# Examining the impact of Euro-Canadian architecture on Inuit families living in Arctic Canada

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**Abstract**
Recent ethnographic fieldwork in the Canadian Arctic has revealed differences in the patterns of housekeeping practiced by Inuit and Euro-Canadian families. These differences are reflected in the types of activities Inuit families carry out, and how these activities are distributed within houses. The majority of Inuit family activities occur in integrated spaces such as living rooms and kitchens, because daily activities provide an important context for social interaction among family members. The use of space syntax analysis to examine houses built over the past 50 years in the Canadian north indicates a trend towards floor plans with narrow view fields and a greater number of smaller rooms. This trend reflects the increasing importance of individualism and privacy in Euro-Canadian society, and is not compatible with the more collective forms of social interaction that characterize Inuit families. These results should be of importance to architects and planners interested in designing and building houses that better reflect the cultural values and lifestyles of Inuit families.

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## Introduction

Life in an Inuit community does not parallel life in southern Canada. Daily activities like hunting, fishing, the upkeep of rifles, fishing nets, snow machines, as well as family values, and entertaining and visiting habits define cultural values that differ considerably from those of Euro-Canadian society. Yet, since the 1950s, northern housing policy and urban planning have focused primarily on providing cost-effective, durable Euro-Canadian style houses and efficiently serviced communities to Inuit peoples. The unique economic and cultural configurations of Inuit families have been largely left out of the design and planning process. As a result, we might expect the patterns of housekeeping practiced by Inuit families to differ radically from those of their Euro-Canadian counterparts. This seems to have been the case 30 years ago, when several studies were initiated by Canadian Federal Government agencies to examine how the switch to western housing had impacted on Inuit family life. At the time, fieldworkers documented families butchering animals in living rooms, storing seal meat in bathtubs, drum dancing in living rooms, and using kitchens

to repair engines and firearms. But is this still the case today? Do Inuit families continue to graft their unique activities and cultural values spatially onto the Euro-Canadian style houses they currently occupy? And, if so, then what affect has this had on domestic life, social interactions among friends and family members, and the adequacy and durability of northern housing? Can new design principles be developed from the documentation of such differences that could assist in designing future houses that better reflect the lifestyles and cultural values of Inuit families?

The objective of this paper is to examine these important questions through space syntax analysis and the results of field research conducted in the Inuit hamlet of Arviat, Nunavut, during the summer of 2002. Observations of the domestic activities of Inuit families were mapped onto the floor plans of northern houses. Space syntax analysis was then used to analyze and interpret these observations. A relational database of information on space use by Inuit families was also constructed using Microsoft Access to serve as a decision-support system for architects and planners working in the Canadian north. Results indicate that Inuit families differ from Euro-Canadian families in both the types of domestic activities they engage in, and how these activities are distributed within the house. The observational approach used in this project could be considered as a form of Inuit *Qaujimajatuqangit* (knowledge of all areas of life) because it provides Inuit families with a means of "educating" architects and planners about the spatial requirements of their unique activities and cultural values.



**Background: Housing in Canadian Arctic Communities**

Inadequate housing has been recognized as a critical issue by both Inuit political organizations (McEwen, 1976) and the Canadian Federal Government (Williamson, 1996). Overcrowding, structural engineering problems, and the high cost of delivering and maintaining housing in northern regions are among the most pressing concerns. The results of a 1991 Aboriginal Peoples Survey released by Statistics Canada, for example, reveal that the number of occupants living in an average Inuit house is more than twice the national average. Furthermore, climatic factors, poor construction, and overcrowding usually limit the life expectancy of houses in the arctic to only five or six years (Williamson, 1996:22). Often overlooked is the issue of how well the designs of current northern housing stocks suit the activities, cultural values, and lifestyles of contemporary Inuit families. Collectively, many reports on northern housing acknowledge that family size and structure, daily patterns of activity inside and outside the house, entertaining and visiting habits, shared community activities, activities allocated to different rooms, and the time spent on various activities inevitably differ between Inuit and Euro-Canadian families (Inuit Non-Profit Housing Corporation, 1984). The recommendations which follow usually outline the need

for Inuit involvement in the design process (Inuit Non-Profit Housing Corporation, 1984: 5). Despite these recommendations, a long term, systematic study of Inuit spatial behavior in Euro-Canadian style houses has yet to be initiated in the Canadian Arctic. This is regrettable, given that a survey of the literature on northern housing issues reveals that the cultural incompatibility between Euro-Canadian house designs and Inuit culture clearly contribute to such problems as overcrowding and the short life expectancy of housing stock. To illustrate, while traditional Inuit houses were designed to accommodate extended families, the principal social unit in Inuit society, Euro-Canadian houses were designed around the concept of single nuclear families (Balikci, 1964; Damas, 1969a,b; Miron, 1988). Consequently, in the early days of social housing programs in the north, the desire for kin to live together often contributed to overcrowded conditions (Pauktuutit Inuit Women's Association, 1984). Likewise, traditional Inuit food preparation commonly involved boiling, which led to exceedingly high levels of condensation that the building systems of Euro-Canadian houses were not designed to accommodate. This resulted in the icing of windows and the warping of floors and walls (Bruce, 1969: 6). Finally, the segmentation of open areas into spaces with specific functions such as bedrooms, living rooms, and kitchens often made it difficult to engage in traditional activities like animal butchering, hide preparation, and the repair and maintenance of hunting equipment (Thomas and Thompson, 1972). In the 1960s, the use of living room floors for the dressing of game and bathtubs for the storage of meat created unsanitary conditions that placed the health of families at risk (Thomas and Thompson, 1972).



At present, little but anecdotal information exists on the degree to which Inuit families currently engage in traditional activities within their homes. Consequently, an updated study of the patterns of housekeeping practiced by Inuit families is warranted, given that current research by Wenzel (1995), Freeman et al. (1992) and others indicate that traditional activities relating to the procurement, sharing, and consumption of food continue to be of cultural importance to most households (Figure 1) Recent developments in the analysis of domestic space using computer modeling offer a new and innovative avenue for exploring these issues.

**Figure 1: Hunting caribou on the edges of the community of Arviat, Nunavut**

**Background: The spatial analysis of domestic architecture**

In 1984, Hillier and Hanson published *The Social Logic of Space* in which they outlined a syntactic theory for the organization of space in buildings and settlements. They argued that buildings, towns, and cities have particular spatial properties that translate into sociological rules which affect where activities are situated and how people relate to one another. Within this framework, the spatial configuration of a dwelling or settlement is believed to present a fairly precise map of the economic, social, and ideological relations of its intended inhabitants (Hanson, 1998: 13). Over the past 18 years, the theory and method of space syntax has undergone a great deal of development. This has been due largely to three factors: the application of space syntax to a wider range of building and settlement types (Hillier, 1996; Hanson, 1994, 1998; Peponis et al., 1997, etc), the development of sophisticated computer software that has allowed researchers to numerically capture differences in the configuration of spaces and compare them with observed frequencies of space use (Penn et al., 1998; Turner et al., 2001, etc.), and the organization of three international symposia on space syntax research (2002, 1999, 1997).



Results indicate that "integration" is a powerful predictor for how "busy" or how "quiet" a space will be (Hanson, 1998: 10). Integration is a normalized (inverse) measure of the mean shortest path from one point to all other points in a building. Spaces are usually connected together in ways that affect how integration is distributed throughout the structure, making some areas of a dwelling more accessible and/or visible than others. This sequencing of integration serves to regulate interactions among inhabitants, and spatially separate activities which might be deemed incompatible because of their mechanical properties (e.g., noisy/messy versus quiet/clean) and social context (e.g. individual versus communal, private versus public). For example, households that maintain sex-specific and mono-functional activity areas tend to segment and compartmentalize them in space, thereby re-enforcing attitudes regarding sexual division of labor, individuality, and a need to keep various activities with incompatible mechanical properties ordered and separated (Kent, 1986: 196-97). This often results in houses with many rooms that vary according to integration. In contrast, households where different activities are conducted by the same individuals tend to unify such activities in space (Kent, 1986: 204). Under these circumstances, households are usually far more tolerant of "lumping" activities with different mechanical properties together in the same spatial location (Kent, 1986: 204). As a result, the dwellings occupied by such households are often characterized by more open and accessible floor plans with integration values that are roughly equivalent. It therefore seems logical that how integration is distributed within a dwelling becomes an important means of determining how culture is conveyed through architecture (Hanson, 1998: 32).

A measure of relative asymmetry can be calculated to measure and map integration within the spatial configuration of a dwelling. This provides the researcher with a numerical means of comparing the configurational descriptions of different types of structures (Hiller and Hanson, 1984: 108-140; Hanson, 1998: 23). Relative asymmetry is expressed mathematically in the following equation:

$$RA = \frac{2(MD - 1)}{k - 2}$$

The mean depth (MD) of each space is calculated by assigning every other space a depth value, based on the trip lengths taken to move from the current space to all others in the dwelling. These trip lengths are then summed and divided by the total number of spaces (k) in the house less one (the current space). Once the mean depth is determined, relative asymmetry is calculated using the equation. Because RA values differ considerably across dwellings of different sizes, it is necessary to convert them into a measure of real relative asymmetry (RRA) using a constant provided by Hillier and Hanson (1984: 112). The resulting RRA values are either greater than or less than 1, with higher values indicating more asymmetry or differences in spatial accessibility. RRA values can be rapidly calculated from justified permeability maps created using Netbox, and graphically displayed using Pesh - two computer programs developed specifically for space syntax research.



**Observations of space use in the Inuit community of Arviat, Nunavut**

In the first section of this paper, I argue that Euro-Canadian and Inuit families practice fundamentally different types of household activities. These activities are also infused with different cultural attitudes relating to spatial separation, order, and the number of participants. If the way in which integration is distributed within the spatial configuration of a house is the primary means by which culture is conveyed through architecture, then the floor plans of Euro-Canadian houses are likely incompatible with the activities and cultural values of Inuit families (Figure 2).

**Figure 2: A typical house in Arviat, Nunavut**

In order to test this hypothesis, surveys of the spatial distribution of domestic activities within 47 Inuit households were made using the "static snapshot" method of observation. Using this technique, the observer walks from room to room within the dwelling and takes a mental snapshot and digital photograph of all moving and stationary activities that are occurring at that moment. The snapshot is then recorded on a plan view of the house, with coding according to the activity. The standard categories which were measured are listed in Table 1. Snap-shot observations were taken at various times throughout the day; for example, meal times, mid-morning, mid-afternoon, and mid-evening. Observations were recorded over a period of two months during the summer of 2002. The recruitment of households was conducted on a volunteer basis. Families were approached informally and asked to participate in the study. The observations and snapshots collected were then used to construct a relational database of space use by Inuit families using Microsoft Access. The categories used in the relational database include: house address, house model, number of bedrooms, all activities observed during the time of the visit, where they occurred within the house, and a photo reference number for digital images of the domestic activities recorded. Integration values were next assigned to each activity using the value calculated for the room in which it was most frequently observed.



**Table 1. Categories and Subcategories of Domestic Activity**

| | |
|---|---|
| Cooking | a) Char |
| | b) Caribou |
| | c) Seal |
| | d) Beluga |
| | e) Bear |
| | f) Narwhal |
| | g) Bannock |
| | h) Cooking Marrow |
| | i) Northern Store Food |
| | j) Miscellaneous Country Food |
| Hunting/Fishing | a) Butchering Animals |
| | b) Cleaning Char |
| | c) Drying Char |
| | d) Preparing Hides |
| | e) Making Dry Meat |
| | f) Splitting Bone for Marrow |
| Sewing | a) Hide |
| | b) Cloth |
| Crafts | a) Carving |
| | b) Jewelry |
| | c) Wall Hangings |
| | d) Doll Making |
| | e) Miscellaneous |
| Maintenance | a) Honda |
| | b) Snow Machine |
| | c) Boat |
| | d) Fishing Nets |
| | e) Rifle |
| | f) Komatiks (Sleds) |
| | g) Miscellaneous |
| Eating | a) Caribou Meat |
| | b) Dried Caribou Meat |
| | c) Char |
| | d) Dried Char |
| | e) Beluga |
| | f) Narwhal |
| | g) Bannock |
| | h) Country Food |
| | i) Tea/Coffee |
| | j) Store-bought food |
| Storing | a) Hides/Hide Clothing |
| | b) Store Bought Clothing |
| | c) Hunting Equipment |
| | d) Sewing Equipment |
| | e) Tools |
| | f) Toys |
| | g) Caribou Meat |
| | h) Char |
| | i) Bird Eggs |
| | j) Sea Mammal |
| | k) Northern store food |
| | l) Large Cooking Pots |
| | m) Misc |
| Socializing | a) Watching TV |
| | b) Playing with Children. |
| | c) Visiting with Family and Friends |
| | d) Eating Country Food with Family |
| | e) Talking on CB Radio |
| | f) Listening to Radio Station |
| | g) Smoking/Chewing Tobacco |
| | h) Drum Dancing* |
| Personal Needs | a) Sleeping |
| | b) Washing Up |
| | c) Brushing Teeth |
| | d) Laundry |
| Other | a) Using Computer |
| | b) Operating Small Business |

**Configurational descriptions of Euro-Canadian architecture in Arviat**

Space syntax analysis was then used to generate configurational descriptions of the house designs currently used in Arviat. These configurational descriptions provide a means of mapping how integration is distributed within the dwelling according to the accessibility and visibility of each space.

Justified permeability (JP) graphs for the various house models occupied by the Inuit families participating in this study were first constructed so that integration values for each room could be obtained. In these graphs, rooms are represented as circles, and points of access such as corridors and doorways are represented as lines. The graphs provide a visual means of examining how different house models vary in the ways that spaces are connected together. For example, graphs such as the Coldstream 3-bedroom house (Figure 3a) are longer (deeper) and narrower (non-distributed) than graphs such as the Access 4-bedroom house (Figure 3b) which are shorter (shallower) and wider (distributed). Integration is sequenced differently in the Coldstream house because integration values vary to a much greater degree. This is due to the fact that there are fewer rooms occupying similar positions in the configuration, as is the case with the Access house in which eight rooms all occur at the same depth, and are connected to the same space.



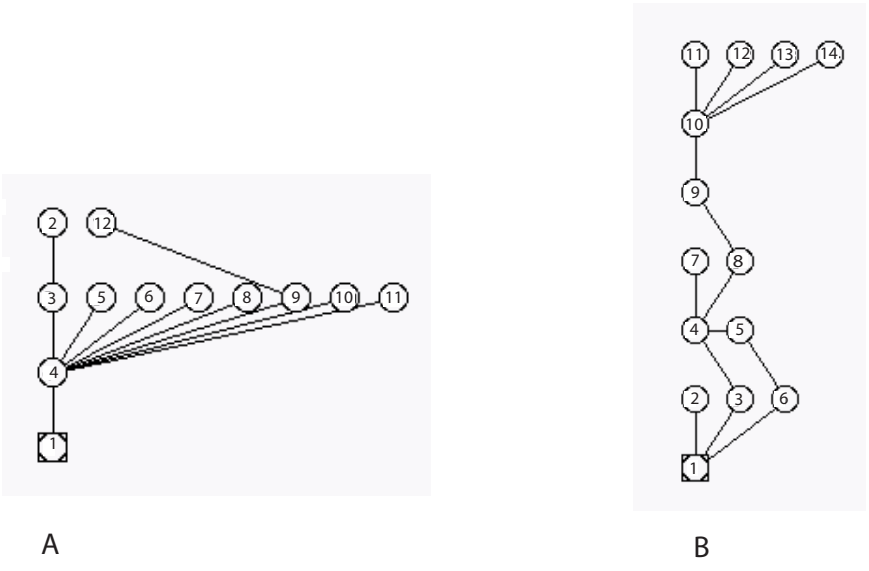



**Figure 3a, b: Justified permeability (JP) maps of an Access 4 bedroom house (a) and a Coldstream 3 bedroom house (b)**

2D convex analysis offers a more visual means of examining the sequencing of integration. The floor plans of each house model used in the study were broken up into discrete bounded spaces (rooms) that are connected together by points of entrance and exit (Figures 4a, b). The connections between spaces were then processed using Pesh software and toned according to their integration values: from

dark (most integrated) along a scale of grey to white (least integrated). Like the JP graphs, the processed convex break-ups in Figures 5a and 5b also reveal that the integration values of rooms differ across various house models. For example, while living rooms are dark black (highly integrated) in some houses, they appear light grey (less integrated) in others. These differences are a direct function of the different positions these rooms occupy within the overall spatial configuration of the house.



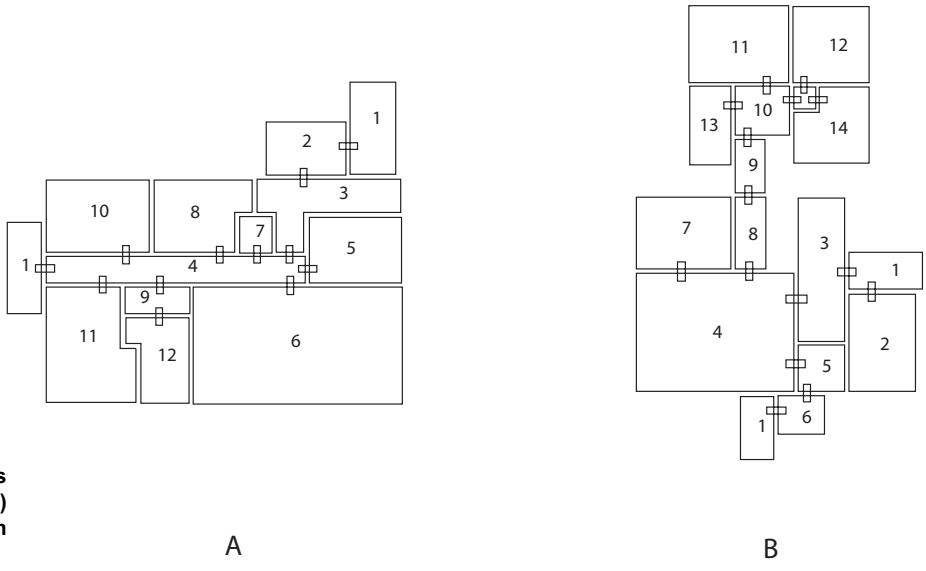



**Figure 4a, b: Convex break-ups of an Access 4 bedroom house (a) and a Coldstream 3 bedroom house (b)**

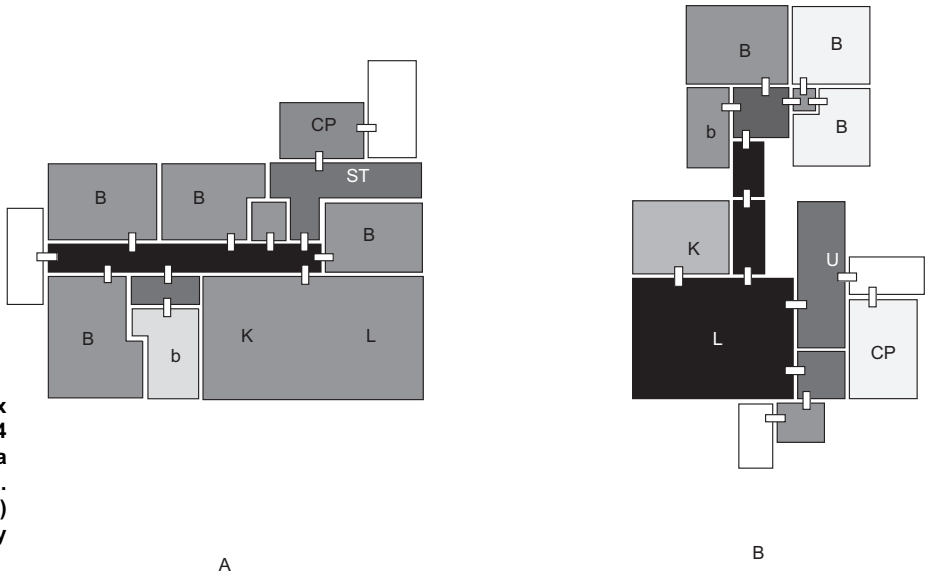



**Figure 5a, b: Processed convex break-ups of an Access 4 bedroom house (a) and a Coldstream 3 bedroom house (b). (L) living room, (B) bedroom, (C) cold porch, (K) kitchen, (U) utility room, (ST) storage room**

**Results of the analysis: The sequencing of activities by integration value**

The locations of activities performed by Inuit families were next transposed onto the processed floor plans. This provided a method of understanding how activities were sequenced within the house according to the integration values of the rooms in which they were most frequently observed.

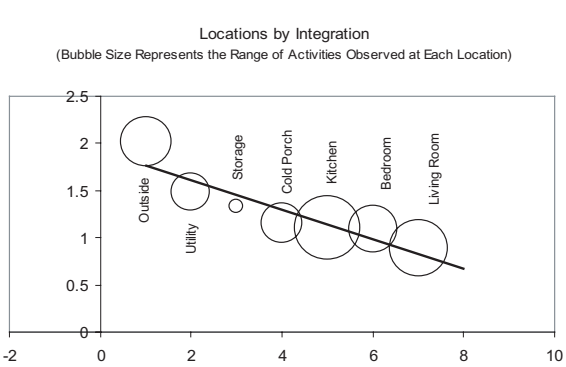



**Figure 6: The sequencing of rooms according to integration**

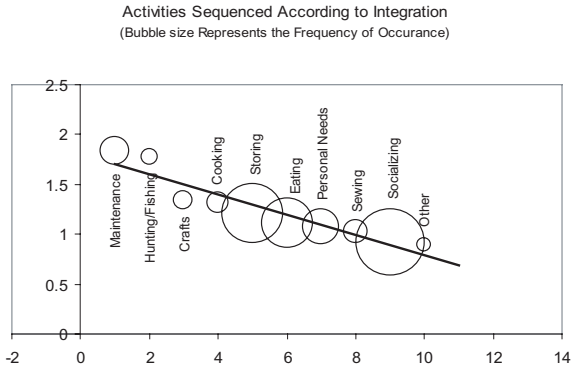



**Figure 7: The sequences of household activities by integration**

In Figure 6 the integration values for seven rooms were averaged across the sample of houses and plotted on an XY graph. The size of each bubble corresponds with the range of domestic activities that were observed at each location. The graph reveals that, on average, living rooms are the most integrated spaces among these houses, followed by bedrooms, kitchens, cold porches[1], storage rooms, and utility rooms. Furthermore, kitchens were associated with the greatest diversity or range of activities, followed by living rooms, then areas outside the house, bedrooms, cold porches, utility rooms and storage rooms.



The domestic activities of each Inuit family were then organized into the following ten categories: cooking; hunting/fishing; sewing; crafts; maintenance; eating; storing; socializing; personal needs; and a generic "other" category. Each of these categories is comprised of different sub-categories which define specific activities. These categories and sub-categories are listed in Table 1. Figure 7 presents the activities of Inuit families sequenced according to the averaged integration values of the rooms in which they were most frequently observed. The size of the bubble represents the number of times each type of activity was observed during the course of the study. The XY graph reveals that socializing activities tend to occur in the most integrated spaces in the dwelling, and were also the most frequently occurring activity. Activities involving the sewing of hide and cloth tended to occur in the next most integrated spaces, followed by personal needs, eating, storing, cooking, crafts, hunting/fishing, and maintenance activities. Does this sequencing of activities reflect the mechanical properties and social contexts that are unique to Inuit household activities, many of which have no direct Euro-Canadian parallel? And if so, how compatible are they with the spatial configurations of Euro-Canadian architecture?

**The sequencing of household activities by integration**

Socializing activities such as visiting with family/friends and eating traditional food with family members have mechanical properties that require large open areas, and a broad social context that involves small to large groups of people. As a result, it is

logical that they would be performed in the living room, which is the most integrated space in the house. Socializing was also the most frequently observed category of activity. This observation correlates with the importance placed in Inuit society on maintaining familial ties and networks of mutual assistance through face-to-face contact. Because of high unemployment in the community, many family members share food, hunting equipment, and labor through kinship and marriage ties. Socializing activities provide a means of re-affirming such ties, as well as accessing information on hunting and fishing activities.

Sewing, on the other hand, is an activity that requires large work spaces because of the use of specialized equipment like sewing machines, surgers and work benches. It is also an activity that occurs within a narrow social context because it requires a great degree of concentration. The fact that it was often observed in relatively integrated spaces is likely a function of the lack of adequate space available for this activity. As a result, it is frequently done opportunistically whenever and wherever it can be accommodated. This may also explain why it was so infrequently observed.



In some cases, the occurrence of personal needs activities such as sleeping in integrated areas like living rooms is a direct reflection of cultural values in Inuit society which stress the solidarity of the family. Observations of family members sleeping in the living rooms of their houses, either individually or together as a unit, were quite common. In many houses it was not unusual to see one or two mattresses on the living room floor. A number of reasons were given for this practice. Some families simply expressed a preference for sleeping together. As one consultant explained to me, “Inuit families are stronger than southern ones”, and because of this, her own family had slept together in a single room when her children were younger. Now that her daughters have grown up, they continue this practice with their own children. Living rooms are ideally suited to this purpose because they are typically the largest spaces in the house. Other Inuit explained to me that second-floor bedrooms in two-story houses were often too hot in the summer, making the first-floor living room a much cooler place to sleep. In general, the sleeping arrangements of the Inuit families I visited were much more flexible than those of a Euro-Canadian family. For example, there might be times when families would sleep together in a single spatial location, and other times when they would sleep in separate rooms either alone or in combination (i.e., mothers sleeping with young children).

Outside of the consumption of traditional foods during family gatherings, eating activities occurred in areas that were midway between integration and segregation. This may be due to the fact that food is consumed whenever one is

hungry and in a variety of locations throughout the house, resulting in a wide range of integration values for this activity. The same can also be said for storing activities. A reliance on a hunting and gathering economy, coupled with overcrowded housing conditions, means that storage space is always at a premium. As a result, items are constantly being stored, removed for use, and restored throughout the house, resulting in a wide range of integration values for this activity.

The cooking of both traditional and non-traditional food requires specialized equipment such as large pots, stoves or open fires, large cutting surfaces, and so on. Furthermore, the mechanical properties of cooking make it a messy activity that often requires large work spaces. Cooking is also an activity that occurs within a relatively narrow social context as it demands frequent attention, and can result in heat and/or smells that others sometimes find distasteful. The boiling of caribou meat over open fires to avoid condensation in houses and high electrical bills[2], and the cooking of bannock in cold porches because children dislike the smell, are two documented examples of this. Consequently, the occurrence of cooking in more segregated areas is likely a reflection of such properties. Traditional foods also tend to be cooked in large batches or eaten fresh (raw) thereby concentrating or reducing overall preparation time. This probably explains why cooking activities were infrequently observed relative to other types of activities like eating.



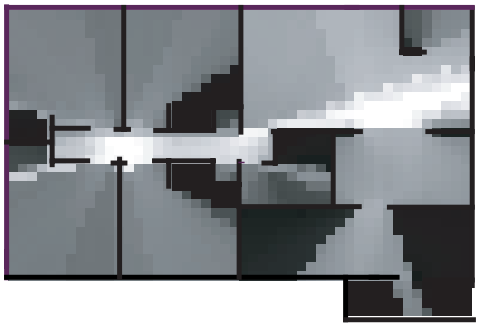
The mechanical properties of craft-making activity such as carving also make them noisy, messy activities. Carving requires a fair amount of space, utilizes specialized and noisy equipment, and generates a large amount of dust and debris. It is also an activity that occurs within a narrow social context because it requires attentiveness and concentration. These factors likely explain why this activity is commonly situated in segregated spaces.

Like crafts, hunting/fishing activities and maintenance activities also require large amounts of work space, specialized equipment, and are often noisy and messy tasks. Not surprisingly, these types of activities tend to be situated outside of the house, either in a work shed or the open air. Hunting/fishing and maintenance activities were not as frequently observed relative to other types of activities because they were usually dependant upon weather, as well as access to the labor and tools of others. As a result, they tended to be performed on an opportunistic and random basis.

Visibility Graph Analysis and Changes in Arctic House Designs through Time
Space syntax analysis was also used to examine how house designs in the Canadian arctic have changed over the last 30 years. Visibility graph analysis provides a means

of examining how integration is distributed within a dwelling according to how visible the interiors of rooms are from different points in the house. The more visible a room interior is, the more integrated the space. Visibility often mediates where certain types of activities take place within the house because rooms that are less visible are usually used for activities that are considered more private and personal than rooms which are more visible to other family members. Consequently, by examining how the view field widens and narrows as one moves through a building, one is able examine how notions of public and private are reflected in the spatial organization of the dwelling. Traditionally, Inuit house forms such as snow houses and caribou skin tents were characterized by open floor plans which lacked interior partitioning. The same is also true for early Euro-Canadian house designs like the one-room "match-box" houses of the 1950s and 1960s. While visibility graph analysis of house models used in Arviat is ongoing, preliminary results indicate that the view fields have narrowed with the introduction of multi-story houses, as well as houses with greater numbers of smaller rooms. Figure 8 presents a visibility graph for two houses: the model 436 built in the 1960's and the Weber built in the late 1970's. Notice how the floor plan of the 436 house generates view fields that are much wider and panoramic than the view fields of the Weber.





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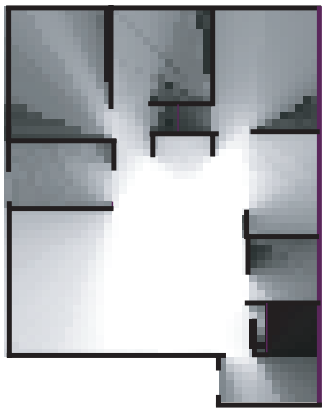

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**Figure 8: Visibility graphs constructed for two house models used in Arviat: the 436 (1960s) and the Weber (1970s)**

The trend towards the construction of houses with more compartmentalized or subdivided floor plans is also reflected in the depths and total integration (RRA) values calculated for houses constructed over the last 30 years. Figure 9 indicates that the distance from the point of entrance to the most recessed or deepest space in the house has increased through time. Likewise, Figure 10 reveals that the total RRA values of houses have also increased, indicating greater numbers of rooms with more varied integration values through time. These changes likely reflect the rising importance of individualism and personal privacy within Euro-Canadian families since the 1950s. To illustrate, when entering the house of a Euro-Canadian family in the south, it is often unusual to see more than two people in any single room at any given time. Instead, family members distribute themselves throughout the house, only coming together (if at all) for activities such as meals in the kitchen. Indeed, individuality and privacy have become highly prized in western societies as a whole, and it is only logical that these cultural values would be expressed spatially in the floor plans of Euro-Canadian houses.



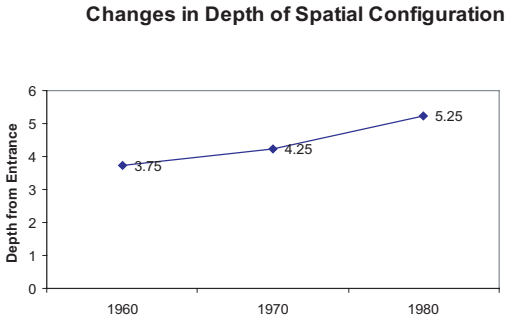


**Figure 9: Changes in house depth over a period of 30 years**

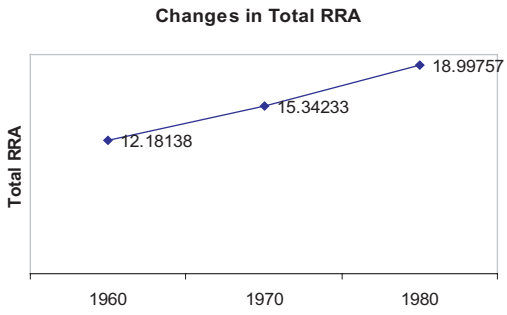


**Figure 10: Changes in total real relative asymmetry (RRA) over the past 30 years**

In contrast, Inuit families place a much higher value on solidarity within the extended family. Activities often involve many people because they serve as important mechanisms for socializing and maintaining contact with other family members. In addition, many different kinds of activities are often situated in the same location. The analysis completed thus far indicates that most activities which take place in the house do so in the most integrated spaces. It would therefore seem as though Inuit families are generally far more tolerant of "lumping" together different types of activities in single spatial locations than Euro-Canadian families, who tend to distribute domestic activities within their homes in a much more dispersed fashion.

**Modifications made by Inuit residents to their houses**

The inadequacies of current northern house designs meeting the needs of Inuit families are further illustrated by some of the modifications Inuit have made to their houses in order to make them more livable. One individual in particular had made a number of innovative changes which he believed made his house more safe, user-friendly, and cost-effective. These modifications included the following:

1. In order to save money on heating bills, he placed skirting around the base of his house, leaving the south side open so that the warmer southern winds travel under the house.

2. He selected a rocky location for the construction of his house in order to minimize the shifting of the foundation and subsequent need to periodically level the house.

3. In the winter, he piles snow up against the side of his house high enough so that it insulates the dead air space under the house.



4. He devised an innovative door locking system that allows his family to leave the house quickly in case of fire.

5. He has replaced the standard front door handle with a heavy duty industrial handle, and spring loaded the door with bungee cords so that it closes automatically. Prior to this, the constant stream of visitors to and from his house resulted in the door being left open, thereby increasing his heating bills.

6. He replaced the 5 gallon toilet he and his family use with a foot peddle version which uses less water, thereby saving on utility costs.

7. He spent $500.00 on linoleum which he fastened to the lower portions of the walls of his house to prevent damage caused by the scratching and drawing of children.

8. The L-shaped layout of the kitchen and living room prevented people in one area observing the activities of people in the other. In order to solve this problem, the resident suspended a parabolic surveillance mirror on a wall that increased what could be seen from the perspective of both spaces.

Many of these modifications were designed to save the family money which was desperately needed to pay for gas, ammunition, and other items necessary for traditional activities like hunting and fishing.

**Summary and conclusions**

The results of this study reveal that the domestic activities of Inuit families in Arviat continue to differ from those of southern Euro-Canadian families because of different cultural values which emphasize the solidarity of the family unit, networks of mutual assistance, and participation in and reliance on a land-based economy. Furthermore, when these activities are sequenced according to integration, Inuit families spatially

distribute their activities differently than Euro-Canadian families. While Inuit families concentrate a wide range of activities in a few highly integrated spatial locations, the activities of Euro-Canadian families are more widely dispersed throughout the house. This seems to reflect different cultural values relating to the separation, ordering, and organization of activities. Given that activities are also used as opportunities for socializing, the patterning of household activities by Inuit families also likely represents different cultural attitudes towards individuality, family solidarity, and the importance of privacy.

Over the past 30 years, houses built in the north have become increasingly sub-divided, resulting in more rooms with a greater range of accessibility, and a narrowing of view fields limiting what can be seen from any given location. Consequently, these changes in spatial configuration would seem to be incompatible with the field observations of space use summarized above. Put another way, Inuit families and Euro-Canadian architecture would seem to be moving in opposite directions, with the former emphasizing social integration while the latter emphasizes spatial segregation. The effect of this is that the spatial configuration of Euro-Canadian houses often makes Inuit household activities difficult to organize, execute and complete. Throughout the study, Inuit families continually voiced their dissatisfaction and frustration with their houses. Individuals commented on small room sizes, lack of adequate storage space, a dislike of two-story house designs, and construction practices that do not stand up to the rigors of life in the Canadian arctic.



Future research will focus on expanding the use of visibility graph analysis to examine a wider range of house types used in the Canadian arctic. In addition, the results of this project will be used to assist in the development of new design criteria in a collaborative effort between the Department of Archaeology and the Faculty of Environmental Design at the University of Calgary. Hopefully, this will lead to the creation of new house designs that better reflect the cultural values and lifestyles of Inuit families currently living in Nunavut.

**Notes:**

1 Cold porches are vestibules that are added to the front porches of houses in Canadian arctic communities. They serve as important spaces for the storage of skin clothing, hunting equipment, and various household items.

2 The small heating elements of the electrical stoves provided to Inuit families are too small to accommodate the large pots used to boil caribou meat. As a result, it takes many hours to boil caribou meat, resulting in high electrical bills.

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