (ethnic) culture. Other factors, such as gender, age group, socio-economic situation, place, religion and the levels of acculturation also have a significant role in moulding attitudes, preferences and behaviour in public space. The VPS shows multiple choices for participants to select their preferences, helping with more democratic decision-making. At the same time, the researchers are the ones selecting the range of images to show to participants.

## Conclusion

This article has described a novel way of integrating data sourced through quantitative and qualitative methods to arrive at a rich and comprehensive understanding of the nature of multicultural public spaces. The methodology combines field observations, structured interviews with people and VPSs to explore the complexity of issues affected the ways public space is perceived and used by different ethnic cultural groups. The combination of methods proposed in this article is distinguished from the methodologies used in many earlier studies of public space use, which have tended to employ a single method. The methods were deployed in a multiple case study of public street use in New Zealand (Lesan, 2015).

The first stage of the research conducted a socio-cultural analysis of people along three urban streets, focussing on the physical characteristics and activities taking place along the streets. Engagement with the users supplemented explicit empirical evidence and provided multi-dimensional perspectives on the social life of these streets. The second stage took the findings of the first stage a step forward and examined a number of design attributes using computer-aided simulations. The design of the second stage of this study integrated a number of design attributes into simulations and examined ethnic group preferences among them. Together, these two stages enabled the research team to better understand how footpath spaces should be designed and managed to become more multicultural.

For example, the first stage provided the locations that benches should be placed (in terms of type of business and activities) to be used more frequently. The second stage also suggested the preferred type of furniture and other design attributes among different cultural groups. The mix of methods enabled the findings to be comprehensive and robust. This process generated a rich, multidimensional understanding of how four ethnic groups currently use and would like to use streets in New Zealand.

The findings established the value of the methodology in revealing the relationships between design and use in multicultural public spaces. The combination of observations, interviews and VPSs has led to a better understanding of the characteristics of the environment that promote cultural diversity. This methodology could be useful for future designers as it provides detailed guidelines for designing public space in multicultural societies.

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