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Patterns of Urban Residential Settlement Among Canada's First Nations Peoples

There is a long tradition of research into residential settlement patterns in North American sociology. Much of the impetus for this research comes from the Chicago School that focussed on the ecological patterns of urban settlement of immigrants in America's large cities in the early Twentieth Century. That research broadened, especially after World War II, when the United States experienced high rates of internal migration. Sociologists conducted similar research in Canada but to a lesser extent. In both the United States and Canada, however, almost none of that research has focussed on the indigenous population. The settlement dynamic of First Nations peoples in urban areas is of particular interest in the Canadian context as we have seen both a revitalization of reserves (First Nations communities) and an apparent increase in movement to urban centres.

Recent research suggests that, while the First Nations populations on reserves have been growing at rates faster than the general Canadian population, the number of Canadians declaring themselves as Aboriginal has been increasing in the urban areas at even faster rates. In 1951 only 7% of the Aboriginal population lived in an urban area (more than 1,000 persons) while the 1991 census shows that 42% of those defined as single origin North American Indians are in such communities (Statistics Canada, 1991 Census, Cat.93-340, Table 1; Drost et al., 1995:13). Despite this geographic shift, there has been little analysis done on either the living patterns of urban Aboriginals or the socioeconomic characteristics of this population. Consequently, we lack information on some very basic questions. For example, with whom are Aboriginal Canadians most likely to share neighbourhoods? Are these neighbourhoods diverse or homogeneous in terms of their social and economic conditions?

This study explores these important issues by addressing three basic questions:

- Is there empirical evidence of urban concentrations among Aboriginal Canadians and, if there is, are these concentrations any greater or lesser than any other group?
- Are the neighbourhoods in which Aboriginal people live diverse in comparison with other

identifiable ethnic groups?

- What, if any, are the socioeconomic conditions that correlate with the areas of Aboriginal residential concentration?

Much of the research into urban residential patterns is of American origin, so generalizing from these studies is difficult since the patterns of settlement in the United States and Canada appear to be quite different (Fong, 1996). American cities remain highly segregated by race, particularly regarding African and Asian-Americans; the situation is not as pronounced in Canada. For example, Wolf (1992) writes, "we should note here that there has been interesting and important caveats placed on any use of the American Cities as comparators to Canadian ones. The argument is that one should recognize that Canadian Cities have less sprawl measured as greater densities and the core of Canadian cities differ from the decayed centres that characterize US metropolitan areas and with the exception of Regent Park in Toronto and Jean Mance in Montreal the affordable housing policy in Canada has avoided high rise concentrations of public housing."

Although the research into residential segregation in Canada is not insignificant (Balakrishnan 1976; 1982; Balakrishnan and Hou, 1995; Balakrishnan and Krault, 1987; Bourne, Baker, Kalbach, Cressman, and Green, 1986; Darroch and Marston, 1971; Kalbach, 1987) most of it is directed toward the comparison of residential patterns among Canadians of European origin. Some of the more recent studies do highlight issues relating to visible minorities (Balakrishnan and Hou, 1995; Balakrishnan and Krault, 1987) but, again, little attention is focussed on people of First Nations ancestry.

Because of their unique status as the original occupants of Canada, and the often less than accepting view of non Aboriginal Canadians, many standard models of residential settlement do not apply to Aboriginal peoples. In the past, and perhaps even now, the urban settlement of Aboriginal people is often seen as a social *problem*. The solution to the "urban Indian problem" for many majority Canadians has been to encourage Aboriginal peoples to "move back to the reserves." Consequently, many observers viewed urban residence for much of the Aboriginal population as temporary, at best. Some saw "urban Indians" as posing a threat to the city itself (Reiber, Kremers 1977:1). Ironically, but consistent with this view, the Saskatchewan government once went as far

as to place the blame for inner-city discrimination squarely on the shoulders of urban Aboriginals. This attitude was supported by the notion that Indian culture is incompatible with city life. A lack of urban culture, high levels of poverty and reduced education supposedly put Indians in league with the urban poor, leading to a high demand for social services and a clustering of housing in lower status neighbourhoods.

As Balakrishnan and Krault (1987: 139) suggest, residential concentration may occur for many reasons. On the one hand, voluntary segregation takes place when groups of people of similar ancestry choose to live close to one another to maximize social interaction. Close physical proximity often helps to foster or maintain social institutions, such as ethnic clubs, schools, stores or churches, and to foster the maintenance of group norms and values. Worldwide, cohesive neighbourhoods such as "Chinatown," "Little Italy," or "Greektown" are seen as positive ethnic enclaves that contribute as much to the broader society as to the specific ethnic communities that they comprise. This wish to form cohesive co-ethnic neighbourhoods is known as the "cultural proximity model."

For many groups, a unique cultural heritage is easier to maintain through ethnic residential concentration than when the group is more broadly dispersed throughout the community. Economic drivers may also result in voluntary concentration. If one is a migrant (either internal or external), it is often easier to find suitable housing and work opportunities by moving to a neighbourhood where friends, relatives and compatriots reside. Research also suggests that ethnic entrepreneurship is assisted through the existence of a cohesive and centralized ethnic market. Some researchers see ethnic enclaves as incubators that allow small businesses to develop during their formative years. The unique aspects of ethnic communities, such as language and culturally determined tastes and preferences serve to insulate small ethnic businesses from larger and more established enterprises. Once past the development stage, these businesses can use the ethnic community as a springboard for expansion into the larger marketplace.

Much of the literature on ethnic mobility suggests a common model for many groups that migrate; they initially find lodging in neighbourhoods of co-ethnics. With time, however, most ethnic groups achieve economic, social, and geographic mobility and integrate, in varying degrees, into the larger mainstream community. This pattern also exists beyond traditional definitions of "ethnicity." Similar patterns appear with indigenous internal migrants when people move from one locality to

another. For example, we would expect to see similar trends among rural-urban migrants or interregional migrants, as with the case of Newfoundlanders leaving the island for the cities of central Canada.

The other side to voluntary segregation, however, is involuntary segregation. Involuntary segregation can also occur for several reasons. Co-ethnics who share a paucity of human capital and economic resources may find that they have little alternative than to reside in lower rent districts or in neighbourhoods closer to certain types of employment.

A less benign reason for involuntary segregation results from discrimination. Historically, some religious groups—such as Jews in Europe—and some racial groups—such as African-Americans—have been legally relegated to specific neighbourhoods. While overt discrimination is no longer legally nor culturally sanctioned in most nations, a more insidious form of discrimination can exist when people are informally restricted in their access to certain neighbourhoods and institutions. This is typical of much nonwhite segregation in both the United States and Europe.

Some authors have suggested that such discriminatory practices are evident within parts of Canada. We have already touched on the issue in Saskatchewan. Drost et al. (1995: 48) studied the urban experiences of Aboriginal peoples and concluded that "the relatively higher residential concentration of Aboriginals[1] in the core city areas of the western CMAs may have lead to ghetto effects that exacerbate the already low degree of integration of Aboriginals . . . ."

Hypotheses

Researchers have put several explicit hypotheses or models forward in the literature to explain residential segregation. The ecological model predicts that cultural proximity among ethnic groups follows temporal patterns of succession. This is perhaps most likely with immigrants who come in successive waves, with one immigrant group geographically supplanting another in neighbourhoods where immigrants traditionally land. The pattern appears most pronounced when little variation occurs in human capital among immigrants, as happened in Nineteenth and early Twentieth Century Canada and the United States. With a greater diversity in human capital, however, the strict

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[1]There is no evidence that Drost, Crowley and Schwindt actually investigated the concentrations of Aboriginal populations in the core of cities. It seems they took this as a given.

ecological successionist model is likely to be less obvious. Newer migrants with higher levels of capital—whether they are monetary, or educational and linguistic abilities—are more able to merge more rapidly into existing communities.

Thus, even under the ecological succession model, we would expect internal migrants such as Aboriginal peoples to be less residentially concentrated than immigrants since some reasons that have traditionally led to extreme patterns of concentration do not exist. As indigenous peoples, Aboriginal people are more likely to have friends and relatives who have lived in urban centres for a longer period. This means that those people who may act as a residential "draw" are probably more widely dispersed. Similarly, some human capital aspects that create co-ethnic clumping (such as language ability) do not serve as structural barriers for most First Nations people, especially in the south.

On the other hand, the "social distance hypothesis" suggests that despite all else, groups with more similar cultural backgrounds are more likely to coexist in similar neighbourhoods. Thus, for example, one would not be surprised to see people of Mediterranean origin residing together. On the other hand, the co-residence of people of Chinese and Italian origin would be considered less likely under this model. While we may operationalize social distance in several ways, this hypothesis implicitly assumes that cultural affinity is more important in determining group-level social relationships than economic and other factors. The classic work in this area is that of Bogardus (1928) who developed his "social distance scale." More recently, Canadian research by Pineo (1977) and others (e.g., Balakrishan, 1982) has used measures of "social standing" and found that in Canadian metropolitan areas, residential segregation increases with social distance.

The quantity of research on social distance is limited. This is probably a consequence of the difficulties inherent in measuring cultural similarity. Far more research exists, however, into the socioeconomic determinants of residential segregation. This research suggests that social class and all that it entails—differing levels of human capital, income and wealth—are more important than sociocultural factors in determining residential patterns.

The Data

The primary focus of this research is on urban residential patterns of Canada's First Nations peoples.

The source of data for the analysis is the Census of Canada. In the 1996 Census, questions relating to formal Indian "status" were asked along with many questions concerning self-report of ethnic affiliation. The existing data tables produced and distributed by Statistics Canada at the level of analysis required for the study do not include the "Status Indian" marker. Consequently, we have used single-origin responses to the question whether a person is a North American Indian as a proxy for First Nations status. While some slippage occurs across the two categories, analyses of the individual level public use sample file suggest that most people who say they are single-origin North American Indians are also Status Indians.

There is a higher proportion of non single-origin Status Indians who are omitted from the analysis. These are people who have official status either through marriage or mixed ancestry. Compared with other potential sources of error, we judged the definitional slippage in this area to be sufficiently small as to not invalidate the estimates and conclusions of this study.

Consistent with previous research on Canadian ethnic diversity, we have divided the population into its most significant single response categories based on overall group size, and combined all other respondents (including those providing multiple responses) into a residual, "other," category. Since the focus of the paper is on First Nations peoples, we have also included Inuit and Métis as separate ethnic groups despite their numbers being small in some regions. Using the 1996 Census definitions, the seventeen single groups consisted of those who defined themselves as single origin African, Black, Chinese, Dutch, English, French, German, Inuit, Italian, Jewish, Métis, North American Indian, Polish, Portuguese, South East Asians, South Asians, and Ukrainians.

Not all CMAs were included in the analysis. We chose fourteen CMAs for our analysis based on their having significant numbers of people who identified themselves as belonging to a

Table 1: Population counts for *North American Indians* in 14 major CMAs (1996).

City	No. of Census Tracts	Total Population	Single-origin North American Indian
Calgary	153	824,628	16,810
Edmonton	187	862,531	31,350
Halifax	75	332,518	6,850
Hamilton	162	624,205	9,325
London	87	398,616	7,020
Montreal	756	3,326,027	36,570
Ottawa-Hull	214	1,010,417	23,030
Quebec City	152	671,889	6,855
Regina-Saskatoon	99	412,708	23,365
Sudbury-Thunder Bay	68	286,050	13,120
Toronto	804	4,259,894	34,105
Vancouver	289	1,831,663	38,005
Victoria	65	304,287	9,035
Winnipeg	157	667,209	28,315
Overall	3,277	15,809,642	283,755

single origin Aboriginal group. Previous analysis by Drost et al. (1995) found that the concentrations of Aboriginals and non-Aboriginals varied a great deal city to city. To ensure enough census tracts for analysis, we also decided to combine Regina and Saskatoon, Ottawa and Hull, and Sudbury and Thunder Bay into single entities. Thus, the sample of urban areas examined included: Calgary, Edmonton, Halifax, Hamilton, London, Montreal, Ottawa-Hull, Quebec City, Regina-Saskatoon, Sudbury-Thunder Bay, Toronto, Vancouver, Victoria, and Winnipeg.

While many studies of residential segregation use enumeration areas as their basic geographical unit of analysis, we use the larger agglomeration of census tracts. We take this approach because single-origin North American Indians form a small proportion of the population. Consequently, many enumeration areas have zero observations for this group. We avoid, therefore, a lack of robustness in many statistical estimates employed in this analysis.

The number of census tracts, total CMA populations and total single-origin North American Indian populations are listed in Table 1. People indicating that they are of single-origin North American Indian origin comprise approximately 1.8% of the population considered.

Limitations of the Data

One of the difficulties in comparing First Nations peoples with other ethnic groups is the way the Census records ethnicity. For many years, the Census asked questions in a way that allowed researchers to aggregate single and multiple responses, since respondents were asked to indicate their primary ethnic affiliation. Currently, identification is not as clear because it is impossible to attribute primacy among multiple responses. For example, identifying single response Chinese and single response English is possible. If someone provides a multiple, Chinese-English response, however, it is not clear whether they identify primarily with one group over the other. Statistical analysis among multiple respondents becomes extremely difficult because one either ends with duplicate counts, or the number of multiple response combinations becomes so complex as to pose problems of interpretation.

A further limitation of the data is that is relies of self-identification. From the perspective of the census, people are whom they say they are. This can lead to the problems illustrated in Ryder's (1955) classic study of the recording of Canadians of German origin before and after World War II.

Without doubt, the policy shift of the Government of Canada to emphasise multiculturalism in the mid to late 1960s led to a greater acceptance of diversity within the Canadian matrix. This has resulted in many Canadians, including Aboriginal Canadians, reporting origins that they previously refused to proclaim in public. The increased willingness to self-identify among Aboriginal peoples confounds many of our estimates. For example, many sources conclude that the rate of migration of Aboriginal people into our major cities increased from the 1950s through to the 1990s. Peters (2000: 247) suggests that the absolute increase between 1981 and 1991 was greater than the increase between 1971 and 1981. How much of that increase is due to actual migration and how much is simply due to changes in self-identification is open to debate.

Overall Ethnic Diversity

Since people of Aboriginal origin constitute only a small proportion of the population of Canada, our first step involved an examination of the data to ensure that there was enough variance throughout the target CMAs. As a byproduct of that analysis, we produced a series of maps presenting the distribution of single-origin North American Indians by census tract. Those maps appear in Appendix A.

Although the focus of this research is on First Nations peoples, providing an overall context of ethnic diversity within Canada's urban areas is worthwhile. Thus, one of the first questions we might ask is: How ethnically diverse are Canada's major cities? This question may be addressed by examining the data from the latest (1996) Census of Canada where the question of ethnic origin is examined in considerable detail.

While there is considerable discussion in the literature as to the most appropriate measure, two statistics appear most often. The first measure, S, is the Interaction or the Simpson Index.[2]

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[2]Given a population broken down into K groups, the formula for S is

$$S = 1 - \sum_{k=1}^{K} (P_k)^2.$$

Where $P_k = N_k/N$,
N_k = number of people in the kth group
N = total number of people in the population

Table 2: Ethnic diversity in 14 major CMAs

City	Diversity Index, S	Entropy Index, E
Overall	0.598	0.467
Toronto	0.645	0.495
Vancouver	0.63	0.518
Winnipeg	0.611	0.463
Edmonton	0.576	0.45
Montreal	0.568	0.549
Hamilton	0.542	0.459
Regina-Saskatoon	0.538	0.457
Sudbury-Thunder Bay	0.524	0.456
Ottawa-Hull	0.507	0.453
Calgary	0.503	0.422
Quebec City	0.503	0.648
Victoria	0.497	0.459
London	0.481	0.429
Halifax	0.386	0.385

S reaches its minimum value of zero when the population consists of a single group; its maximum, $1-(1/S^2)$, occurs when all K groups are of equal size. If two persons are chosen at random from the population, S suggests the "average differentness" between them.

A second statistic often used to measure diversity is the Entropy Index. Many researchers also know this index as the Shannon Index.[3] As with S, the minimum value for E occurs when the population consists of a single homogenous group. E achieves its maximum value, log K, when the population is equally distributed over all of the K subgroups. All else being equal, K increases as the number of groups increases. While the value of E does not have an upper limit, it can be "normed" by dividing by its maximum value.[4]

Table 2 presents the Simpson and Entropy Indices for the fourteen CMAs along with an overall measure of all CMAs combined. The CMAs are ordered based on their level of ethnic diversity as measured by S. Although the relationship between S and E is close, there are some differences in how the CMAs would be ordered. The overall pattern suggests three primary findings. First, Canada's major CMAs are quite diverse concerning their overall ethnic composition. By international standards, the values of the indices are quite high. Second, while the CMAs show high overall levels of diversity, considerable variability exists across the CMAs. Third, diversity is roughly correlated with size. The largest urban areas—Toronto, Vancouver, Winnipeg, etc.—have the largest diversity scores, while the smaller CMAs—Victoria, London, Halifax, etc.— have the lowest diversity scores.

Overall indices of ethnic diversity, however, do not tell us how evenly distributed or how residentially mixed a particular CMA might be. Thus, our second analysis focuses on measures of overall residential segregation.

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[3]Formally, the Entropy Index is defined as

$$E = -\sum_{K=1}^{K} P_k \log(P_k).$$

[4]Norming is more of an issue when the number of groups to be compared differs across regions.

Residential Segregation

There has been a long tradition in the sociological literature of analysing residential segregation. The issue came to the forefront in the 1930s when the Chicago School examined residential distribution patterns to test hypotheses relating to social ecology (e.g., Park, 1925; 1936a; 1936b; Park and Burgess, 1921). More recent analysts have concerned themselves with processes of socioeconomic development and discrimination.

The empirical reality for most communities is that many interesting sociological characteristics—such as ethnicity—are not evenly distributed across a community. Instead, we find population "clumping" where some groups concentrate more in certain geographical areas than others. Pursued further, we also find that, when we examine several groups, differential sociometric overlaps occur across groups. Before explaining why those patterns exist, examining the pattern of clustering and overlapping in more detail is worthwhile.

There are several ways of conceptualizing residential segregation. One way is to consider a single group and to examine its distribution across subdistricts—such as neighbourhoods or census tracts—within a community. While we may employ several measures of diversity, the Gini Index is one of the most commonly used. Another way of conceptualizing residential segregation is to compare the distribution of group A relative to group B. Here, we recognize that no single group is evenly distributed across a community. This makes sense when we remember that geographical subunits are arbitrary creations, or are based on geophysical characteristics that are independent of population. For example, we would not expect any group to be proportionately distributed in both industrial and non industrial sections of a community. What is important, however, is how groups are distributed relative to one another.

American sociologists, for example, have spent considerable effort showing that members of minority groups, such as African-Americans, Hispanics, and people of Asian decent, do not have residential patterns that parallel those of white Americans. Again, several statistics can measure differences in residential patterns, but the most commonly employed is a statistics known as D, the Diversity Index. In this section, we will examine the relative within group clumping of First Nations relative non First Nations people, as measured by the Gini Index and the Index of Dissimilarity.

Within Group Distributions

Using the Gini Index, we can obtain a measure of how evenly distributed a group is across census tracts.[5] There are several ways of understanding the Gini Index. Here we are focussing on the proportion of First Nations people within each CD compared with the total population of the CD. Used this way, the Gini Index provides an indication of how much dissimilarity exists among the proportions of First Nations peoples compared with the total possible dissimilarity across the CDs. If each CD has the same proportion of First Nations people, then the value of the Gini index is 0. The maximum value of the Gini coefficient is one and this occurs when the maximum level of dissimilarity occurs.

Table 3 displays Gini Indices for single response North American Indians (the proxy for First Nations peoples) compared with the total population. Across all CMAs examined, the Gini Index is .522. The variation across cities is substantial, with Ottawa having the lowest overall measure of residential segregation at .288 and Winnipeg has the highest value of .552. The fact that the Gini Index for North American Indians is high is not too surprising; they do comprise a small proportion of the overall population and many census tracts have very low or zero population counts for that group.

Another common measure of residential diversity is the Dissimilarity Index, D.[6] D provides

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[5]There are several ways of estimating the Gini coefficient. Here, we use the approach taken by James and Taeuber (1985) and White (1986) which formulates in an a segregation index. Specifically we use

$$G = \sum_{i=1}^{I} \sum_{j=1}^{J} t_i\, t_j\, |p_i - p_j|/2T^2P(1-P)$$

where I=J or the total number of areas,
t_i and t_j = the population totals in areas i and j,
p_i and p_j = the proportion of the ith or j^{th} area's population which is North American Indian,
T = the size of the total population,
P = the proportion of North American Indians in the total population.

[6]D may be constructed as

$$D = \sum_{i=1}^{I} \left| \frac{n_{ik}}{N_k} - \frac{n_{il}}{N_l} \right| \cdot .5$$

where i subscripts I subareas,
k,l reference specific ethnic groups,

Table 3: Ethnic residential segregation in 14 major CMAs.

City	Gini Index	Diversity Index, D
Overall	0.511	0.364
Winnipeg	0.552	0.408
Regina-Saskatoon	0.535	0.401
Toronto	0.466	0.335
Hamilton	0.429	0.303
Edmonton	0.412	0.3
Vancouver	0.393	0.275
Montreal	0.389	0.274
London	0.381	0.236
Sudbury-Thunder Bay	0.366	0.265
Quebec City	0.359	0.248
Victoria	0.358	0.265
Calgary	0.355	0.259
Ottawa-Hull	0.288	0.199
Halifax	0.28	0.195

n_{ik} = number of people in the ith area and k^{th} group,

N_k = total number of people in k^{th} group.

an indication of how far apart two distributions are. To provide points of comparison, the Dissimilarity Index based on the distribution of single origin Italians across the fourteen CMAs compared with the overall population is .545; for single origin English, it is .326, and for Chinese it is .597.

Referring to Table 3, we see that when North American Indians are compared with the total population, the overall value for D is .364. The range is between .195 in Halifax and .408 in Winnipeg. In most of the CMAs, however, the Diversity Index is below the overall value of .364. Relatively speaking, this suggests that North American Indians are more evenly distributed across the CMAs considered here than most other ethnic groups.

Ethnic Residential Interaction

Another feature of residential settlement patterns we can explore is who resides with whom? Given that two or more groups are differentially dispersed throughout an area, which are more likely to come in contact with one another?

An index similar to Simpson's Diversity Index is variously identified in the literature as B_{kl} or xPy.[7] This index measures the likely interaction or exposure of one group to another based on its residential distribution. Unlike many similar measures, xPy is asymmetrical. That is, xPy is not necessarily equivalent to yPx. This situation is easily illustrated through a simple example. A community has two groups: one relatively small and the other relatively large. The small group is likely to come into contact with members of the larger group but members of the large group are less likely to come into contact with members of a small group. As the following tables show, this is the case of residential proximity between Inuit people and those people classified as North American Indians.

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[7]xPy is calculated as

$$xPy = \sum_{i=1}^{I} (n_k / N_k)(n_{il} / n_i)$$

where i subscripts I subareas,
k,l reference specific ethnic groups,
n_{ik} = number of people in the ith area and k[th] group,
N_k = total number of people in k[th] group.

Small values of xPy indicate a low probability of residential association while larger values indicate probability association. The index does not measure actual individual level interaction: it measures the *potential* for exposure based on similar residential patterns. Since xPy is asymmetrical, two tables are provided. Table 4 shows the residential interaction (xPy) between other ethnic groups with North American Indians. Table 5, on the other hand, shows the residential interaction between North American Indians and other ethnic groups. Both tables are ordered by the interaction index from lowest to highest.

Looking at the residential relationship of other single-origin groups to North American Indians (as reported in Table 4), we see that other single-origin Aboriginal people and some visible minorities (Africans and Blacks) tend to have high levels of co-residence with North American Indians. Inuit people living in CMAs appear to reside almost exclusively in the same census tracts as single-origin North American Indians. On the other hand, some visible minorities—specifically people of South-east Asian, Chinese, and South Asian origin—are among the least likely to co-reside in the same census tracts as North American Indians.

Conversely, Table 5 shows that North American Indians are most likely to live among "majority" single-origin ethnic groups. They are least likely to co-reside with other Aboriginal groups and with some visible minorities. Part of the reason for the different patterns illustrated in Tables 4 and 5 is due to the previously mentioned issue of small groups being concentrated and overlapping almost exclusively within the domain of a larger group. Most of the larger group, on the other hand, does not co-reside with the smaller group. Another explanation for the divergence between Tables 4 and 5 is due to the high concentration of North American Indians in some western CMAs, but their being more sparsely distributed elsewhere where we find higher concentrations of other groups.

Table 4: Interaction (xPy) Index Associating Other Single-origin Ethnic Groups with *North American Indians*

Ethnic Group	Other ethnic groups with North American Indians
Inuit	0.826
Métis	0.611
African	0.536
Black	0.491
Dutch	0.466
Ukranian	0.402
Polish	0.366
German	0.358
Southeast Asian	0.357
Portugese	0.249
English	0.179
Italian	0.148
South Asian	0.145
Chinese	0.130
Jewish	0.128
French	0.098
Other	0.027

Table 5: Interaction (xPy) Index Associating *North American Indians* with Other Single-origin Ethnic Groups

Ethnic Group	North American Indians with other ethnic groups
Other	0.929
English	0.572
French	0.458
German	0.392
Chinese	0.348
Italian	0.317
South Asian	0.307
Ukranian	0.282
Polish	0.249
Dutch	0.211
Métis	0.202
Southeast Asian	0.187
Portugese	0.185
Jewish	0.085
African	0.051
Black	0.042
Inuit	0.014

Correlates of Aboriginal Residential Patterns

Given that the previous analysis shows that some "clumping" exists in the residential patterns of people of Aboriginal descent in large urban areas, the question comes to mind as to what are some of the correlates of those patterns? Specifically, is it possible, based on known sociodemographic characteristics of the census tracts, to predict which ones are likely to have higher concentrations of Aboriginal Canadians than others?

Based on previous research, we have chosen to examine five categories of predictors—income, education, migration (or population stability), type of housing stock and neighbourhood family structure. Among the income indicators we have selected are the unemployment rate in the census tract, the average family income within a tract, the average percent of family income resulting from government transfers, and the percent of families officially classified as "low income." The education indicators are the percent of the population in a tract with less than grade nine education, the percent with secondary school diplomas and the percent with some secondary school but without a graduation certificate. Two variables measure migration or population stability: the percentage of the people who lived in the census tract five years ago and the percent of the population who are immigrants. Housing stock is characterized by the percent of attached housing and the percent of single family dwellings. Among the family structure indicators that are available for analysis are the percentage of lone parent families and the percent of families with children in the tract.

We have conducted parallel analyses for the overall percent of the tract's population that reports some Aboriginal affiliation—whether single response North American Indian, multiple response North American Indian, Métis, or Inuit—and for the percent of those indicating single response North American Indian only.

The results of the two regression equations are presented in Table 6. The model for all Aboriginal people explains about 38 percent of the variation in their residential pattern. When we focus on single origin North American Indians only, the model explains about 32 percent of the variation in residency. Both models are statistically significant by most standard statistical criteria and both explain a substantial amount of the variation in the clustering of Aboriginal people by residence. On the other hand, the remaining sixty-plus percent of the unexplained

Table 6: Predictors of Aboriginal Residency

Variable	All Aboriginal People		North American Indian (single origin only)	
	b-value	t-value	b-value	t-value
Intercept	-5.0557	-5.29	-4.0384	-6.41
Unemployment rate	.0431	2.24[*]	.0655	5.16[‡]
Average income	.1987[4]	-2.33[*]	.1128[4]	-2.00
Percent government income	.0583	3.55[‡]	.0306	2.82[†]
Percent families with low income	.0775	8.12[‡]	.0299	4.76[‡]
Percent less than grade nine	-.0698	-6.64[‡]	-.0431	-6.12[‡]
Percent some secondary school	.1552	15.13[‡]	.0872	12.91[‡]
Percent graduate secondary school	-.2094	-14.79[‡]	-.1116	-11.96[‡]
Percent non migrants	.0136	4.50[‡]	.0071	3.57[‡]
Percent immigrants	-.0484	-13.72[‡]	-.0243	-10.47[‡]
Percent attached dwellings	.0207	4.63[‡]	.0115	3.91[‡]
Percent single family dwellings	.0289	9.01[‡]	.0163	7.72[‡]
Average household size	2.6446	5.45[‡]	2.0202	6.32[‡]
Percent lone parent families	.0217	1.75	.0240	2.94[†]
Percent families with children	-.0729	-6.45[‡]	-.0541	-7.27[‡]
R-squared	.384		.321	
N	3,276		3,276	

Notes:
   Superscripted number indicates number of zeros after decimal place.
   * p < .05
   † p < .01
   ‡ p < .001

variation suggests that there are likely substantial factors relating to residential location that are not reflected in the model.

If we examine the models in more detail, the findings are generally consistent with the size of the R^2-value and the overall significance level of the model. With few exceptions, most variables have p-values less than .001 suggesting a high level of statistical significance. One area where the indicators are somewhat mixed relates to income.

When all Aboriginal origins are considered, there is a slight tendency for a higher concentration of Aboriginal people to be correlated with the level of overall unemployment in the area.[8] The t-value is significant at the .05 level although the regression coefficient is not large in absolute terms. When we examine the regression for single origin North American Indians, the relationship increases between residential concentration and the areas unemployment rate. On the other hand, the relationship between the proportion of Aboriginal people in an area and the average income in an area is not statistically significant, in the equation for single origin people, but is significant ($p < .05$) when considering all people of Aboriginal origin.

The two other economic indicators—percent of income from governmental sources and percent of low income families—are significantly correlated with concentrations of Aboriginal people in both equations. The magnitudes of the correlations, however, are less for single as opposed to multiple origin people. This is perhaps not too surprising since single origin people are more likely to be Status Indians who may have the option of reserve-based housing. Thus, people who can afford only to live in the lowest cost areas of a city may choose instead to live on a reserve where housing is often "free" or more modestly priced.

The parameters for education follow an expected pattern once we consider other elements of the model. These parameters suggest that both single North American Indian and all people of Aboriginal origin tend to live in areas where the typical resident has some high school but has not acquired a graduation certificate. The negative correlation with less than grade nine education may

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[8]The characteristics of the area relate to the area as a whole and not simply Aboriginal people. Thus, the fact that there is a higher concentration of people of Aboriginal descent in an area of higher unemployment does not *necessarily* mean that it is Aboriginal people who have high levels of unemployment. This is merely a characteristic of the population as a whole.

be puzzling until we note that there is also a negative relationship between proportion of Aboriginal residents in an area and percent of the population who are immigrants in an area. Separate analyses of the relationship between levels of formal education and nativity indicate that while many immigrants are highly educated, they are also disproportionately represented among those who have eight or fewer years of education.

While other research (Clatworthy, 1996; 2000) suggests that there is substantial mobility among Status Indians who move to urban areas, there is a positive relationship between the proportion of people of Aboriginal origin and the stability of the neighbourhood. That is, the higher the proportion of residents who lived in the same census tract five years ago and the fewer the number of immigrants in an area, the higher the proportion of people of Aboriginal origin living in that area.

As to housing stock and residential arrangements, there is a positive relationship between the percent of the residents who are of Aboriginal origin and the relative quantity of single family dwellings and attached houses. Implicit here, is the consideration that Aboriginal people are less likely to be concentrated in areas where high-rise apartments and other forms of housing predominate. The largest absolute parameter values in the regression models are also positively related to average household size. Overall, at the aggregate level, people of Aboriginal origin are more likely to concentrate in those census tracts characterised by single family or attached dwellings with relatively large numbers of people per dwelling unit.

The other dimension beside income on which the two regression equations differ is concerning the mix of family structures within census tracts. The negative parameter value for the proportion of families with children indicates that both groups are more likely concentrate in areas with higher proportions of single persons. On the other hand, the regression coefficient for lone parent families is statistically significant when people of single North American Indian origin only are considered but not when all people of Aboriginal origin are considered.

Taken together, these indicators suggest that Aboriginal people who live in the CMAs considered in this study are more likely concentrate in those neighbourhoods that are primarily working class.

Further Issues

The analysis conducted here is static: it reflects the situation at one point in time. Residential settlement patterns are dynamic. The examination of residential patterns of urban Aboriginals provides some insight into the issue but many of our most interesting hypotheses surround the dynamic aspect of settlement. That is to say, do settlement patterns change over time? Clatworthy's research addressing on- off-reserve migration to major urban centres indicates a substantial flow between First Nations communities and urban centres and between one urban centre and another. Not only does that dynamic need examination in greater detail, but the patterns of intra urban migration needs addressing. The classical successionist model suggests that much movement is of the "up and out" variety, following a general pattern of upward economic and social mobility. It is an empirical question as to whether this pattern holds for any or all of Canada's First Nations people who choose to live in major urban centres.

Further research exploring neighbourhood dynamics would also be beneficial. Knowing the degree to which existing institutions and organizations servicing Aboriginal communities act as a draw would be useful. Migration research focussing on both internal and international migrants has led to the notion of "chain migration." This means that people are drawn to neighbourhoods already settled by family, friends and co-ethnics since established residents often ease the search for housing and jobs. Chain migration appears to be a large factor underlying the settlement patterns of Aboriginal peoples. An interesting question is whether this process is more pronounced among Aboriginal peoples than other Canadians. The conventional wisdom surrounding the importance of extended family and community within First Nations communities suggests that this might be the case.

We are also unaware, except through anecdotal evidence, of the systematic role that proximity to reserves and connecting transportation routes play in the process of urban settlement. Our analyses of residential segregation suggest that Aboriginal peoples in most major communities are reasonably well integrated into the geographical urban landscape. On the other hand, it is clear that many Aboriginal groups are much more segregated in some cities. It would be interesting to know what circumstances underlie those differences, and to what degree those differences are due to "pull" factors and to what degree they are influence by "push" factors.
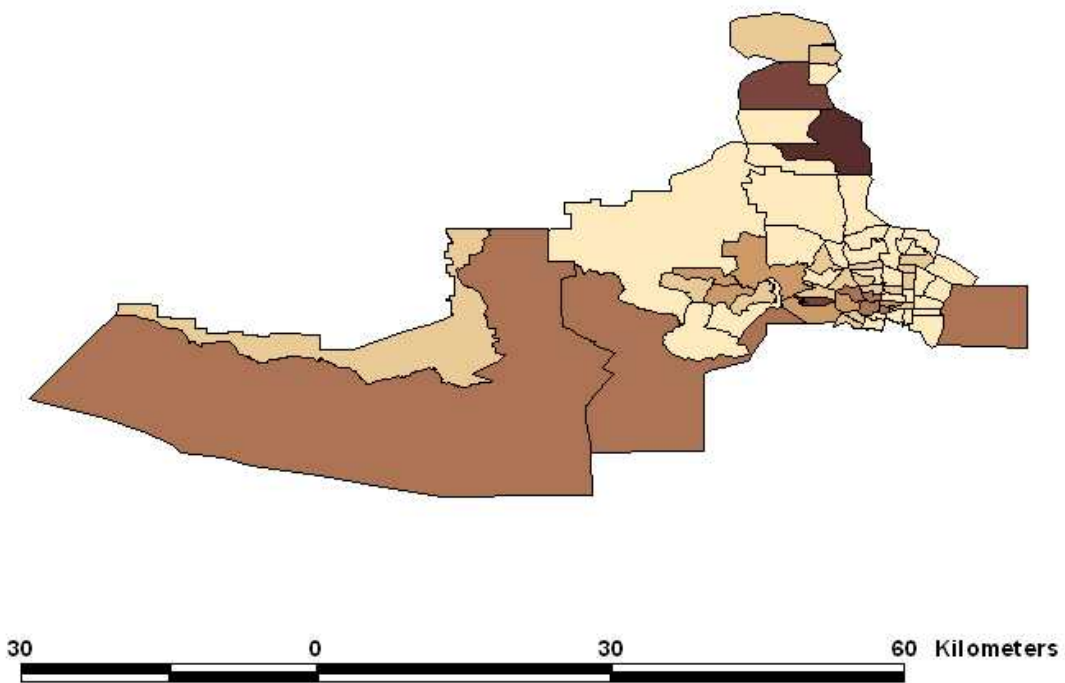
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APPENDIX A

Victoria

30   0   30   60   Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Vancouver

30   0   30   60 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Calgary

30   0   30   60 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Edmonton

60   0   60   120 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Regina

30   0   30   60 Kilometers

N

Percent North American Indians (S.O.)

- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8

Saskatoon

40   0   40   80 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Winnipeg

40   0   40   80 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Thunderbay

30   0   30   60 Kilometers

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

N

Sudbury

30   0   30   60   Kilometers

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

N

London

10   0   10   20 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Hamilton

10 0 10 20 Kilometers

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

N

Toronto

40   0   40   80   Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Ottawa

30   0   30   60 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Montreal

30   0   30   60   Kilometers

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

N

Quebec

20   0   20   40 Miles

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +

Halifax

30   0   30   60 Kilometers

N

Percent North American Indians (S.O.)
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 8
- 8 +