Positioning Paper

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Modelling crowding in Aboriginal Australia

authored by

Paul Memmott, Christina Birdsall-Jones, Carroll Go-Sam, Kelly Greenop and Vanessa Corunna

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Authors	Memmott, Paul	University of Queensland
	Birdsall-Jones, Christina	Curtin University
	Go-Sam, Carroll	University of Queensland
	Greenop, Kelly	University of Queensland
	Corunna, Vanessa	Curtin University
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ACRONYMS

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ARIA	Accessibility/Remoteness Index of Australia
ATSIC	Aboriginal and Torres Strait Islander Commission
ATSIS	Aboriginal and Torres Strait Islander Services
BBF	Building a Better Future
CHINS	Community Housing Infrastructure and Needs Survey
CHIP	Commonwealth Housing Infrastructure Program
CNOS	Canadian National Occupancy Standard
COAG	Council of Australian Governments
CRA	Commonwealth Rent Assistance
CSHA	Commonwealth State Housing Agreement
FaHCSIA	Australian Government Department of Families, Housing, Community Services and Indigenous Affairs
NATSIS	National Aboriginal and Torres Strait Islander Social Survey
NIHG	National Indigenous Housing Guide
HHIMG	Housing and Homelessness Information Management Group
HHPRWG	Housing and Homelessness Policy Research Working Group
HMAC	Housing Ministers' Advisory Committee
HMC	Housing Ministers' Conference
ICH	Indigenous community housing
ICHO	Indigenous community housing organisation
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NAHA	National Affordable Housing Agreement
NRF	National Reporting Framework
SAAP	Supported Accommodation Assistance Program
SCIH	Standing Committee on Indigenous Housing
SIHIP	Strategic Indigenous Housing Infrastructure Program
SCRGSP	Steering Committee for the Review of Government Service Provision
SOMIH	State owned and managed Indigenous housing
WAACHS	Western Australian Aboriginal Child Health Survey

EXECUTIVE SUMMARY

This Positioning Paper seeks to explore and define the necessary concepts and theory relevant to upcoming empirical research into Australian Aboriginal household crowding by the authors. As will be explained in this Positioning Paper, the word 'crowding' is used in preference to 'overcrowding' advisedly. This follows international social science usage which employs the term 'crowding'. The international literature on household crowding is well established, as is shown in the discussion herein. Fundamentally, there is a logical dissonance in the term 'overcrowding'. A domicile is crowded or it is not, and to over-qualify this by referring to it as overcrowding is tautological.

We seek to provide a model of crowding that is based on the stress component of crowding rather than the density model. Household crowding stress is a culturally determined phenomenon, whereas a density model is determined only by numbers of inhabitants arbitrarily allotted sleeping space in certain combinations of numbers and genders. Examples of the density model currently in use in Australia include the Canadian National Occupancy Standard (CNOS) (ABS 2008) and the Proxy Occupancy Standard (POS) (AIHW 2005). These models have been used in Australia to predict and determine Aboriginal crowding without any demonstrated evidence of success based on a systematic Post Occupancy Evaluation (POE). These and other models will be reviewed and defined in the context of the discussion that follows.

In contrast, the international literature has for the last 40 years emphasised the characteristics of culture, place, and personal/subjective responses according to situational or antecedent factors rather than a simple physical ratio of person in relation to arbitrarily allocated space. It is not unlikely that the CNOS and the POS are useful tools of assessing overcrowding in Anglo-European cultures; however, their use in the Australian Aboriginal context is questionable and it is the purpose of this project to investigate the parameters of a new and more suitable model.

This Positioning Paper begins with a review of the density models of crowding followed by a detailed review of the international literature on the stress model of crowding. This review includes discussion and definition of the characteristics and concepts of the stress model in various cultural settings including Asia, and to some extent Europe. It goes on to discuss the Australian literature on Aboriginal household occupancy and crowding.

In this portion of the discussion we seek to establish from the literature the characteristics of Aboriginal residential behaviour in various climatic, regional and domiciliary settings, including here the need to understand the relationship between the Aboriginal family type, kinship models and domiciliary requirements. A key concept in understanding Aboriginal housing requirements is household dynamics; that is, the ways in which the use of various rooms may alter according to season, overall climatic conditions, regional housing vernacular, and the changing needs of Aboriginal households according to mobility and visiting patterns.

In part 2 of the Positioning Paper we go on to provide observations from empirical studies of a number of Aboriginal communities across the ranges of time, place and research focus. From these we both demonstrate the need for a new model to explain Aboriginal crowding behaviour, and the concepts we have been able to glean and apply from the review of the international crowding literature.

Our analysis shows that given the high density of many Aboriginal households, the techniques to minimise and avoid crowding include a combination of socio-spatial divisions, observance of avoidance and respect rules, punishing any rule violation with

shaming, adjusting spaces where possible with flexible architectural elements and, ultimately, especially under high stress, the deployment of residential mobility within kin networks.

Finally, we conclude by discussing the difference between households with a high occupancy level which are rule governed, orderly and not crowded, as opposed to households with high occupancy levels which—because they fail to achieve rule-governed combinations of compatible relationships and fail to control substance abuse—are indeed crowded and characterised by varying levels of disorderly behaviour.

1 INTRODUCTION

This Positioning Paper provides a review of the relevant literature on models of household crowding used internationally. It then reviews selected case studies from research on a number of Australian Aboriginal communities in the varying settings of remote, regional and urban areas. While crowding can be said to exist at various scales such as the household, the building and the neighbourhood (Gillis et al. 1986, p.692), our focus here is primarily on household crowding, which in Aboriginal context usually comprises a combination of indoor and outdoor living spaces and semi-enclosed living areas.

In the social sciences, models have employed a stress definition of crowding for at least 40 years. In contrast, Australian policy-makers, particularly in Indigenous housing, have consistently employed density models (usually persons per bedroom), including during the policy period of the Aboriginal and Torres Strait Islander Commission (ATSIC). Such models have in turn dictated the distribution of Commonwealth housing funds to Aboriginal communities under the Commonwealth Housing Infrastructure Program (CHIP) in the 1990s and early 2000s. When the Strategic Indigenous Housing Infrastructure Program (SIHIP) commenced in 2008, the reduction of crowding was a primary policy goal of this program also, driven largely by family violence and child abuse reports (particularly the *Little Children are Sacred* Report of July 2007 by the Northern Territory Board of Inquiry into the Protection of Aboriginal Children from Sexual Abuse). However, it will be argued here that without a knowledge of the Aboriginal constructs of crowding and the specific values and rules that, if broken, can generate stress and loss of control, policy-makers cannot readily guarantee the accuracy, efficacy or validity of their crowding measures. Nevertheless recent media statements from the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaCHSIA) continue to stress the importance of reducing Aboriginal household crowding to increase child safety (ABC News online 2011).

Sanders (2008) discusses the dominant approaches to Indigenous policy issues in Australia over the last 40 years which have alternated between striving for equality on the one hand, and the recognition of difference on the other. Elsewhere, one of the current authors (Memmott 1990, 2011) has described these policy approaches as mainstream versus culturally targeted service delivery respectively. Sanders argues that equality issues have been favoured in recent mainstreaming policy trends, but reminds us that social justice can at times be better achieved through the recognition of the different needs of Aboriginal groups. He argues that a focus on nationwide statistical analysis of Indigenous people's status in, for example housing, should be complemented with a more specific qualitative approach to Indigenous housing needs (Sanders 2008, pp.96–7). In our view this would include a measure of crowding which is tailored to Indigenous cultural practices and values.

From the review of the international social science literature we seek to derive the basic cross-cultural parameters taken into account by these models, enabling us to evaluate them: (a) in relation to the crowding models currently in use in Australia, and (b) with regard to their application to household crowding in Australian Aboriginal communities.

The case studies are selected with the objective of discovering key concepts and theories involved in constructing a model of household crowding applicable to Aboriginal communities in general, while acknowledging the cultural specificities of the various settings where Aboriginal people live, whether they be remote, rural urban or metropolitan. The result of this review of the literature will be a considered critique of

both Australian and international crowding models and the key concepts which must be investigated through field research in Aboriginal communities.

Although there are many passing references and comments in the literature to Aboriginal household crowding (e.g. see references in Long et al. 2007, p.15, p.16, pp.39–42), there has been no recent systematic attempt to critically examine these dispersed observations and findings in order to integrate them into a synthesised model of crowding which also draws on established social science models of crowding used for different cultures (e.g. the Chinese).

One of the crucial deficiencies in the existing research base on Australian Aboriginal household crowding is that although it was easy to source statistical analysis of 'overcrowding', and despite the Australian Institute of Health and Welfare's (AIHW) acknowledgement that perceptions of crowding are subject to 'cultural norms', there were no significant studies of Indigenous perceptions of crowding. Such perceptions should be considered an essential sub-theme of crowding research. Until the necessary empirical perceptual studies are carried out, the distinction between 'crowding' and occupation density remains methodologically flawed. It is among the purposes of this research to introduce and to maintain the distinction between crowding and occupation density as a matter of consistency, logic, and the proper recognition of the function of culture in the development of a crowding model.

It should also be noted that we employ the term 'crowding' throughout this Positioning Paper in preference to 'overcrowding', despite the prevalence of the latter in the Australian policy literature; this is in line with international social science usage and avoids the inherent tautology of the concept 'overcrowding'.

The ultimate focus of the current AHURI study is that of Aboriginal communities in urban settings, that is, the capital cities and the large towns which function as regional centres.[1] However, in the context of this Positioning Paper, we include existing studies of remote and very remote Aboriginal communities, together with those from urban centres, partly because of the paucity of previous studies on this topic, but also in order to demonstrate that the development of Aboriginal understandings of crowding are part of the deep structures of Aboriginal cultures across both remote and non-remote settings (after Sutton 2003).

1.1 Aims

This AHURI project aims to build a model of Australian Aboriginal house crowding, then test and refine it empirically for urban and metropolitan areas, generating useful findings for housing policy. The research commences in this Positioning Paper by critically examining existing models of household crowding reported in the literature nationally and internationally.

Our research aim is to build an Aboriginal model of crowding, initially based on literature analysis, and then to test its veracity and application to Aboriginal crowding in non-remote settings, and in so doing uncover salient dimensions and properties of Aboriginal crowding. Fieldwork will occur in selected capital cities and regional cities,

1 According to our definition, regional centres include cities such as Mt Isa, Alice Springs, Tennant Creek, Broome and Kalgoorlie. These cities may be located within 'remote' and 'very remote' areas as defined by the 'Accessibility/Remoteness Index of Australia' or ARIA index (ABS 2001). Other regional centre cities such as Cairns and Rockhampton may be located in the 'Outer Regional' and 'Inner Regional' areas of the ARIA index. The ARIA index is thus not a guide to our methodological approach of selecting study locations in which to carry out our field analysis. When we use the term 'non-remote' centre or 'urban' centre we mean cities, and when we contrast such cities with 'remote' Aboriginal settlements (populations less than 5,000), we gloss the 'remote' and 'very remote' categories of ARIA together.

and across public rental, private rental and home-owner households to see how different tenures impact on distinctly Aboriginal rule-governed behaviours and coping mechanisms. These findings seek to inform refined definitions of Aboriginal crowding for policy applications across all Australian jurisdictions as well as to have relevance for other international jurisdictions with substantial Indigenous populations (e.g. Canada and New Zealand). The research findings will also have implications for government policies on Indigenous health, housing procurement, housing management, town planning and appropriate house design. We aim to provide policy-makers with ways to understand, predict, measure, assess and manage Aboriginal household crowding.

1.2 Methods

This research project has two stages. The first stage is a literature analysis which is reported in this Positioning Paper. The second stage involves empirical research which will take place in mid- and late 2011, resulting in the Final Report and Policy Bulletin for AHURI.

1.2.1 Stage 1: Literature analysis and team workshop on Aboriginal crowding

In this Positioning Paper, we examine social science definitions and models of cross-cultural crowding, particularly those grounded in environmental psychology and social anthropology theory. A review will also occur of the recent, pervasive density-based standards of crowding used widely by government policy-makers, such as the Canadian National Occupancy Standard. In contrast we analyse the social sciences models which emphasise the perceived loss of personal control as a prerequisite of crowding and hold that the cause of such loss may vary cross-culturally (such as perceived stressful density), as will behavioural norms and rules for minimising such stress. Models also differentiate between room crowding, house crowding and neighbourhood crowding.

The Australian social anthropology literature on crowding is strongest regarding remote Aboriginal settlement settings, and our preliminary model as developed in this Positioning Paper does have an inevitable bias in this regard, but one that is unavoidable due to the relative lack of research in urban settings (although see most recently Birdsall-Jones & Corunna et al. 2010). Empirical research in Stage 2, based in urban towns and cities, will aim to redress this bias in our findings. The literature analysis also draws on the unpublished findings and reflections of the two senior researchers, Memmott and Birdsall-Jones, on Indigenous crowding, based on extensive lifelong field experiences in Aboriginal Australia, as well as on the personal experiences of our two Aboriginal researchers, Go-Sam and Corunna, who have grown up in Aboriginal households in north-east Queensland and south Western Australia respectively.

Corollary and complementary models which are also discussed here and based on literature analysis, as secondary theoretical tools, are those of Aboriginal ‘privacy’ as a coping mechanism for crowding (a type of converse construct of crowding), Aboriginal household types and transformations, socio-spatial residence patterns and rule-governed behavioural settings in the house.

The development of the preliminary crowding model involved a workshop held at the University of Queensland which was attended by the two Perth members of the team (Christina Birdsall-Jones & Vanessa Corunna), as well as two invited social scientists to assist in the construction and critique of the model: Professor Andrew Jones, Director of the Queensland AHURI office and Professor Mark Western, Director of the Institute for Social Science Research.

1.2.2 Stage 2: Empirical data collection and model revision on urban Aboriginal crowding

The Stage 2 research will use the literature-based model of Aboriginal crowding developed within this paper and test it for non-remote urban settings (ABS 2001), firstly to refine the application of the model for use in metropolitan and urban settings and secondly to address the prescribed research questions for this study as outlined below.

- What are the dimensions of crowding in Indigenous households?
- How does this vary by tenure, dwelling type and geography?
- What are the various drivers of crowding?
- How do the drivers interact with housing variables?
- How does crowding impact upon individuals and households?
- At what point does crowding have negative consequences?
- What strategies do Indigenous households employ to cope with crowding?
- What are the policy and program implications of crowding for housing providers?
- Are there design opportunities to build housing that can accommodate the high rate of mobility and visiting patterns of Indigenous people while maintaining high standards of living for permanent residents?

Four urban study sites will be used during Stage 2 to ensure a reasonable (although not necessarily equal) sample of householders across public housing rental, private rental and home-owner categories. We aim for a total of 70 to 80 householder interviews distributed across the four sites (average of 19 or 20 households per site). Where possible, some variation of house type will also be sought in the study, for example detached dwelling, town house, flats. Two suburbs within metropolitan centres have been chosen for this study: Inala in Brisbane and Swan/Stirling in Perth; each has a high Indigenous residency. In addition, the two regional centres of Broome and Mt Isa have been selected as case study sites, both of which have high Indigenous residency rates and attract visitors or residents from a regional catchment of remote communities that are characterised as having strong traditions of residential behaviours. Cultural factors contributing to crowding will be explored including mobility and migration patterns. A principal finding will be Aboriginal understandings and constructs of what constitutes crowding. These findings will be built into a model of Aboriginal crowding. The main data collection technique to ensure cross-site comparative analysis will be structured interviewing in conjunction with a survey instrument.

1.3 Various models of crowding

Models of crowding have developed systematically and internationally, especially in the environmental psychology literature, over the last four decades. However, the available cross-cultural research on the subject is largely restricted to studies of North American, European and East Asian peoples. A key aim of the current study is to see how useful such existing models may be in understanding what an Aboriginal construct, or indeed constructs, of crowding might be. Crowding is no longer conceptualised by researchers as simply stress and annoyance, which consistently arise in response to high-density situations. Such a basic stimulus-response model is unable to incorporate a certain number of experiences of crowding, nor is it able to explain why people in some high-density situations do not experience crowding in a

stressful way. The often-cited examples of the latter include enjoying a party or a sporting event (Proshansky et al. 1970; Stokols 1972, 1976).

We draw liberally on a very comprehensive literature review of crowding carried out by environmental psychologist Robert Gifford (2007), which is 40 pages long and cites some 288 references (most written in the post-1990 period, but some as early as 1903), as well as drawing on selected references on which he bases his analysis. The majority of Gifford's references are from within the psychology discipline, especially environmental psychology, but also from social psychology, behaviour and perception, cognition, personality, child development and the ethology sub-disciplines. There is also a drawing of journal papers from other disciplines, particularly sociology, architecture and design studies, anthropology and cultural studies, criminal justice and prison studies, medicine and health studies and leisure studies; with a few papers taken from each of demography and population studies, economics, traffic studies, education and law. We also utilise an earlier review of the Australian Indigenous crowding literature by Memmott (1991) and a recent audit of the Aboriginal housing literature by Long et al. (2007).

1.4 The density model

Crowding and high density are not one and the same thing and are not always strongly correlated with one another. According to Gifford, 'Crowding is a subjective experience that is only mildly related to the physical index of high density' (2007, p.220). Despite this, the density model of crowding has been internationally popular as a relatively simple method of determining the capacity of rooms, houses, multi-residential buildings and neighbourhoods over many decades, both with researchers and government housing bodies (see Table 1). Recent research indicates that while density can have an effect on stress levels of occupants, there is no simple correlation between density and perceptions of crowding. While some authors continue to argue that high density living is stressful, even when crowding is not perceived (Evans et al. 2000, p.207), the majority of authors tend to relate the complexity of crowding as both psychologically and culturally determined (Gifford 2007). Nevertheless, government agencies commonly utilise density models to evaluate whether architectural settings are crowded. The density rules that are employed tend to be derived from British or European norms of spatial behaviour and room use.

Table 1: Some governmental definitions of crowding and how they are derived and utilised

National Government	Institution	Crowding definition
Australia	Australian Bureau of Statistics (ABS 1975) Family Survey (ABS 1980) Anderton and Lloyd (1991)	Density derived
Australia	Department of Housing and Construction (1984)	Density derived
Australia	NHS Housing and Locational Choice Survey (National Housing Survey 1992)	Density derived
Canada; also used in Australia by ABS for Census and NATSISS	Canadian Mortgage and Housing Corporation (1991)	National Occupancy Standard (NOS); density derived
USA; also used as one of several indicators in New Zealand	United States Census Bureau	American Crowding Index (ACI); density derived
Australia	Australian Institute of Health and Welfare (AIHW 2005)	Proxy Occupancy Standard (POS); density derived
New Zealand; used as one of several indicators in New Zealand	Statistics New Zealand (2003)	Equivalised Crowding Index (ECI); density derived

Source: adapted from Jones 1994, p.7

In Australia, the density model of determining crowding using the Canadian National Occupancy Standard (CNOS) is currently utilised, which employs bedroom density to determine the residential capacity of a house. The National Aboriginal and Torres Strait Islander Social Survey (NATSISS) also utilises the CNOS, despite the impact of known Indigenous factors such as high residential mobility, cultural obligations to accommodate kin and other visitors, avoidance behaviours which determine suitability of particular sleeping and other living arrangements based on complex kin and shame relationships, and preference for outdoor living among some groups, which are factors further outlined in our later case studies. The basis of the CNOS is that gender and age determine who can share a bedroom and these have a basis not in Indigenous cultures but appear to be derived from Anglo norms of privacy and individuality.

Table 2: Bedroom-sharing criteria from the Canadian National Occupancy Standard (CNOS) (1991)

Canadian National Occupancy Standard Criteria	Bedroom requirements
General	No more than two people per bedroom.
Gender and age	Children aged under five, of the **same** or **different genders**, can share a bedroom. Children aged over five and under 18, of the **same gender**, can share a bedroom. Children aged over five, of **different genders**, should not share a bedroom.
Relationship status and age	**Couples** and their **children** should not share a bedroom. A household of one **unattached** individual may occupy a bed-sit. **Single** household members, aged over 18, should have their own bedroom.

The CNOS rules summarised in the above table dictate that children over the age of five of different genders should not share a bedroom. Many authors cite the CNOS as widely used, but it is rarely questioned in terms of validity. Presumably these standards are designed to reflect internationally valid, Anglo-Australian community standards of decency, privacy and gender separation, yet in the case of one Anglo author of this paper (K.G.) this was not the parenting approach taken by her or many known associates. The author's children aged over five, of different genders, shared a bedroom until the boy was aged ten and the girl aged seven. This caused neither distress to the children nor raised eyebrows among family or friends. The generous proportions of the bedroom, the children's own desires to share the space as close friends and the non-availability of additional bedrooms positioned it as a normal and accepted bedroom occupancy type. We argue that these presumed standards are not reflective of community norms in many cultures including that of the contemporary Anglo-Australia.

The architectural design theorist, Christopher Alexander, argues that the arrangement of a 'bed cluster' in which children sleep in proximity to each other and their parents, but with due regard to privacy (1977, p.318) demonstrates that even in Western cultures, discrete bedrooms related to individuals are not the only solution to privacy issues.

1.4.1 Culturally-specific responses to density and perceptions of crowding

Density is a measure of the number of individuals per unit area, whereas crowding according to Gifford:

> … refers to the person's experience of the number of other people around. Rather than a physical ratio, crowding is a personally defined, subjective feeling that too many others are around. Crowding may correspond to high density, but often the connection is not as strong as one might think … Crowding is a function of many personal, situational, and cultural factors. (Gifford 2007, p.192)

This definition emphasises the culturally-specific nature of crowding perception, also acknowledged by Gillis et al. (1986), and Chan (1999) and others. Chan finds in his Hong Kong study of housing that crowding is only weakly correlated with actual space available and is more related to subjective factors such as overall satisfactions with

the dwelling (2000, p.116). While Evans et al. (2000) acknowledge that *perceptions* are culturally specific, they argue that the *effects* of high density on psychological health, act regardless of crowding being perceived or not. What is clear is that neither density nor crowding are easy to measure or simple concepts to grasp, with physical environmental phenomena such as sensory stimuli, housing size, housing design type, internal house density and density within the building or neighbourhood interacting with subjective mechanisms such as coping strategies, cultural preferences, and notions of privacy, to create a perception that crowding either exists or does not exist.

The determination of what constitutes a 'high-density' situation for a particular group is thus a subjective perception that is dictated by the group's implicit norms about the matter and its recognition of the potential 'crowding' effects of such a state (Rapoport 1976, p.23). In this analysis we use the term 'perceived high density' to distinguish it from actual physical density as measured by the number of people per unit area.

1.4.2 Measuring density

Density (i.e. physical density) is often used in relation to houses and might be measured by the number of people per room, per sleeping area, or per house. Methodologically, it would be desirable if such measures included the actual area of room or house size in square metres, although many crowding studies and observations fail to do this. Density is also used in relation to dwellings within a multi-dwelling building (called 'design density' by Gillis et al. 1986), neighbourhoods, suburbs, or small towns, and in these contexts is usually measured by the numbers of dwellings or numbers of people per residential hectare or acre (Memmott 1991, p.255). Although Gifford (2007, p.192) has summarised research noting the important distinction between indoor and outdoor density, overwhelmingly studies of crowding have focused on indoor density; that is, within each house based on people per bedroom (e.g. CNOS). Another type of infrastructure density measurement in housing and public spaces is the number of residents per available toilet and the number of residents per available bathroom (Wigley 2008).

A set of longitudinal household function survey data on Indigenous housing has been embedded in the recurring editions of the National Indigenous Housing Guide (NIHG) (see most recently FaHCSIA 2007). Based on these data, the NIHG critiques the application of simplistic density measurement, and warns against the highly misleading use of density calculations derived from dividing total population by house numbers to produce average household occupancy numbers (FaHCSIA 2007, p.137). Through the use of a hypothetical illustrative example, based on research in a typical remote community, the NIHG includes the impact of intra-settlement and inter-settlement movement into the equation, indicating the level of data input required to produce a much more accurate measure of density. The illustration focuses on a north-Australian remote community of 300 people having a total of 50 houses, with an average of six persons per house. This simple density figure is then adjusted by distinguishing between houses with functioning and non-functioning hardware. When a household's hardware ceases to operate (toilet, shower, stove, sink, etc.), the household moves to stay with relatives in another house, even though they may remain registered as the tenants of their old home.

Thus by excluding non-functioning houses from the calculation, not surprisingly, the resulting average house density for the community dramatically increases from six to 12 people per house. This average was then further adjusted to include occurrences where houses would be operating over and above already existing high household density, due to weather events (wet season) and sporting activities (football games). The conclusion was that household occupancy at these peak periods can double or treble above the adjusted house density of 12 people per house to 24–36 people per

house (FaHCSIA 2007, p.137). Further variables noted elsewhere contributing to household density are: (a) natural population increases, (b) death protocols which also result in dynamic household responses, and (c) house yard development which facilitates visitor yard camping (Pholeros 2010, p.11).

The security of having optional settings into which to retreat from a higher density setting is an important mechanism for many societies in coping with potential crowding stress (e.g. see Draper 1973; Schmidt 1983). This last mechanism has been explored by Altman (1978), Baldassare (1979), and Loo and Ong (1984, p.74, p.75). An emergent hypothesis is that high neighbourhood densities may be tolerated and even enjoyed and valued where they are the domain of transitory market relations, provided at the same time there co-exists the security of possible retreat to individual residences, characterised by intimate, structured family relations in which crowding stress is not perceived. The public and private domains must therefore be conceptually separated in the analysis of neighbourhood crowding. (Memmott 1991, p.256)

1.5 The stress model

1.5.1 Loss of personal control and stress in modelling crowding experience

In the revised constructs of crowding, developed in the 1970s and 1980s (e.g. Stokols 1972; Esser 1973; Altman 1975; Schmidt 1983; Gillis et al. 1986) and refined further in the 1990s, crowding is defined as a state in which one experiences a perceived loss of personal control over the environment, arising from certain circumstances of a high-density context. In reality, individuals may use the word 'crowded' to describe any high-density situation, but according to the definition adopted above, 'crowded' implies a perception and it is terminologically important in analysis not to classify a high-density situation as being 'crowded' until it is established that some of its participants perceive themselves as being crowded, or at least perceive stress or annoyance (Stokols 1972, pp.72–83, Esser 1973, p.207, Altman 1975, p.159). However, it should be noted that the need for such recognition is disputed by one group of researchers, Evans et al. (2000), as previously discussed, claim that density effects can be present but not perceived, such that a state of crowding with concomitant stress can be present, albeit undetected by the occupants (2000, p.208). Nevertheless, we align with the majority of environmental psychologists to conceptualise crowding as an interpretive, motivational state of which individuals are, for the most part, usually aware. As Chan argues:

> Firstly crowding is a personal, subjective reaction, not a physical variable; secondly, it is a motivational state that often results in goal-oriented behaviour with which to alleviate discomfort; thirdly it centres on the feeling of having or controlling too little space. (Chan 1999, pp.105-6)

It is important to note that cultural factors also influence the perception of the converse psychological state of ‘isolation’, where desired social contact fails to be achieved (Gillis et al. 1986, p.685).

1.5.2 Loss of personal control

‘Personal control’ is a variable of crowding models in the social sciences, and is a multi-dimensional behavioural concept. It may include a range of meanings and notions, including the individual's ability to control the occurrence of certain social experiences, to maintain goals, to fulfil expectations, to obtain valued outputs from situations despite annoying surroundings, or to be satisfied that the predictability of social and environmental conditions is not threatened. Density becomes annoying or stressful when it threatens, removes or reduces personal control and consequently

the outcome of desired types of behaviours (Baron & Rodin 1978; Insel & Lindgren 1978, p.21; Schmidt & Keating 1979; Schmidt 1983).

The environmental psychologist Gifford, expands on the nature of personal control as follows:

> Personal control is an important component of crowding. A key aspect of this is locus of control, the tendency of individuals to believe (or not) that they exercise considerable influence over their own lives. Individuals who believe this more (internals) generally have been found able to handle the stress of crowding better than those who believe it less (externals), although not every study supports this conclusion. (Gifford 2007, p.195)

1.5.3 Variable experiences of stress

The general result of experiencing crowding is personal or group stress. As implied above, dense settings are not necessarily in themselves stressful, but they have been shown to possess a large range of properties, any one or combination of which may result in stress for setting participants. Such properties of these settings include a perceived high density of people, confining architectural elements and other physical barriers that may obstruct desired behaviour, and excessive noise levels or other forms of sensory stimuli. The resulting information overload can relate to factors such as noise from multiple sources, unwanted people staring or observing one another, proximate arguments or fights, proximate sickness, unsanitary pollution and smells, constant jostling and pushing, people being uncomfortably close, too many strangers or unfriendly people, high frequency of crime, and a lack of alternate settings into which to retreat (Loo & Ong 1984; Six et al. 1983). Rapoport (1976, pp.12–14) has derived a classification system of such properties characteristic of 'crowded' settings or 'perceived high density' settings. It has been shown that even an individual residing in a dwelling on their own in an urban environment may experience crowding (Loo & Ong 1984).

The length of exposure to the setting and its stimuli, is another important variable in the experience of crowding (Zeedyk-Ryan & Smith 1983). As time proceeds a setting participant may attempt different forms of adaption and coping mechanisms, which have to be regularly evaluated in response to ongoing and possibly changing setting stimuli and perceived stress levels (see Altman 1978, p.15). Evans et al. note that one reason why perceptions of crowding differ between cultures may be that the psychological effects of high density may take up to six months to have an impact on occupants (2000, p.210).

Gifford has summarised the evidence on the types of stress arising from prolonged high indoor density including impairments of mental and physical health, task performance, child development, and social interaction (Gifford 2007, p.220). Gifford writes:

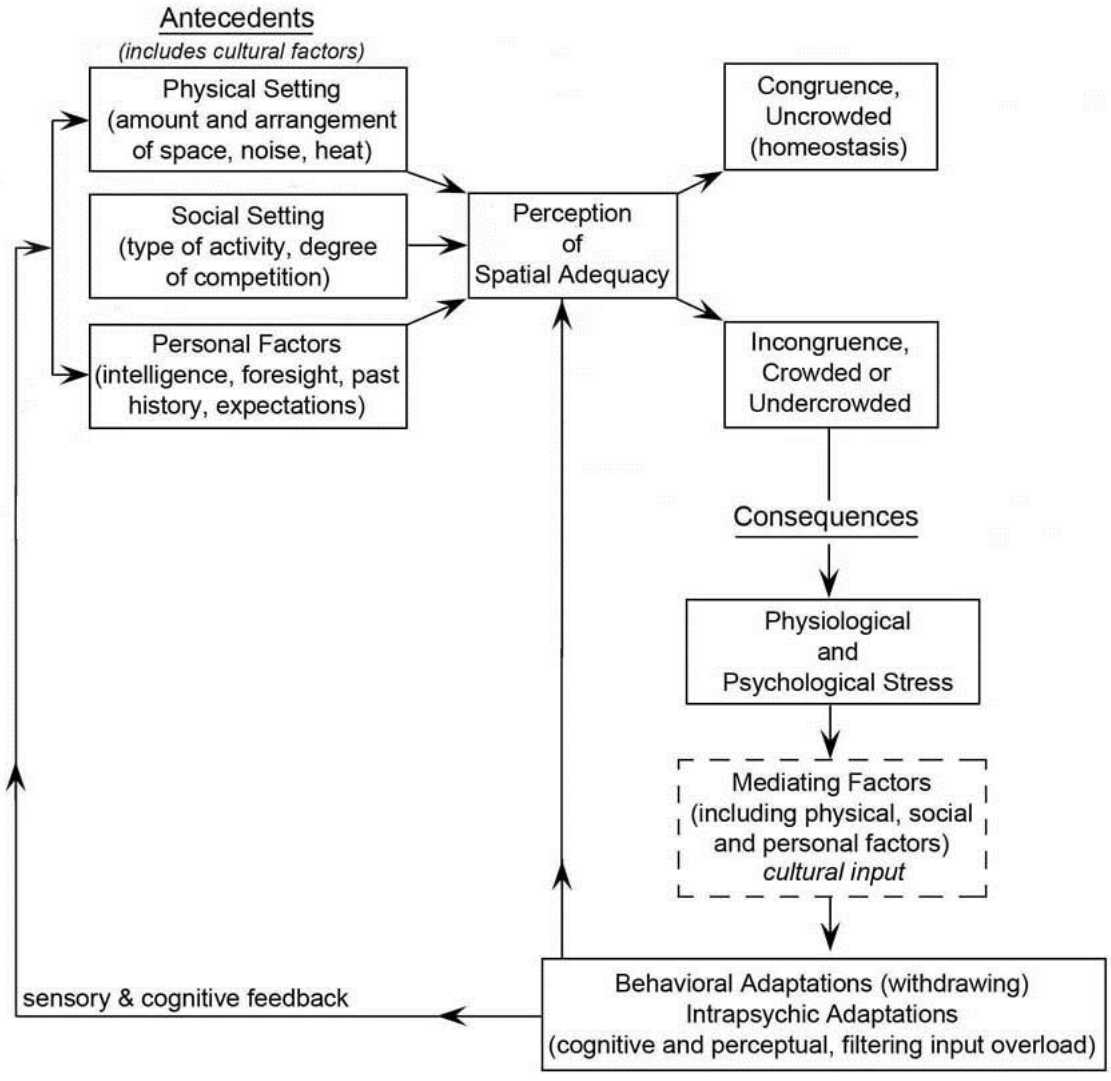
> High indoor density usually leads to physiological and psychological stress, at least for those who prefer larger interpersonal distances or are socially isolated. Both low density (living alone) and high density (when combined with social hassles and a lack of social support) increase the risk of mental disorders. High density at all scales from room to region appears to increase alcohol consumption. It also seems to harm the physical and psychological development of children and expose them to more abuse and neglect. (2007, p.213)

1.5.4 Gifford's integrative theory of crowding and its cultural components

In his comprehensive review of crowding theories, Gifford attempts to synthesise the various dominant paradigms of crowding into a single integrative theory of crowding which he summarises as follows:

> Certain personal, social, and physical antecedents lead to the experience of crowding. Among these are a variety of individual differences, resource shortages (behavior-setting theory), the number of other people nearby (density-intensity and social physics theories), who those others are, and what they are doing. Sensory overload and a lack of personal control are psychological processes central to the experience of crowding. The consequences of crowding include physiological, behavioural, and cognitive effects, including health problems, learned helplessness, and reactance. (Gifford 2007, p.217)

Figure 1: An integrative model of crowding



Source: adapted from Gifford 2007, p.195, p.214, Fig.7, Fig.12

We have adapted Gifford's diagrammatic theoretical model to crowding as above (Figure 1), to include the salient cultural factors in his discussion. We note that Gifford incorporates culture into his crowding model in two places:

1. Cultural factors are implicit as part of the antecedent factors (e.g. physical and social settings character, past personal and group history).
2. Cultural factors are also implicit as part of the mediating factors shaping response to stress.

With respect to antecedent factors, it is argued that in different cultures, childhood conditioning and socialisation processes equip individuals to adapt to, and to deal with density in different ways, according to different norms, in perceived high-density situations. Thus Rapoport (1976, p.18) and others have argued that being with like people will decrease stress frequency in potentially crowded circumstances. Kinship groups (e.g. extended families, multiple family units) and other culturally homogenous groups are most likely to be socially well-structured. (Memmott 1991, p.257)

Similarly, those individuals within the same culture will have common methods to mediate situations that are perceived to be stressful and crowded, and to maintain group sanctions over what is appropriate stress-avoidance behaviour. Of the propensity for cultural factors to act as mediating or moderating influences, Gifford writes:

> The consequences of crowding and high density depend in part on cultural background. Culture acts as a moderating influence on high density, sometimes providing its members with a shield against the negative effects of high density and sometimes failing to equip them with effective means of coping with high density. (2007, p.21)

1.5.5 Coping mechanisms to minimise crowding stress

The cross-cultural literature on crowding, although modest in its extent, notes diverse responses to density in cross-cultural contexts (Hall 1966; Draper 1973; Rapoport 1976; Schmidt 1983; Gillis et al. 1986). For some groups (e.g. the !Kung Bushmen), there appears to be higher tolerance of dense settings, and some argue that this is more the case in what Edward T. Hall (1966) describes as ‘contact’ and ‘collectivitist’ cultures (Evans et al. 2000, pp.204–5). However Loo and Ong (1984) warn that dense settings enclosed by wider urban areas may not exist through the self-adjusted spacing of the residents, but may be the result of racial and economic determinants.

It has also been argued (Schmidt 1983; Gillis et al. 1986) that tolerance of high-density settings is achieved by different cultural groups through the development of different psychological and social mechanisms for evaluating and maintaining personal control over such high-density situations. For example there might exist different norms concerning the ownership and use of space, and the appropriate social distances for various types of social interactions. These may involve different social roles and structures. Some societies are notably more gregarious and place value on being sociable, and may discourage the isolation of individuals; while others might place value on opportunities for solitude (Anderson 1972; Gillis et al. 1986; Memmott 1991, p.256).

A holistic understanding of the nature and extent of crowding stress needs to take into account the mix of settings that an individual experiences in their day-to-day life at different environmental scales, including those of the bedroom, the home, the street and the neighbourhood. Thus Gifford writes:

> Short-term high density may have positive outcomes when social and physical conditions are positive; high outdoor density, as in large cities, certainly can provide an enjoyable variety of social and cultural experiences. (2007, p.220)

In his study of a number of Asian groups in multiple-family residences, Anderson (1972) has elicited various domestic methods, rules and principles that effectively manage, structure, and coordinate a household's activities in space and time to minimise crowding stress. These mechanisms include private storage areas for individual family food and utensils, private family stoves, privacy of family bedrooms, visual avoidance of bedroom door openings, the separation in time of food preparation (kitchen use) and food consumption, strongly developed household social structures with notions of status and respect, severe disciplining of children to punish them for household disruption, shared disciplining of children to reduce inter-family conflict, sanctions on emotional behaviour between unrelated individuals, and public procedures for expressing and resolving grievances. More recently Chan (1999) also discussed Asian cultural norms, in this case in Hong Kong, inherent in which are strategies for coping with high-density living, such as sharing of emotional states with family members, high levels of behavioural flexibility and low levels of privacy required in terms of personal space (1999, p.119).

1.5.6 The construct of privacy as the converse of crowding

We should note there that the word 'privacy' represents another complex construct that qualitatively appears to be the opposite of crowding.[2] It pertains to a category of coping mechanisms used in response to crowded situations:

> [Privacy] is a need, unrecognised by many, that most of us have … [w]hether achieved through solitude, intimacy, or anonymity, it can serve to unwind us from tense states or to provide a release from too many interactions and distractions. (Insel & Lindgren 1978, p.14)

Altman (1975, p.18, pp.53–4) has defined privacy as the selective control of access to one's self or to one's group. It can be seen here how the notion of maintaining control is the opposite of what characterises a situation of crowding (Insel & Lindgren 1978, p.28). Privacy is no longer conceptualised by researchers as an individually-oriented phenomenon, but rather as a dynamic interaction between several individuals or groups with rights of control as well as rights of access by others, and McBride (1977) argues further, that these mechanisms are in a form of equilibrium with one another (Memmott 1991, p.257).

Strategies for coping with crowding may involve different types of mechanisms for maintaining personal control, and seem to be more elaborated in some cultures than in others. It is when these types of mechanisms fail to operate, or are not available, that high-density environments become stressful. The assessment of what constitutes crowding can thus involve very culturally-specific values, concepts and rules.

Mechanisms to achieve privacy include maintenance of personal space or group territory, personalisation of objects and environments, reinforcement of territorial definition through architecture and landscaping, and maintenance of other types of space-time boundaries. Altman (1975, p.50) argues that the behaviour of withdrawal facilitates the development, reinforcement and self-assessment of self-identity and self-understanding. However it should be noted that the concept of ‘self’ varies cross-culturally (Mauss 1979; Myers 1986, Ch 4) and Altman’s assertion may not be cross-culturally applicable in all instances. Further investigation of this is required, especially among those ‘contact’ and ‘collectivist’ cultures described by Hall, which include Australian Aboriginal groups.

[2] It should be noted that crowding is an English word for which there is not a lexical equivalent in most other European languages (Insel and Lindgren 1978, p.8). To the best of the authors’ knowledge it does not occur in any Aboriginal language either. Likewise we note that there is no equivalent lexical term for 'privacy' in many languages.

Chan (2000, p.107) notes that concepts of privacy are complex. He argues that in Western studies four different concepts of privacy are prevalent: solitude, intimacy, anonymity and reserve; whereas in studies of Chinese populations, the privacy concepts desired by most people also include solitude and reserve, but in addition, disclosural privacy, escape and domestic privacy. Disclosural privacy relates to keeping one's affairs and information private from government (Westin 1970; Traver 1984 cited in Chan 1999, pp.107–8).

1.5.7 Summary of models of crowding

Our literature analysis reveals that states of crowding are characterised by the perception of high density, displaying various stimuli, some of which induce stress in occupants. The determinations of whether these stimuli are stressful or not, varies according to one's values of the environmental acceptability or non-acceptability of these stimuli. The experience of crowding is also 'accentuated by personal factors (personality, expectations, attitudes, gender), social factors (the number, type, and actions of others, the degree of attitude similarity), and physical factors (architectural features and spatial arrangements)' (Gifford 2007, p.220). The result may be perceived as loss of personal control and/or social and informational overload (comprising a perceptual/cognitive component of the crowding model). Alternatively In response to such a situation, a coping mechanism may be utilised if one is available (a reactive behavioural component to the model). The values that are employed to evaluate the setting state (its stimuli), and to select an appropriate coping or mediating mechanism, and the nature of such mechanisms, may vary cross-culturally.

A last observation by van Staden stresses the dynamics of the two-way interaction system between people and their environment:

> Based upon these parameters, the conceptualization of crowding appears to be developing towards a description of the experience of crowding as a transactional process involving multiplicative interactions between the individual and the sociophysical situation in which he/she is immersed. As such, the experience of crowding cannot be properly regarded as residing within either the individual or the sociophysical situation, but must be understood as the transactive consequence of a person's attempts to operate within and across different socio-physical contexts. (1984, p.22)

This finding is in keeping with Gifford's integrative model which incorporates constant feedback loops between the remembered experience of crowding (antecedant factors), the current perceived experience of spatial adequacy, any currently perceived stress and the effectiveness of the behavioural adaptations being utilised to cope with the crowding experiences (see Figure 1).

2 SUMMARY OF REFERENCES TO ABORIGINAL CROWDING

A set of key references on crowding issues in Aboriginal housing have been identified from our literature search that provide useful observations to inform crowding analysis, although none of which constitute a systematic study of the phenomenon of crowding in their own right. Data from these sources will be used to develop and elaborate the later crowding model for Aboriginal contexts. At the time of writing there were only ten studies of varying depth in the literature, which examined crowding and privacy among Aboriginal people using the type of theoretical orientation outlined in the preceding model. All ten contain valuable insights into Aboriginal perception of crowding, but none of them attempt to integrate these cross-cultural findings into a composite model.

The studies are:

1. An analysis in the mid-1970s of four settlements in central northern Arnhem Land (Maningrida, Ramangining, Milingimbi, Nangalala) by Reser (1976, pp.24–6; 1979, pp.65–96) and supplemented by Fantin's more recent research at Galiwin'ku and Ramangining on customary avoidance behaviour in housing (Fantin 2003a,b).
2. A study by Memmott (1979, pp.366–70) on Mornington Island Mission in north Queensland, also carried out in the mid-1970s.
3. The work of Memmott in Wilcannia (1991, p.258).
4. The work of Ross (1987, pp.112–23) on crowding in camps and reserves at Halls Creek, in the Kimberley region Western Australia during the early 1980s.
5. A study of daily life and intra-settlement mobility at Yuendumu that focuses on a women's household (or *jilimi*) by Musharbash (2008, 2003).
6. Studies carried out by Birdsall-Jones and Corunna at Perth, Carnarvon and Broome (Birdsall-Jones 1990; Birdsall-Jones & Corunna 2008; Birdsall-Jones & Corunna et al. 2010).

Each of these studies will be briefly summarised in this section to provide the context for each piece for research and to outline its overall contribution. An analysis will later follow which draws together data from this literature in terms of the two main components of the model: perceived stress-inducing stimuli and coping mechanisms for crowding.

2.1 Arnhem Land, NT Yolgnu Study

The environmental psychologist Reser (1979, pp.65–96) synthesised research on the Arnhem Land Reserve in the Northern Territory, about the notion of individual control over one's house, stemming from a complex of cultural and environmental variables. Reser argued that loss of control over one's domiciliary environment, household services and extended kin relations, can lead to stress with negative impacts on physical and mental health as well as the social and economic functioning of the household. It was found that in an environment where loss of control is experienced at a number of levels and aspects of daily life, an accumulative stress effect results, aligning with the more recent international literature stating that an accumulation of high-density stress over months is required before effects are noticed (Evans et al. 2000, p.210). In remote areas, lack of access to regular maintenance to ensure operation of key household functions was described as a further cause of perceived lack of control. These key findings also flagged implications for housing management still relevant today.

Shaneen Fantin (2003a, b) explored avoidance in some detail at Galiwin'ku and Ramingining in north-east Arnhem Land and its manifestation in housing, specifically between sons-in-law and their mothers-in-law and between adult brothers and sisters. Implications or impacts of avoidance behaviour on crowding are not raised in Fantin's study, however, her research does identify that avoidance regulates sleeping behaviour and as well as diurnal socio-spatial arrangements, and if such outcomes are not achieved or compromised this may at times contribute to crowding (Fantin 2003b, p.74).

2.2 Mornington Island, Qld, Lardil Study

Comparing Lardil domiciliary behaviour in a state of cultural and settlement change at Mornington Island in the mid-1970s, Memmott (1979) made a number of detailed observations about behavioural patterns operating in the two major domiciliary spatial divisions of the 'village' and the 'ridge'. The 'village' originated from a traditional camp and was a largely self-constructed, high-density settlement that had a long history pre-dating 1914 (when the first missionaries arrived) as a customary trading camp, located on a vegetated sand platform; whereas the 'ridge' was a planned street on a higher ridge location with land lots accommodating 19 prefabricated government houses constructed in the early 1970s. This research demonstrated continuity of traditional domiciliary patterns adapted around government housing, countering academic and policy discussion in the mid-late 1970s that Aboriginal people were unable to adaptively respond to Western modes of settlement planning (Memmott 1979, p.337, pp.359–62).

Based on observations of violence between individuals of both the same and different language group origins, and between both neighbours and individuals residing in proximity to one another, Memmott (1979, pp.363–4) concluded that the socio-spatial groupings within the residential neighbourhood in some cases supported conflict or in other instances, helped avoid it. For example, occupants of proximate residential groups were readily available to support one of their members in a fight, if it occurred in the vicinity of the domiciliary space(s) of the group. Consolidated kin groups ranging between two to seven related nuclear families living in close proximity, presented formidable opposition to any neighbours or outside individuals considering engaging in a fight. Residential shifts (either temporarily or permanently) were a common strategy to avoid further (or escalating) conflict. A vulnerable person might either move to the household of a relative within the same consolidated kin group or to that of a relative in a socio-spatial grouping of different language group affiliation.

Importantly, the new 'ridge' houses planned and constructed according to Western norms affected change in residential density and sleeping behaviour when people moved up from the 'village'. The 'village' domiciles had an average occupant density of 4.3 and this was less than the 'ridge' house types of 6.8. These calculations were based on floor area comparisons between the village and the ridge houses, but also included both of the two 'ridge' house sub-types ranging between 60 and 64 square metres. In the 'ridge' houses, rooms utilised for sleeping included bedrooms and living room. Calculations according to the housing standards[3] at the time, considered the ridge houses overcrowded. This assessment contrasted with those of the occupants of the 'village' where a perception of crowding was not noted (Memmott 1979, pp.363–70, Table 17).

[3] Generous by the widely utilised Canadian National Occupancy Standard (1991), Memmott (1979) referred to King's standards (1974, p.46) of three people requiring a minimum of three rooms, four people requiring a minimum of four rooms, seven people requiring a minimum of six rooms.

Although much physical change has occurred in the settlement between the mid-1970s and 2010, one of Memmott's doctoral students, Cameo Dalley (2010) has also found clustering of specific extended families or clans in rental housing precincts to be occurring informally as opportunities have arisen, combined with bush camping as a means of escaping household and neighbourhood crowding or family violence.

2.3 Wilcannia, NSW, Barkandji Study

In the 1980s, crowding was a consistent complaint raised in relation to what were called the 'Mission' houses in the rural town of Wilcannia. The Mission was an enclave of timber cottages on a small Aboriginal Reserve excised out of the town common. The remainder of the common was the site of a fringe camp known as 'The Mallee'. The spacing of the self-constructed iron shacks (also known as 'humpies'), of the fringe camps was much wider apart than the cottages in the Mission. As early as 1957, the anthropologist Beckett reported that crowding on the Mission was due to excessive noise and proximate quarrels and fights. Mission resident E.J. said (5/88) the problem was threefold: the houses were too close, the noise levels were too high, especially when there were late night drinking parties, and families were incorrectly allocated to houses by the Welfare Supervisor leading to unfriendly relations between some neighbours. This emphasises the importance of group and personal control over socio-spatial relations. Beckett concluded that one's residential location with respect to choice of neighbours, was a more important criterion in Aboriginal values than any aspect of the actual house design. Many people preferred to live in a humpy than be too close to neighbours whom they did not like (Memmott 1991, p.258).

Another source of stress reported in the Mission due to its high density and introverted settlement plan was that of patrolling police cars, whose occupants could too easily observe or hear any noisy occurrence, whether it be a drinking spree, a quarrel or a fight. This was in contrast with the Mallee which was far more spread out and in which one could observe and identify approaching vehicles and take appropriate courses of action to avoid arrest (p.c., J.B. 20/11/86)(Memmott 1991, p.258).

2.4 Halls Creek, Kimberley, WA Study

The environmental psychologist Helen Ross reported similar categories of stress perception for the Halls Creek town camp communities in Western Australia. One source of annoyance within households was uncontrollable disturbances due to noisy drinking and resultant fighting. A second aspect of household crowding was the financial strain of feeding visiting kinsmen. People were not that concerned by fairly high household density in itself. This situation was reinforced by the high value placed on sharing resources with kin, and the 'almost unthinkable breach of norms' (1987, p.114, p.115) that would result from a refusal to accommodate a kinsperson. Social disturbances and accompanying noise also resulted in perceived neighbourhood crowding at Halls Creek (as distinct from household crowding), which Ross reports as constituting a higher perceived stress source than that generated by either of the two forms of household crowding even though one (noisy disturbances) was synonymous in nature, although not in scale. (Ross 1987, p.114, p.115)

2.5 Yuendumu, NT, Warlpiri Study

Musharbash's (2003) doctoral study centres on key occupants of a single women's houses (or *jilimi*) located at the Inner West Camp in the central Australian desert community of Yuendumu and is a significant contribution to understanding their socially complex composition and nature. These findings were later developed into the book *Yuendumu Everyday*. *Contemporary life in remote Aboriginal Australia* (Musharbash 2008, p.61) revolving around *jilimi*-centric observations of daily life over

a period of 221 nights (although not in one continuous time period). Musharbash construed the Warlpiri or *yapa* day-to-day worldview as being founded on three behavioural values of mobility, immediacy and intimacy, Musharbash (2008, p.4, p.7, p.62) uses these case studies to more accurately describe everyday life and the finer nuances of inter-relatedness. More specifically, these values become clearly understood as drivers of everyday social practice by Warlpiri people in general and by the residents of the *jilimi* in particular (2008, p.8).

Commencing with the first value of mobility, a methodological distinction is made between the domestic space and the transforming social practices relating to the space, permitting in Musharbash's (2008, p.60) view, an examination of mobility as a valued and fluid process rather than as an incidental phenomenon that occasionally affects 'household' or 'residential group' composition.[4] Not only do Warlpiri people frequently change and hold multiple residences, but Musharbash found the analysis of this dynamic through cyclical activities such as sleeping arrangements, damper making, meal consumption or demand sharing, renders the static concept of 'household' relatively useless as an analytical tool (Musharbash 2008, p.60, pp.73–6, pp.115–23, pp.174–5).

While recognising that demand sharing occurred regularly among extended kin, related through descent and marriage links, Musharbash (2008, p.73) observed the practice to be most strongly exercised between those who have closely shared, sustained and continually affirmed life experiences. The *jilimi* residents thus fell naturally into four categories by such social closeness or distance: (a) core residents, (b) regular residents, (c) on-and-off residents and (d) sporadic residents. Core residents were individuals who slept at the *jilimi* between 133 and 221 nights during the study period, comprising of both adults (7) and children (4), a total of 11 individuals including Musharbash, who was a classificatory daughter of the senior core residents (2008, pp.62–5).

The second category, being 'regular' residents, totalled 12 individuals (nine adults and three children) who stayed at the *jimili* for between 44 and 76 nights. However the greater number of individuals from extended kin networks belonged to the categories of 'on-and-off' residents totaling 36 individuals staying eight to 36 nights and 48 'sporadic' residents staying one to six nights. The latter two categories of kin were drawn from both actual and classificatory kin (2008, p.64, p.71). For the census period of 221 non-consecutive nights, the minimum occupancy was nine people, the maximum 30, and an overall average of 17 individuals. Emphasising the sheer volume of people sleeping in the *jilimi,* it was noted that more than 160 individuals were recorded. However, Musharbash concludes that this was a conservative estimate due to a failure to count nocturnal and early morning residential shifts and 'sorry mobs'[5] (2008, pp.61–2).

Immediacy is the second value analysed by Musharbash, and best described from her personal perspective as 'everything happened when it happened, rather than when I wanted it to happen' (2008, p.11, p.94). It is a core value that involves a willingness to relinquish individual scheduled activity or objectives through succumbing to a more fluid external process of events unfolding, by ' … participating in the collective push and pull of "being in the present".' (2008, p.11). There is a event hierarchy according to the Warlpiri worldview and this prescribes how quickly events are responded to; for

[4] This approach is specifically employed by Musharbash as a critique of the inadequacy and yet prevalent use of the term, 'household' utilised in housing research and in ABS Census data.

[5] Group of mourners who travel from other settlements to engage in ritualised mortuary behaviour (Musharbash 2008, p.165).

example mortuary rituals in the case of death sit at the pinnacle of the hierarchy, causing the rescheduling of other events. The last of the tripartite values identified by Musharbash (2008, pp.95–7) is intimacy, knowing closely the bodies of others, generated largely from the fluidity of sleeping arrangements, albeit constrained within the socio-spatial categories of married people's camps, single men's camps, and single women's camps.

On the direct subject of crowding, little is elaborated on by Musharbash, other than passing references about frequent tensions arising from 'gambling schools'[6] involving unidentified residents complaining about the camp becoming 'dirty', or about people who 'just leave their rubbish' and 'use the toilet all the time' as a response to the high volumes of people being hosted. Significantly, the 'gambling schools' that operated day and night on a regular fortnightly basis, became problematic to residents when it interfered with the sleep of core residents. The strategy employed to disperse gambling participants was indirect action by turning off the electricity and declaring the power meter was empty (2008, p.127).[7]

2.6 Broome, WA. Nillir Irbanjin Study

Nillir Irbanjin is a small community of ten houses located 1.6 kilometres north of the town of Broome in Western Australia and researched by Birdsall-Jones and Corunna in 2008. The base population was somewhat variable, but was probably between 70 and 120 people (Birdsall-Jones & Corunna et al. 2010). In 2008 Nillir Irbanjin had very serious crowding problems caused primarily by visitors from outlying Kimberley Aboriginal communities. It is in a relatively isolated position and so the community did not have easy access to the town's services including health, education, shopping, policing and so forth. On account of the increased population the community and the housing suffered from a higher rate of use than that for which it was originally designed. The majority of the houses therefore had wastewater and toilet malfunctions, damaged doors and windows, and electrical faults making the major appliances unsafe for use.

Waste collection had recently become another major problem. Nillir Irbanjin is a discrete Aboriginal community and therefore its residents paid no rates to the town council of Broome, which was true of other discrete Aboriginal communities within the boundaries of Western Australian towns. The problem this causes with regard to waste removal is that because they pay no local rates, the waste removal service must be paid for by the community. This was not possible for Nillir Irbanjin because, owing to various cuts in the programs available to the community, their entire income came from the rent collected on the ten houses that made up the community. They did not have enough income to fund all the services they needed and waste collection unfortunately was one service for which they could no longer pay.

It appeared that the flow-on effect of the crowding caused by the visitors that bothered the community the most was the squalid living conditions to which they were subjected, both in individual households and in the community neighbourhood.

[6] Gambling in Aboriginal settlements is a common feature, see Musharbash (2008, p.180) endnote 15 for further references on the topic.

[7] However, perhaps more revealing and underpinning Warlpiri sociality, and demonstrating the Warlpiri tolerance of very high density is the permission given to the researcher to co-reside in the *jilimi* of ten occupants. Perhaps a more poignant reason than extending hospitality, that goes to the heart of the reciprocal nature of demand sharing, is that her adoption came with a Toyota which enhanced the residents' own mobility, increasing access and frequency to other prized commodities such as firewood, bush game and vegetables, and football games (Musharbash 2008, pp.13-16, p.86, pp.126-7, pp.132-7, p.148).

2.6.1 Public housing within the town of Broome

Although public housing within the town of Broome was also crowded, the situation within the town itself was found to play out very differently to that of Nillir Irbanjin (Birdsall-Jones & Corunna et al. 2010). Public housing in Broome is the responsibility of the Western Australia Department of Housing (WADoH) and the Department always pays the rates on its properties. Waste removal is not a problem. However, it was found that household crowding was common among Aboriginal public housing tenants within the town (Birdsall-Jones & Corunna et al. 2010). Further research is necessary in order to properly gauge the situation, but investigations into crowding at a few houses gave a clear indication of a shortage of public and affordable housing in Broome.

There were several young men who were in work but whose wages made them and their families ineligible for public housing. They had tried to obtain private rental housing but found that it was either too expensive or they could not gain acceptance as tenants. In one of these cases, the young man's mother already had turned every possible room to a sleeping space, provided improvised shelter in a tent to two of her other sons, and all she had left to offer was a space behind an improvised barrier in her car port. This young man could not have his young wife and child in such a situation and so she went to live with other kinfolk who lived nearby in public housing to enable her son's family to take her room.

3 CHARACTERISTICS OF ABORIGINAL OCCUPANCY AND MODELS OF CROWDING

As outlined in the analysis in our previous section, crowding is a complex field of social analysis, though it is generally agreed that it is defined as a state involving an unacceptable density of persons, along with a perception of stress. Marked cross-cultural differences are noted in the literature in varied social and cultural manifestations of crowding (Gillis et al. 1986; Memmott 1991, p.255; Chan 1999). The Australian literature clearly establishes that Aboriginal crowding perceptions are culturally distinct across a number of diverse geographic locations in varied housing circumstances[8]. This is with particular regard to the nature of avoidance relationships, and also the ways in which customary practices involving obligation are modified by authority relations.

Thus there is a need to define the characteristics of Indigenous residential behaviour with the aim to modeling the specifics of crowding. Given that extended kin households are a persistent feature of Aboriginal communities, defining what in fact would be the ideal or maximum residential size for an Aboriginal household is critical. In the absence of available information, government policy and programs continue to be implemented without knowing what numbers of household occupation would be considered the tipping balance for a particular sized house between healthy living practices, infrastructure functionality and social stability.

The related issue of Indigenous privacy has garnered passing references, but particular research analysis needs to be developed, as it remains systematically undefined as noted by Memmott (1988, p.40) over two decades ago. Where Indigenous crowding is frequently correlated with the poor state of housing and as a contributor to Indigenous health problems, assessments often also state that the under-supply of housing (or the backlog of unmet need) to be the single cause of crowding. The dynamic complexity of crowding mitigates against simplistic, metric analysis at this stage, as we discussed in our analysis of crowding more generally, as the terms of the model and relationships between the relevant phenomena are as yet not well understood. Further consequences of crowding for occupants of these households mentioned directly or indirectly are social dysfunction, mental and physical wellbeing.[9]

For example, the types and structures of Aboriginal households may vary in certain ways between the remote regions on the continent, as well as in the rural urban and metropolitan settlements. Ongoing research needs to isolate both quantitative and qualitative evidence-based distinctions between the negative impacts of crowding and the pre-existing personal, social and environmental conditions that may or may not relate to crowding.

3.1 The influence of Aboriginal kinship on household behaviour

Aboriginal kinship systems provide patterns of behaviour for many of life's situations and strongly influence and govern the occupation of housing (Memmott et al. 2000; Memmott 2003, p.29; Kirke 2003). The behavioural patterns involved are codified by

[8] See Reser (1979), Ross (1987), Nganampa Health Council (1987), Memmott (1988, pp.34-47), Memmott (1991, pp.255-62), Memmott & Chambers (2002, pp.88-97), FaHCSIA (2007, pp.137-45), Birdsall-Jones & Corunna et al. (2010).

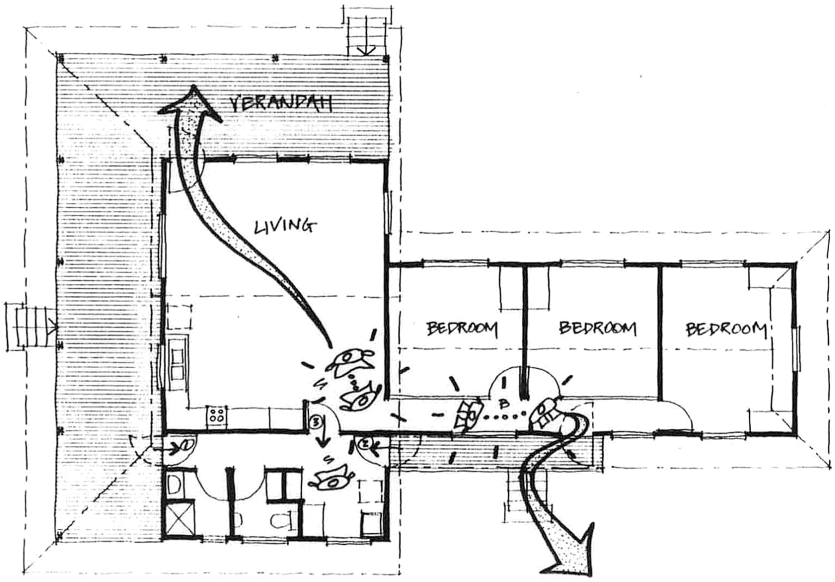
[9] Wild & Anderson (2007, pp.57-75, p.166), Long et al. (2007, p.24), Bailie (2008, p.59), Fien et al. (2008, p.24), Davidson et al. (2010, p.43)

the various types of kin-based relationships, such as father-son, mother's brother, sister's son and so on. The prescribed behaviours manifest as socially appropriate or inappropriate conduct and obligations; for example, a certain relationship demands that the two persons concerned perform certain duties towards one another such as sharing of food resources. It may also stipulate that certain things be not done, for example, that no direct communication occur between certain relatives (Elkin 1938, p.69).

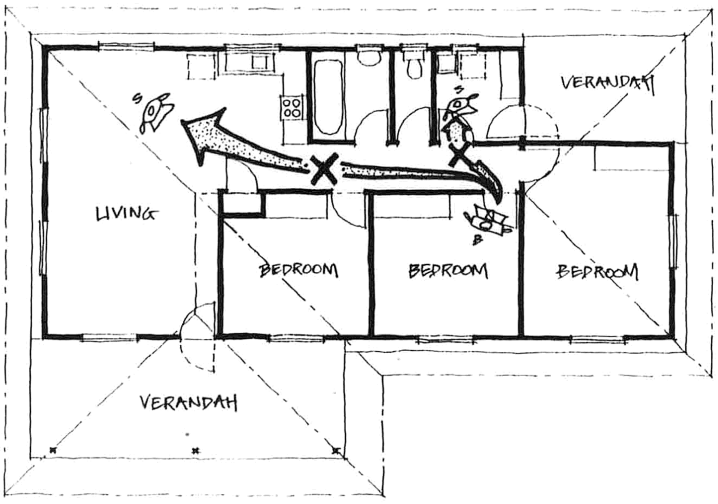
These behavioural rules manifest in the domiciliary spaces of remote Aboriginal communities and are defined as socio-spatial behaviour (Memmott 2007, p.29). When some of the rules and obligations based on kinship affect socio-spatial behaviour, or the actions of people in spatial relationships towards one another—it can cause a shift in either their relative spatial positions, their orientations, or the extent of their body or eye contact—seen as an expression of their particular social relations. A new arrival in a domiciliary group can precipitate a shift in spatial behaviour depending on the particular kinship relationships between the newcomer and the existing members of the group. Kin access rights and obligations in connection with residential occupancy has also been observed by Birdsall-Jones (1990) who found strong evidence that in order to access housing in times of need, the individual's right to request such aid was strongly dependent on the currency of identity within the extended kin group. Personal and social identity in non-remote Aboriginal society is dependent on having detailed experiential knowledge of kin connection in the various places where the extended family resides. The social recognition and regular reinforcement of such kin networks, facilitate the access of individuals to other's houses. Conversely, as demonstrated by Musharbash (2008, pp.62-3, p.100) the absenteeism of core householders in her Warlpiri study group at Yuendumu for up to 21 days in no way undermines stability of the household group due to its recognised social cohesion.

A special category of respect among certain language groups involves the rules of avoidance between men and their mothers-in-law, and between women and their adult brothers. These rules apply to small group behaviour where individuals are present in a single room of a house (e.g. watching television), but also underpin how residents may be sub-divided into sub-groups occupying separate parts of the house (Memmott 2011). Figure 2 illustrates how an inappropriately designed house may compromise the necessary avoidance behaviour between an adult brother and sister. The two floor plans were completed in 2003 at Nguiu. The top plan readily accommodates brother/sister avoidance behavior in its design by reducing the possibility of 'running into each other', whilst the bottom plan does not. Note, in both plans, if the sister is sleeping in the living/kitchen room, her brothers cannot access the kitchen. These culturally-specific avoidance rules thus shed light on the specific circumstances of crowding that are discussed theoretically by Gillis et al. (1986, p.690), although with the critical difference that we have identified not only an Aboriginal strategy of coping with crowding, but in this case the specific prescribed rules of avoidance and behavioural patterns which, if not observed, may cause the perception of crowding.

Figure 2: The avoidance rule between adult brothers and sisters in Top End communities and the implications for housing design



Plan A



Plan B

Source: Fantin 2003b, p.77

3.2 Understanding Aboriginal household dynamics

The structure of Aboriginal households is not unusually different from mainstream Australian experience in that they are typically dynamic according to patterns of relationships, albeit with manifestations not usually seen in Anglo-Australian households. Residential surveys of remote settlements throughout recent decades

have indicated the persistence of customary domiciliary or household groups in both northern and central Australia (e.g. remote Northern Territory, Queensland and Western Australia), via (a) the nuclear family, (b) the single men's group, and (c) the single women's group,[10] as well as the emergence of other structurally diverse household forms that have arisen partly because of the cultural change effected in domestic economies (welfare benefits), social authority structures and residence in Western houses (Memmott et al. 2000; Long et al. 2007, p.53).

In many cases we find several customary family units occupying a single house, each residing in a separate bedroom. Houses therefore do not necessarily correlate with single family units in contemporary Aboriginal societies. Aboriginal households tend to be larger and more complex, often including a number of family sub-groups, but all of whom are inter-related by descent. Household sizes of six to 12 people are common, and much larger multi-generational ones of up to 20 members can be regularly encountered. Some of these large households have a matrifocal structure (Memmott 2011). It appears that although these households seem to resemble customary household camps, they also differ with regard to density per domicile and domicile zone. Distances between customary domiciles and their spatial layout vary considerably. In a customary camp setting, individual hearth groups occupied a single domicile that could be physically shifted according to the prevailing conditions of weather or the changing relationships among inter-related hearth groups in the camp setting. This customary behaviour is not reflective of higher household density and occupation commonly prevalent throughout modern Aboriginal Australia because the physically permanent, immovable and immutable nature of a house alters the dynamic prospects of the camp situation (Memmott 2007, pp.28–31; 2003, pp.26–31; Memmott 1979, pp.366–7; Go-Sam 1997, pp.31–3).

Remote Aboriginal families do not use the rooms of a house according to the same patterns of usage as Anglo-Australians who tend to maintain a clear division between the rooms of shared social use (living, dining, kitchen) and private bedrooms. In the largest Aboriginal households, it is normal to find each bedroom occupied by a family unit comprising of, for example, a couple with infants, or a single parent with a child, or a group of single men or single women, or a grandparent with several infants or teenagers. Such a sub-unit would be considered a family unit in mainstream Australian society. In some cases these families are residing together because of housing shortages. However, in many other cases they may choose to reside in such large household groupings, in keeping with kinship obligations (demand sharing and reciprocity, see Peterson 1993) (Memmott 2011). Much the same patterns of Aboriginal household use have been found in Western Australian urban situations (Birdsall-Jones 1990; Birdsall-Jones & Corunna 2008; Birdsall-Jones & Corunna et al. 2010).

As noted previously, in reality these averages are even higher at particular times during the year because of visiting kin. Visitors are prevalent in Indigenous households, and residential visitation is a social norm and often an obligation, and in some cases Indigenous people do not distinguish between resident and visitor[11] (Long et al. 2007, p.55). According to Aboriginal kinship practices, the sharing of accommodation with certain relatives is a social responsibility and desirable. Visitors will usually stay at a relative's house for anywhere between a single night and a number of months. Indigenous household structures are therefore typically dynamic.

[10] For the design of single women's houses see Cathy Keys (1996, 1999).

[11] Or at least not in the same way that ABS enumerates visitors, which is defined by their being not 'usual residents' have stayed, or intend to stay, for a minimum of six months at that current address (ABS 2009).

(Memmott et al. 2000, p.40) While acknowledging that households are dynamic by nature, the National Indigenous Housing Design Guideline (FaHCSIA 2007, p.137) mentions that some Aboriginal families choose to live in large, multi-generational households in which occupants do not recognise or acknowledge crowding, despite other vacant houses being available in the community. Although Memmott (2011) identifies that kinship obligations may explain this behaviour, there may be other reasons not fully elicited that contribute to large households sustained over a long period of time.

3.3 The relationship between large Indigenous households and crowding

As outlined earlier, the dominant, stress-based model of crowding, common to the social sciences, holds that states of crowding may involve a wide range of density settings that generate certain stimuli, which induce stress in setting participants according to their values of the environmental acceptability and non-acceptability of these stimuli. In the case of remote Aboriginal groups, the stimulus that induces stress has often been the presence of inappropriate categories of kin in too close proximity. In terms of spatial scale, crowding at the scales of room, house and neighbourhood can all occur in remote Aboriginal communities as well as in non-remote communities.

To minimise any stresses arising from high density living in both remote and non-remote Aboriginal households, a common coping mechanism is the purposefully arranged setting structured by the householders, achieved through rules governing the combinations of people allocated to living and sleeping spaces which introduce what are perceived to be ordered and safe behavioural practices and patterns. Contrary to the suggestion by Gillis et al. (1986) that it is primarily the gregarious nature of 'contact' cultures which increases the ability to cope with crowding, in the example of Aboriginal Australia, cultural traits of behavioural rules and protocols which regulate behaviour seem to increase tolerance for high-density situations. If, for example, a sub-group of unmarried women are allocated a room in a large household, their numbers are unlikely to be a concern and they will sleep within touching distance of one another. In the authors' experience, the arrangement of people in sleeping spaces thus occurs according to combinations based on age, gender, conjugal status and kin relationships. Despite being a large household it may not be regarded as crowded. If the core members of such a rule-governed household are stable, such households may endure for years.

One sub-group of householders (often including the senior householder) may sleep and live in the 'living room' of the house, irrespective of whether bedrooms are too small or too few. The room is furnished with mattresses on which people will sit or lie engaging in social discourse or sleep as they wish. This differs from the typical Anglo-Australian living room, which often features a couch and a television, but which is seldom used as a nocturnal sleeping room.

Birdsall-Jones has recognised in her research that a threshold of stress may arise, even for the rule-governed household, when the density increases to the point whereby there is no means of allocating sleeping space to persons without placing them in situations which compromise the need for respect among kin. Such a situation may bring on stress and emotional responses, which may include shame, jealousy, anger and violence. If there are substance abusers included within such a household, then the stress on other household members becomes too much to bear. Those most endangered or intolerant will tend to be among the first to leave. Children and the elderly will possibly leave to stay with other kinfolk. The future composition of the household will come to depend on whether or not anyone takes responsibility for

paying the rent. If not, the public housing authority will revoke the lease and reallocate the house. This will leave the former members of the household, mothers and children and the elderly, in a situation of secondary homelessness as they seek housing with various of their relations.

3.3.1 Neighbourhood crowding

There is no literature that systemically defines and reviews neighbourhood crowding (as opposed to household crowding) in Indigenous settlements. Memmott and Moran (2001) argue that neighbourhood crowding could be as relevant a topic as room crowding and house crowding for Aboriginal Australia. All these identified forms of crowding can occur in both remote and non-remote Aboriginal communities. However, there are various case studies embedded in ethnographies that tell us something of this phenomena and deserve a separate search and analysis in their own right. For example an early medical field analysis by Kamian found:

> … that 74 per cent of all the Aboriginal women in Bourke suffering from an anxiety state had two white neighbours. Forty per cent of these were definite in attributing their symptoms to the time of moving from the Reserve to town. [He infers that] … since they live in a state of virtual siege by their white neighbours who do not want them, and since they become isolated to a degree from their relatives and friends on the Reserve, it is not a great wonder that symptoms of anxiety and depression should manifest at this time. (Kamien 1976)

The passage refers to the past policy of 'scatterisation', whereby forced Aboriginal tenancy placements in white neighbourhoods aimed to assimilate, but inadvertently created among Aboriginal residents a state of anxiety due to racial tensions, conforming to the broad description of cross-cultural crowding.

In any town or city, there exist certain neighbourhoods that are locally known trouble spots. In both Broome and Carnarvon Aboriginal societies these areas are characterised as the 'Bronx' (Birdsall-Jones & Corunna 2008). These are neighbourhoods that are almost exclusively public housing occupied by Aboriginal family groups. Such a neighbourhood is the site of a localised form of regular violent behaviour including vandalism, occupying public open spaces for gatherings focused on substance abuse, and loud and violent behaviour in the street that is understood as the result of substance abuse. It may be aimed at residents of the neighbourhood on a seemingly random basis and is understood by residents to be deliberately calculated to threaten. While this kind of violence may occur among people who are in some way related, it is not by nature a kin-based form of violence and is to be distinguished from the inter-clan or inter-family feuding that has been reported, for example, in Wadeye in recent years and also in country towns in south-western Western Australia.

All such neighbourhoods, however, that display violent patterns should be explored in the specific research context of crowding in order to understand their development and how such developments may be avoided by public housing providers. Gillis et al. (1986) discuss the possibility of ethnic concentrations within a neighbourhood as a 'salient contextual variable' (1986, p.702) in crowding, which seems to be a relevant factor here in the case of scatterisation as discussed by Kamien, and in Broome where high concentrations of Aboriginal people may have lead to increased dysfunctional behaviour.

3.3.2 Aboriginal mobility

On the topic of household composition and mobility, Moran (2006, p.31) notes that crowding may be an ever-shifting phenomenon and that a 'single Indigenous house may be doing the job of three or more houses'. Due to high residential mobility 'one group may occupy several houses simultaneously'. The objective to reduce the fluid and changing entity of crowding through a housing program has been a frequent strategy of governments, as was the aim of the ongoing Strategic Indigenous Housing and Infrastructure Program (SIHIP) in the Northern Territory, under the National Partnership Agreement on Remote Indigenous Housing. The program aims to reduce crowding but has its challenges in developing objective, low-cost performance measurements of crowding.

The constant flux of household populations as reported in studies of Indigenous crowding, mobility and homelessness, has resulted in the Australian Institute of Health and Welfare (AIHW 2009, p.56) classifying such Indigenous people who rely on friends and relatives as being technically homeless, noting that a total of 9248 people representing 1.9 per cent of the Indigenous population as homeless.[12] The inter-related research topics of homelessness and mobility are not included in this study, but they are noted in passing as phenomena that contribute to household crowding, undermine the stability of tenancies and contribute to high levels of household service malfunction of fixtures and fittings (Long et al. 2007, p.27, p.78; Fien et al. 2008, pp.74–5; Habibis et al. 2010).

3.4 Poor health and crowding

In recent years, where correlations are drawn between the poor state of housing and the problems of Aboriginal health, they have usually centred on [so called] 'overcrowding' and the under-supply of housing as the combined major contributing factors, not only contributing to social dysfunction but also to the poor mental and physical wellbeing of the residents.[13] There are, however, divergent opinions between self-assessed perceptions by Aboriginal household residents and perceptions by non-resident observers. As reported in Booth and Carroll (2005) who examined the relationship between crowding and self-assessed health status of Aboriginal Australians, they found that crowding had little relationship to self-assessed health status. Yet they also noted a trend for better health among those living in larger dwellings with fewer adult occupants (Long et al. 2007, p.95).

Recent discussions on psychological stress have pointed to the persistent phenomenon of crowding as a major factor, yet how these factors interact with other significant environmental and social influences affecting health, needs to be more carefully examined to gain guidelines for improving health benefits for residents (Bailie 2008, p.59). Bailie's (2008, pp.59–60) preliminary health and housing findings for the *Housing Improvement and Child Health* Study (HICH) carried out between 2003–05, drew data on children and their carers from ten remote study communities in the Northern Territory where significant building programs under the National Aboriginal Health Strategy (NAHS) over the period 2004–05 were undertaken. They showed that there was 'a clear association between crowded household conditions and (1) the functional state of house infrastructure, and (2) the hygienic condition of houses'. However, Bailie's team was not able to establish a direct link between crowding and

[12] Further specific state or territory data on Indigenous households that are 'overcrowded' (P22) and additional bedrooms required (P21) is incomplete, so that contributing factors defining Indigenous housing need under these categories is not quantified or accessible (AIHW 2009, pp.20-21).

[13] See Wild and Anderson 2007:57-75,166, Long et al. 2007:24, Bailie 2008:59, Fien et al. 2008:24, FaHCSIA 2007:137-145, Pholeros 2010

psychological wellbeing, nor between crowding and the functional state of infrastructure. They were able to state that:

> The general psychological well-being of carers was associated with broad community level factors such as overall quality of community housing and housing management, and community location and exposure to stressors in their daily lives (which may arise within household or in the broader community).(Bailie 2008, p.59)

Bailie's (2008) evaluation of NAHS programs noted above was further synthesised in Ballie et al. (2010), with specific attention to measurement methods employed in the study and its findings on the level of crowding, infrastructure function and hygiene outcomes. The joint team concluded little improvements in reducing housing-related health risks through infrastructure programs, if domestic hygiene was neglected. They confirmed high household densities across the study group with an average population of 11 people per house, which were markedly higher than the national average for Indigenous households of 3.5 people per house, and the average for all Australian households of 2.6 people per house. The study raised a major implication for policy and further research: the need for better quality evidence on the relative health benefits of different components of housing infrastructure to support the design of houses that will generate the greatest potential in health gain.

Bailie's (2008, p.59, p.60) general point here is that the relationships between housing and health, operate within a complex and dynamic multi-variant field of internal and external factors in houses, households, communities and cultural regions. It is understood that crowded household conditions do increase the probability of spreading infectious diseases among occupants, as argued by FaHCSIA (Aust. Dept FaHCSIA 2007, p.137). However, poor health may be exacerbated by a number of other contributing factors, such as poor household infrastructure, high incidence of exposure to infection, poor commercial food supply and dieting practices, poor security over household food, the mental health of other householders, and social influences on health, along with limited effective management of health and housing (Bailie & Runcie 2001, p.365; Bailie 2008, pp.59–60).

With specific regard to Western Australia, the WA Aboriginal Child Health Survey (WAACHS) (2006) found that a high household occupancy level was a protective factor against the child's experience of emotion and behavioural difficulties.

> Children living in homes with a high household occupancy level were half as likely to be at high risk of clinically significant emotional or behavioural difficulties than children living in homes with a low household occupancy level. (Zubrick et al. 2004, p.102)

This finding goes against current policy concept regarding Aboriginal child health and crowding; viz. that crowded houses are more likely to result in paedophilia (ABC News 2011). Another unexpected finding involved the remoteness of the community.

> Children living in areas of extreme isolation were one-fifth as likely to be at high risk of clinically significant emotional or behavioural difficulties compared with children in the Perth metropolitan area (no isolation). (Zubrick et al. 2004, p.102)

Although child emotional and behavioural difficulties are not a focal topic element of the present research, these findings demonstrate how poorly understood are the dynamics of Aboriginal household crowding and occupancy levels generally. In the process of developing an Aboriginal household crowding model we may be able to shed some light on the findings of the WAACHS study in these regards. For example,

it should be noted that Zubrick et al. avoid the use of the term ‘overcrowding’ wherever possible, instead choosing the more neutral term, ‘household occupancy level’ and modifying this with ‘low’ or ‘high’. Zubrick et al. note the complexity of contemporary Aboriginal household composition. In particular they note that chronic housing shortages and the ‘social upheaval’ which follows the regular changes of policy and programs imposed by governments mean that Aboriginal people experience chronic exposure to high household occupancy levels. It remains as a part of our task to provide a means of distinguishing between high household occupancy levels which result in crowding and those which result in an orderly, consistently well-run household.

4 ABORIGINAL RESPONSES AND STRATEGIES TO CROWDING

This last section of the Positioning Paper contains an overview of the reported responses and strategies that Aboriginal people use to prevent or alleviate stress-based crowding. They include socio-spatial strategies, the use of flexible architecture, residential shifts, use of personal space and avoidance relationships, and the behavioural values of shame, respect and intimacy.

4.1 Socio-spatial strategies

Ross reports (1987, p.123) for Halls Creek (in 1980–81) that a common coping mechanism to avoid the conflicts of settlement crowding and achieve peace and quiet was to reside in a small distanced camp of one or two nuclear families or elderly couples. The emphasis was still to live with family but away from the 'mob'. 'Those wishing to limit the size of their household assumed that they would do so by means of a spatial deterrent such as a tiny house or an inconvenient location, not a social one … ' [such as a refusal or other inhospitable action.] (Ross 1987, p.115).

Reser has made the general point that in traditionally-oriented Aboriginal camps:

> … considerable privacy is afforded by social convention rather than physical barriers or distance. It is also the case though that there is greater inter-family distance and considerable surrounding and interspersed bush in the typical camp situation. (Reser 1979, p.86)

These two categories of coping mechanisms, social conventions and inter-family distancing, need to be considered in some detail in the Final Report of this project.

From the available data on Wilcannia's town camps, it can be argued that a key mechanism to minimise stress was the tendency for family and close kin to reside in relatively close proximity, in clusters, but with sizeable distances between adjacent clusters. Examination of the settlement plans in 1970 and 1974 demonstrates that there were definite clusters of humpies. The socio-spatial analysis of the Mallee in 1974 demonstrated further that each cluster was a meaningful social unit with a distinct identity based on family ties and language group identity. Measurements from the 1974 settlement plan indicate that the average distance between adjacent humpies within clusters is 65 metres (7 clusters, 34 humpies, range 20–112 metres), and the average distance between adjacent clusters (taken as being between the closest humpies of two adjacent clusters) is 204.6 metres (7 clusters, range 127-357 metres). In comparison, the distances between the Mission houses are 7.3 metres from side to side, and 15.3 metres from front to front of houses. (Memmott 1991, p.259, p.260)

However the reader is warned that the identification of optimum spacing distances (as with the measurement of density) is not a straightforward task given the multi-variant nature of crowding and privacy constructs. As well as being affected by many social factors, perceived distances may vary from actual distance, due to landscape features such as foliage, or a road reinforcing a socio-spatial boundary. The distance required may depend in part on the physical proximity of senior authority figures within the extended family group. Birdsall-Jones (1990) found that the four most senior women in the extended kin group she studied all lived in different towns and had gathered in each town a set of younger women who looked primarily to the local senior woman for both the exercise and basis of power and authority within their local kin network.

The affect on crowding of mobile populations as a result of complex power and authority relationships is not reported in the international crowding literature. Further investigation of complex cultural factors such as this will contribute to a much richer and more complete understanding of crowding at the scale of region as well as smaller, better-examined scales.

4.1.1 Use of flexible architecture to reorganise socio-spatial relations

The socio-spatial structure of groups within a traditional Aboriginal camp was very fluid and often changing due to the intermittent arrival and departure of families and individuals. The dynamic social structures were partly facilitated by the temporary nature of many shelter types. Diurnal activity centres and nocturnal sleeping places were quickly established in many camps through the construction of windbreaks, shades or simply the location of a hearth. More energy investment in shelter construction occurred under climatic extremes, but a shelter could still be moved and reassembled using the same materials if necessary. Individuals and small groups could thus adjust their spatial position and orientation with respect to other groups, permitting desired contact and interaction with some individuals, but at the same time maintaining obligatory avoidance with certain categories of kin. (Memmott 1991, p.261; 2007, p.126, p.127)

These modes of behaviour have continued in certain parts of Aboriginal Australia. Reser commented (1979, p.86) on camp fluidity in Arnhem Land in the mid-1970s with structures of pole and bark, and suspended mosquito nets for sleeping. White (1974, p.3) has provided details for the Pitjantjatjara and Tjangkuntjara of the Great Victorian Desert. For example, if a young couple and their children camped next to the wife's mother, their shelters were sited behind one another, and oriented in opposite directions, so that the mother and her son-in-law could physically (and symbolically) exercise their avoidance. (This was in spite of the inconvenience of uncomfortable prevailing winds) (Memmott 1991, p.261).

Even with conventional houses, Aboriginal people employ flexible architectural devices in response to crowding and to achieve privacy. People establish semi-enclosed or outdoor sleeping spaces on verandahs and in yards. They also prevent unwanted visual access from outside, by draping blankets or other types of fabrics over windows and strapping sheets of galvanised iron or plywood on to the side of verandahs. Windbreaks may also be built adjacent to houses for outdoor hearth-centred activity and for nocturnal sleeping.

Aboriginal domiciliary spatial arrangements, whether they be within a house or within the landscape, respond to circumstances of social, economic and customary authority (Memmott 2003, p.30). In customary orientated households, sub-groups have organised themselves by occupying separate room spaces (Memmott 2003, p.30). Smith and Daly (2000, p.103) have noted larger family household systems residing together in supportive economic situations. Nevertheless, household sub-groups may store their food separately in their bedrooms and even use lockable fridges or eskies in their rooms. (Note that this was earlier identified as a mechanism to alleviate crowding stress in Anderson's (1972) Asian study.)

4.1.2 Residential shifts

One outlet valve from localised stress is residential mobility. For example the study by Memmott et al. (2004, pp.4-5, p.61) examining the underlying reasons for mobility in the Mt Isa region indicates that one of its many explanations is that it may provide immediate relief and escape from the stresses of home community life.

Residential shifts act as a standard coping mechanism for alleviating stressful residential circumstances. Such shifts may involve moving to another part of a settlement to stay with a related household, or to another town where other kinfolk might be found, or out bush if there is a territorial option to do so (e.g. permission from the local traditional country owner) (Memmott 1991, p.260). This mechanism effectively controlled access of others to oneself, and has been noted for a number of Aboriginal groups, such as the Mornington Islanders (Memmott 1979, p.374), Nyungar people (Birdsall-Jones 1990) and Broome Aboriginal people (Birdsall-Jones & Corunna 2008, 2010).

Inter- and intra-settlement mobility was certainly a characteristic of the Wilcannia Aboriginal population, although restricted to the local region, as was first recorded by Beckett in the 1950s and 1960s. The most mobile categories of people at this time were young men and women, and old widows. Beckett reported that only a few instances of household fission occurred due to conflict, but in such cases where they did, individuals moved to stay with relatives in some other part of town, or perhaps at Menindee, Murrin Bridge, Bourke or Broken Hill. Residential movement in Wilcannia was no doubt facilitated by the spatial dichotomy of the Mallee and the Mission in the 1960s, and the Mallee, Mission and town in the late 1970s and 1980s. These Aboriginal sectors of town presented alternative residential options. It would appear that this threefold division of Aboriginal residential sectors to be found in Wilcannia superseded the structure of town camp humpy clusters mentioned previously (Memmott 1991, p.260).

However, the research on Aboriginal mobility factors as an antecedent to crowding is not without conundrums, as noted by Flatau et al. (2005, p.191) and previously Memmott (1988, 1991) and Memmott and Chambers (2002). Indigenous residents may not express annoyance with high-density households even though unacceptable negative impacts are experienced. The relevance of social capital studies may have significant bearing on explaining this conundrum. Although differing cultural norms in relation to the nature of perceived crowding may exist between Aboriginal and non-Aboriginal households, at the same time, distorted cultural norms may exist in certain Aboriginal households, such as the tolerance of high alcohol consumption that has created broad levels of overt and subtle dysfunction (Wild & Anderson 2007, p.166).

4.1.3 Personal space and avoidance relationships

One social convention that has been mentioned as a mechanism to achieve privacy is 'personal space'. Personal space is a self-regulated 'invisible' boundary or separation between the self and others permitting differential access to the self as situations change, and thus the regulation of interpersonal interactions and the achievement of desired levels of privacy (Altman 1975, p.53, p.54; Chan 1999). Among many Australian Aboriginal people, personal space has been reported (e.g. by Memmott 1979, p.371) to have a marked tactile dimension typical of the 'contact cultures' described by Hall (1966, pp.109–20) and noted by Gillis et al. (1986) for their assumed increased tolerance of high density situations. These include the Middle Eastern, Mediterranean and Latin American peoples, who are accustomed when interacting with others, to using closer distances than the people from northern and western European cultures (Memmott 1991, p.260; 1979, pp.370–8).

Memmott observed in remote Aboriginal communities during the 1970s that it was not unusual to see young men holding hands, or old men greeting each other with kisses. In all of the authors' experiences, Aboriginal individuals are normally relaxed and at ease when spatially close to relatives and kinsmen. A high level of proximate tactile interaction among family and friends occurs during sleeping behaviour. In public settings people sit in small groups whose members show close spatial interaction,

with parts of the body often touching (limbs overlapping, hands touching, mutual grooming) (Memmott 1991, p.260). More recently, Musharbash (2008, p.99) has written of the experience of close co-sleeping 'with a large (but ranging) number of people resulting in intimate knowledge of these people's bodies.'

The previous discussion on sleeping behaviour in Wilcannia also provides evidence that this community was maintaining regular tactile interaction and close personal space in this same manner. Savarton and George had observed in 1970 that there was a 'contrasting set of assumptions concerning the body and the rights associated with it' (Savarton & George 1971, Ch.11.3.0). (Memmott 1991, p.260, p.261) However these characteristics of personal space only pertain to certain types of relationships. It is seldom that close contact occurs with strangers, particularly non-Aboriginal ones. Even among kin there is variation in communication style that articulates levels and degrees of personal access and contact between individuals. In traditional Aboriginal societies such variation was clearly prescribed.

Briefly to another New South Wales location, there is a short but valuable observation of privacy and stress perception in a Bourke house, recorded in 1971 by the medical doctor Max Kamien (Kamien 1978).[14] The householder was the senior woman of a large family which constituted the highest-density residence in Bourke at that time, having a maximum observed occupancy of 36 in a three-bedroom house. Kamien's comment relates:

> From her point of view, the worst thing about the overcrowding was the noise. She attributed her nerviness to this. 'It's not nice living like this, but I'm not going to let my family live under a tree.' One of her daughters stated, 'It's so noisy, you can't get any rest. There's no room for the children to play and arguments flare up over nothing. There's no privacy in this house.' This daughter had refused to breast-feed both of her children because of a lack of privacy. 'I won't breast-feed my children with everybody looking at me.' This undoubtedly contributed to their recurrent gastrointestinal infections. (Kamien 1978, p.66, p.67)

The concern over privacy for breastfeeding does not appear to be a traditional Aboriginal value, and may have been a consequence of the imposition of Mission values and inter-cultural town life in the history of this, and most other Aboriginal groups. Another type of related stress recorded by Kamien in this household was the conflict of one member of the family with her employer due to her lack of punctuality in commencing work, which in turn was due to 30 or more people attempting to use a single bathroom/toilet every morning. In none of these reports do we find perceived crowding linked to ill-health (apart from psychological ill-health), and one must hypothesise that Aboriginal people may not necessarily recognise this association in many cases. (Memmott 1991, p.259)

Separate to the focus on stress resulting from crowding due to a lack of privacy, Musharbash (2008, p.41, p.43) describes in detail how Warlpiri group privacy is maintained through negotiated access to *yunta* (windbreak or sleeping space)[15] depending on the degrees of closeness between people inside the camp and the person wanting entry. Entry to the *yunta* is regulated by making one's physical

[14] Kamien (1978, p.65) also calculated that 92 Aboriginal households in Bourke had an average occupancy of 7.9 with half of their dwellings less than 18 square metres. In comparison 1160 non-Aboriginal households in Bourke had an average household occupancy of 3.8.

[15] A *yunta* or windbreak can be constructed out of leafy branches or utlisation of existing structures. Therefore it can also be the wall of a room or verandah or a car. The *yunta* are set up after dark and used for sleeping, however in the morning bedding is placed out of sight (Musharbash 2008, p.41).

presence known to the occupants, but at a distance from the inside of the camp. Musharbash (2008, p.42) likens this entry behaviour to having a door opened or unopened. Some individuals based on established familiarity are welcome into the camp and they do not require negotiated access. These individuals are sure of their rights of access and welcomed by occupants. They do not have to wait for permission to enter at the invisible threshold, but can walk into the camp and freely engage with the occupants. However, the uninvited entrance into the *yunta* space by those who require permission and rights of access would be considered rude or a threatening behaviour.

Musharbash (2008) observes significantly, that a single person's *yunta* operating as an individual camp on its own does not exist in Warlpiri society. She emphasises that close personal contact between kin is the norm and to be without kin is something to be avoided. Therefore sleeping alone is an impossibility, and in any case is perceived to be undesirable because the person may become 'lonely' and companionship is viewed as a protection in case anything should happen to the person (Musharbash 2008, p.44). One of the co-authors, Go-Sam likewise reports that her extended Dyirbal kin, residing in north Queensland rural towns, go to great lengths to ensure that individual members of the family, particularly females, are not left alone in any circumstances. For example, her widowed 'mother' (actual mother's sister) on returning daily to her house to sleep on the outskirts of town, will take one or several of her grandchildren along. These children will be either instructed, asked or volunteer to keep her company. Accompanying children will stay for undefined periods of time and, if school age, will have some of their required clothing and possessions transferred to their grandmother's house or obtained every morning from their immediate family residence before attending school. This is a common behavioural pattern in other parts of Aboriginal Australia.

Delving back deeper into Australian ethnographic history, a description was prepared by Elkin (1938, pp.69-74) of the traditional forms of socio-spatial behaviour in the Lake Eyre Region, in which he described the following types of behaviour as being exercised between specific pairs of individuals depending on the nature of their kin relation, either actual or classificatory:

- Sitting close to certain relatives was forbidden.
- Visual avoidance was necessary with some types of relatives whilst conversing with them.
- Complete avoidance was necessary with other categories of relatives, both spatial, visual and conversational.
- Bodily contact had to be avoided with one particular type of relative.
- One had to leave one's camp if a person of a particular category entered.
- Camps or activity groups that contained certain kin had to be avoided.
- When sitting in tree shade, individuals had to re-organise their groupings in accordance with 'blood moieties'.[16]

Although these classical socio-spatial rules of Aboriginal Australia may no longer operate in these precise forms, in-depth research in local centres (e.g. Fantin 2003a) indicates that they may have transformed into more generic and broad socio-spatial values and rules which can nevertheless be regarded as traditionally-based behavioural patterns. Memmott (1979) observed that the Lardil at Mornington Island Mission employed mechanisms other than architectural enclosures to achieve desired

[16] See Memmott 1991, Ch.3 for more detail on this technical category.

levels of privacy. These strategies included traditional kinship avoidance behaviour, intra-settlement residential shifts and retreat from settlement to territorial bush camps. Clans and language group divisions had distinct territorial domains. (Memmott 1979, pp.374–5)

Thus in non-remote Aboriginal society, the basis of separation or congregation in analogous settings consists of gender and relatedness (Birdsall-Jones 1990). The larger the group, the more evident the gender-based rules of avoidance versus congregation became. At a large gathering such as a funeral, men and older boys formed one group and women separated from the men into their own group. Younger children ran back and forth between the groups freely. Further observation in the household setting revealed that once children reached mid-adolescence, any contact between opposite gender cousin-siblings was rare.

These examples highlight the importance of a model of crowding not based on density or purely numerical metrics, as such calculations do not take into consideration complex cultural factors such as the strongly enculturated need for company, differing concepts of privacy and physical contact, and kin-specific and gender-specific rules of avoidance or closeness.

4.1.4 Maintaining customary avoidance relationships and spaces

The close juxtaposition of Aboriginal individuals who continue to maintain customary avoidance relationships may cause significant stress. Reser has argued (1976, p.6; 1979, p.86) that the high densities and fixed architectural features of houses in Arnhem Land inhibit the flexibility of such spatial options, especially in inclement weather or at night when many relatives retreat indoors. The resultant constriction of movement is likely to generate some crowding stress of a unique Aboriginal nature (Memmott 1991, p.261).

Fantin's research and architectural design work at Galiwin'ku during 2001–02 as part of the National Aboriginal Health Strategy (NAHS) provides a more recent case in point. The overall objective of the project was to separate the wet area functions away from other functions of the house. As the architect designing the new houses at Galinin'ku, Fantin found it necessary to synthesise the environmental health paradigms with the needs of Aboriginal culture. In particular she needed to find a design that took into account avoidance relationships. When housing design failed to provide ways for avoidance relationships to be observed, the result was behavioural stress and, occasionally, violence (Fantin 2003a, 2003b) (refer to Figure 2).

The main focus of Fantin's study was the overall impact of housing on avoidance behaviour as expressed through the spatial manifestations of avoidance between (a) an adult brother and sister, and (b) a son-in-law and mother-in-law (2003a, pp.180–91). The internal designs of particular houses brought such adults into close spatial or visual contact with one another, and with whom they were culturally required to avoid, causing behavioural stress and at times aggressive displays.

Fantin was able to demonstrate alternate house layout designs to reorganise the distribution of activity and circulation spaces and lines of vision so as to alleviate this problem, which can be analysed as a culturally-specific form of crowding (and one that is independent of high household density in general).

These culturally specific forms of crowding that are possible when cultural norms are not sufficiently considered in housing design draws out the inadequacy of current cross-cultural models of crowding in international literature. In the case of Arnhem Land people their 'contact culture' status can both provide a coping mechanism in traditional camp layouts as identified by Reser, as well as a potential contributing

factor to crowding if housing is not appropriate as demonstrated by Fantin. This aligns with our argument, following Sanders (2008), that it is recognition of difference rather than a focus on so-called equality that is required in the case of resolving issues of crowding.

4.1.5 Accommodating activities in semi-enclosed and outdoor spaces

A distinct norm in many rural and remote regions is to live outside of the house or in semi-enclosed spaces, where people can maintain wider social surveillance and interaction. In relatively fine weather, interior rooms may become relegated to the storage of possessions, and their significance is de-activated. (Musharbash 2008).

Large households will overflow into semi-enclosed and outdoor spaces. Verandah spaces are often used to accommodate both the householders and their daytime or overnight visiting kin. For example, there may be single gender groups who meet and play cards daily at a particular house on the verandah. Many people prefer to socialise and even sleep outside unless this is made too disagreeable by mosquitoes, rain or intoxicated persons. It is important to note that some people will sleep on verandas at night-time, while other people or households will only use verandahs if they are secured with screens for reasons of safety and privacy (Memmott et al. 2000, p.43, p.44).

The continued preference for outdoor spaces may give an impression of crowdedness due to high density, whereas culturally specific norms may be the driver of behaviour rather than 'not enough room'. These cultural factors are seldom stated as relevant to crowding in the literature and warrant further investigation to contribute to the wider and more accurate understanding of crowding.

4.2 Other behavioural responses and values

While we have mentioned the concepts of shame and respect in this Positioning Paper, we have not yet described their significance in the context of household crowding. Shame and respect are important cultural values which occur throughout Australian Aboriginal society. Respect has a dual application in relation to both the self and the other. It applies to the observance of one's own rights by others and correspondingly the injunction that one should respect the rights of those others. Failure to do so is said to be 'shame'. Interestingly, Myers (1986) notes that for the Pintupi, there is one word (*kunta*) for both respect and shame. The meaning of the word is drawn from the context in which it is used. This gives us an important insight into the close relationship between these two concepts in Aboriginal usage.

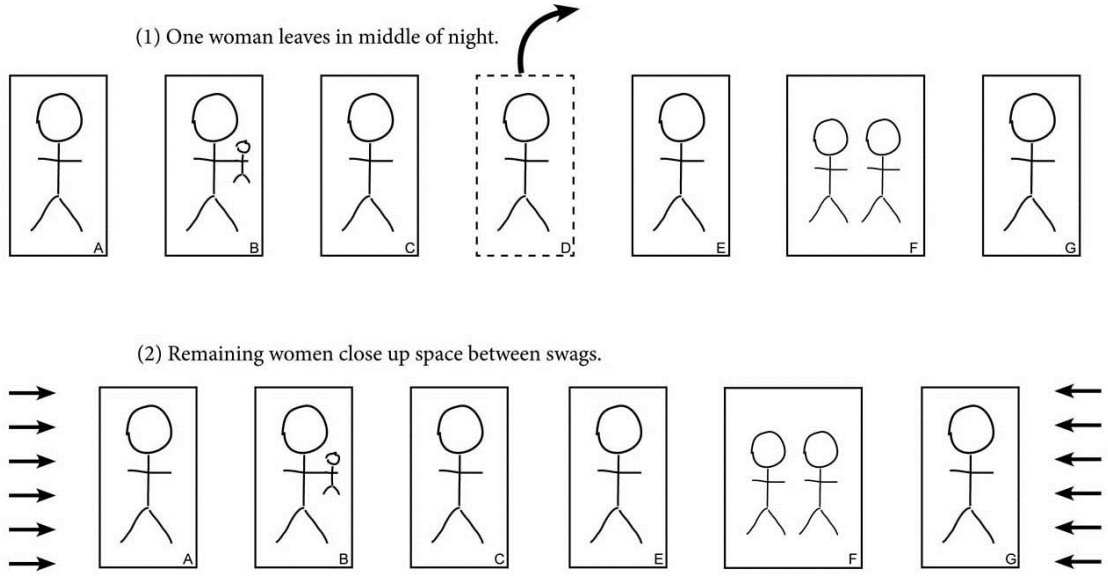
Myers (1986, p.97) discussed the threat to Pintupi social order that may occur during periods of resource scarcity when large numbers of people congregate 'at sites of abundant waters'. During this season, there are no other sources of water and so people lack the 'usual option of moving away should conflicts or disputes arise' (1986, p.97). The concentration of people in larger than the normal group size leads to instances in which people may fail to observe the usual canons governing the privacy of other people's camps as defined by the camp fire and outer refuse zone of their domiciliary spaces. In failing to respect the rights of others in this regard, Myers reported that the transgressor(s) brought shame on themselves by behaving so improperly. As well, they shamed others by failing to respect their rights, in this case the right to privacy. This easily leads to ongoing disputes, and it was recognized as being important to avoid such situations. The concept of shame was inextricably linked to the distinction between 'what is defined as "public" from the "private" '(Myers 1986, p.120).

It is not merely through words that people communicate their respect for others, but also, as Musharbash (2008, p.110) notes regarding Warlpiri people, through the ways in which they position their bodies in respect to the camp and to each other.

> Intimacy, at Yuendumu, means knowing others through understanding (being able to read) how they position their body in the world, and, expressing one's selfhood in the same subtle way … there are specific ways in which Warlpiri people engage through their bodies with domestic space and the world. (Musharbash 2008, p.110)

By 'expressing one's selfhood' in these subtle physical ways, people can communicate visually without infringing the personal space of others within the domestic space. Figure 3 illustrates how Yapa [Aboriginal people] strive for "gap-free" *yunta* [sleeping configurations]' … 'Sleeping alone is an impossibility' (Musharbash 2008, p.44).

Figure 3: Example from Musharbash's description of the Aboriginal value of intimacy in Warlpiri single women's households



Source: Musharbash 2008, p.44

These concepts, shame, respect and intimacy, are operative in non-remote Aboriginal society as well. Just as the scarcity of water for the Pintupi forces them into larger groups which cannot separate because there is no other water, so the scarcity of housing in the non-remote urban setting forces larger groups of people to share housing. Here, too, there is a need to separate what is public from the space that people regard as their private space. There is no other housing, and so people cannot separate into smaller customary household units based on compatible social relationships. According to the authors' research (e.g. in Broome), it is under such conditions that stress will arise and hence a state of genuine crowding.

5 CONCLUDING NOTES

Crowding is a complex field of social analysis, with a state of crowding involving an unaccepted density of persons and dependent on there being perceived stress for its existence. Marked cross-cultural differences are noted in the literature in the varied social manifestations of crowding, but these are currently crudely modelled and require further refinement for a culturally specific understanding of crowding. The Australian literature clearly establishes that traditional Aboriginal crowding behaviours are culturally distinct, in line with international literature which posits crowding as a complex concept requiring further investigation, particularly at the cross-cultural level of analysis.

This analysis of Aboriginal crowding provides a clear research agenda. In the first place little is known about the Aboriginal conceptualisation of household activities. Until this is known, little can be said of crowding (or privacy) in relation to specific activities. Privacy norms concerning ablutions and sexual behaviour have not been discussed in any detail, but from the studies reviewed here we know that they may have an important bearing on architectural design, an issue discussed in Memmott (1979, p.375) and Fantin (2003a).

It is also unclear how cultural change has affected norms of crowding and privacy in urban contexts, and more specifically what has been the impact of housing on such norms. Although we can show that the provision of Western European style housing has wrought change in the way all Australian Aboriginal groups now react to and deal with crowding and privacy, we have not yet demonstrated this through case study analysis. Obviously substantial research is required to fill out the above model in relation to Aboriginal groups with varying histories of change, before any specific design criteria can be developed. In the meantime it certainly cannot be assumed that high household densities regarded as 'crowded' by non-Aboriginal standards are necessarily perceived as being stressful by Aboriginal groups (Memmott 1991, p.262).

Several findings we can state at this point include that the literature clearly indicates that the juxtaposition of inappropriate types of relatives in sleeping and living spaces (thereby breaking avoidance rules) is a salient dimension of Aboriginal crowding which may still well apply in contemporary metropolitan settings. We also find that issues of mobility, power relationships and traditional authority can affect perceptions of crowding in terms of a desire to be away from particular people, at the scale of neighbourhood or town, as discussed in Birdsall-Jones (1990).

Additionally the perception of crowding is only one dimension of appropriate density of household occupants, with the desire for company and sleeping intimacy, as discussed by Musharbash (2008), as driving factors in the use and satisfaction with dwellings.

These initial findings demonstrate the complex and specific nature of crowding in cultural contexts, which requires both further case study analysis and theoretical engagement for a deeper understanding of Aboriginal crowding to be articulated.

Our recent research suggests that Indigenous household crowding has a dual nature. On the one hand a common response mechanism to crowding is the way in which people purposefully designed the behavioural setting of the household in order to achieve a socio-spatial structure of relationships, which affords the best chance of avoiding reactions of shame and jealousy among the residents of a household. There are often rules governing the combinations of people in living and sleeping space which introduce ordered and safe behaviour within the home. The arrangement of people in sleeping space occurs according to combinations based on age, gender,

conjugal status and kin relationships. Such a household may hold, as permanent and semi-permanent residents, a large number of people and yet not be regarded as crowded. The membership of such a rule-governed household is likely to be stable and such households may endure for years. There are limits, however, even for the rule-governed household. A house that is 'full' is one in which there is no means of allocating sleeping space to persons without placing them in situations which compromise the need for respect among kin. Such a situation will bring shame on those directly affected and on those who have responsibility for their kinfolk so shamed. Shame invokes jealousy, and this activates the right of individuals to take action to punish for the transgressions. The household in this situation is overcrowded, loses stability and may not survive.

The other aspect of the dual nature of crowding is the result of householders who may have chosen or adopted a substance-abuse lifestyle. Under these circumstances the primary difficulty is the decreased predictability of the living pattern. Here the home may be said to be crowded not on account of numbers alone but on account of failure of rule-governed behaviour which upholds respect and applies the sanction of shame when respect is contravened (thereby also opening the way for behaviour arising from jealousy). The membership of the substance-abuse household is highly unstable and the household itself may be short-lived. The three aspects of respect, shame and jealousy constitute cornerstones of ethical interpersonal conduct in Aboriginal society. This preliminary model of Aboriginal rule-governed behaviour has been developed by the authors over successive research projects in non-remote research settings.

This is a very different understanding of house crowding from the density model typically used by Australian public housing providers, which in the case of the Canadian National Occupancy Standard (CNOS) definition of crowding, we argue may not even reflect the diverse uses of bedrooms within the Anglo community, and so offers no opportunity of being cross-culturally applicable to Aboriginal communities. Such an understanding conforms to the perceived stress model of crowding which has been used by social scientists for many years in the context of other, different cultures (e.g. the Chinese). A model based primarily on the perception of stress and the importance of social control, rather than simple density, bears a closer resemblance to the realities of Australian Aboriginal household situations. The control of orderly household behaviour is not necessarily open to Aboriginal people if they employ a density model because the demand for housing in many communities exceeds the supply of low-cost public housing. Thus given the high density of many Aboriginal households, the techniques to minimise and avoid crowding include a combination of socio-spatial divisions, observance of avoidance and respect rules, punishing any rule violation with shaming, adjusting spaces where possible with flexible architectural elements and, ultimately, especially under high stress, the deployment of residential mobility within kin networks.

5.1 Policy implications

Since the mainstreaming of Indigenous affairs which began in 2005 with the disbanding of the Aboriginal and Torres Strait Islander Commission, Aboriginal housing policy outside the context of remote area communities has become absorbed within the wider framework of housing policy in general. For example, when the National Partnership agreements were introduced by the Rudd Government in 2008 there was a National Partnership Agreement entered into on remote Indigenous housing (COAG 2008b), with most other Aboriginal housing matters being subsumed in other, generalist, housing agreements. These included the National Partnership Agreement on Affordable Housing (NPAAH) (COAG 2008a) and the National Partnership Agreement on Social Housing (NPASH) (COAG 2009a). There does exist

a strategy statement as part of the Closing the Gap initiative (Closing the Gap: National Urban and Regional Service Delivery Strategy for Indigenous Australians, COAG 2009b); however this strategy statement refers to the NPASH and the NPAH as being among a suite of generalist policies which have imbedded within them the intention to serve the housing needs of Aboriginal people in the towns and cities (COAG 2009b, p.6). In order to discuss the policy implications of our research we therefore turn to one of the primary tools employed by Australian Governments in determining Aboriginal household crowding problems, the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) which makes significant use of the Canadian National Occupancy Standard (CNOS). For example, see the National Affordable Housing Agreement: performance report for 2009–10 at page 48 (COAG Reform Council 2011). By this means, we address the overall understanding of Australian Governments regarding Aboriginal household crowding.

5.1.1 The Canadian National Occupancy Standard and the National Aboriginal Torres Strait Islander Social Survey

Use of the Canadian National Occupancy Standard as a measure of 'crowding' is problematic for government. It is embedded with culturally specific assumptions such as preferable sleeping arrangements of particular genders, relationships, etc. which are not necessarily applicable to Indigenous Australians, but few alternatives have been proposed despite critiques of CNOS.

A key problem then as we have argued elsewhere (Memmott et al. 2011) is that surveys such as the National Aboriginal Torres Strait Islander Social Survey which rely on CNOS are, at best, a snapshot of household sizes and profiles and probably a blurred one due to the under-reporting of visitors. NATSISS does not readily capture flows in and out of households and the various stress-generating pressures that fall on Indigenous households due to such household behaviours. These deficiencies mitigate against an accurate modelling of crowding even though government departments and other agencies persist in extrapolating findings on crowding from the NATSISS data. The complexity we have demonstrated in the perception, mobility, coping mechanisms and culturally-specific drivers of house crowding makes a survey-based density measure as a stand-alone model of crowding only partially helpful. Furthermore, scaling up or extrapolating NATSISS survey results may mask local contextual factors. Caution is therefore counselled concerning the use of NATSISS findings to direct government program expenditure in order to redress housing shortages. It may be that more rich or fine-tuned measures are required, despite the potential cost or complexity of gaining such information. In our view, NATSISS findings are better used as a first step to decision making only, to be followed with more in-depth community surveys or consultation prior to expenditure decisions. Just as health diagnoses cannot be made via a simple survey questionnaire separate from medical practitioners, similarly the complexity of house crowding requires a more in-depth and nuanced 'diagnosis'. We do not doubt that crowding exists and that in many cases it is severe, but the cultural and group-specific nature of the causes of crowding and possible solutions require more investigations than the NATSISS survey data can currently provide.

In addition to improving the NATSISS survey, we make four suggestions (Memmott et al. 2011) on additional research that should be encouraged to obtain complementary findings for those of the NATSISS survey:

- → We suggest in general that there be developed combined quantitative and qualitative methods to better contextualise and model crowding and spatial needs in Aboriginal households.

- More longitudinal case studies should be undertaken so as to understand household dynamics; these to be separate studies to NATSISS, but to complement the NATSISS findings.
- An effective technique needs to be developed to capture flows of people in and out of households.
- More research is needed on the nature of the relationships between core and temporary householders (e.g. is ‘visitor’ an appropriate term? What does it mean to Aboriginal people who are serial or repeated dwellers in a home, do they identify with such a term?).

Finally, there is a need for a new metric to assess Indigenous households and whether they are crowded. A key design issue for such a metric would be the level of complexity and the cost (time involved) of using it. Alternatively we suggest that a statistical algorithm technique be developed to incorporate a ‘visitor factor’ and/or a ‘household mobility factor’ into the NATSISS data weighting process (Memmott et al. 2011).

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AHURI
Australian Housing
and Urban Research Institute

Australian Housing and Urban Research Institute
Level 1, 114 Flinders Street, Melbourne Victoria 3000
Phone +61 3 9660 2300 Fax +61 3 9663 5488
Email information@ahuri.edu.au Web www.ahuri.edu.au