Accessing the best possible neighborhood: Family types and residential cross-segregation

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Diverging from most segregation studies, we focus on a narrowly defined form of demographic segregation: segregation by family type. Naturally, since the spatial distribution of married, cohabiting, single-mother, and single-father families does not depend solely on their structure, we must also take into account other aspects of their identity, such as their socioeconomic and ethnocultural characteristics. The combination of these factors creates a cross-segregation that we investigate using 2006 census microdata for the Montréal metropolitan area. We first use maps and segregation indices to highlight a "raw" form of family type segregation and we then use locational attainment models to evaluate the "net" association of family types with neighborhood income. Even if we find that family type in itself isn't a major predictor of locational attainment, the significant interaction between ethnicity and family type leads us to question family research that does not consider family types' internal heterogeneity.

The neighborhoods in which families live are not equal. All of them are not as easily accessible by car or public transport, nor do they offer the same quality and quantity of schools, parks, or local shops. Some of them are populated by wealthy, educated and active individuals; others show high rates of unemployment or school dropout. And those intra-urban inequalities are on the rise: rich neighborhoods are getting richer and poor neighborhoods, poorer. In Canadian cities, this dynamic is well established (Heisz and McLeod 2004).

Under these conditions, accessing the *best possible* neighborhood becomes an important practical issue for young families. To some extent, they engage in a competition to give their children a safe and stimulating environment, a competition, however, for which all families are not equally equipped. Are single parents, for instance, systematically at a disadvantage compared to two-parent families in their search for a place to live? Do these handicaps result in the geographic isolation of certain types of families in urban space? And are the residential differences between family groups only the consequence of socioeconomic disparities, or is there a more direct association between family type and neighborhood *quality*?

Behind those questions lies the idea of residential segregation but also that of *locational attainment*, i.e. the ability of families to obtain a *residential return* on their socioeconomic characteristics (Villemez 1980; Logan et al. 1996). As families with children are not homogeneous, this means that we must analyze several other aspects of their identity (race, income, etc.) and consider the possibility that different forms of segregation may come to intersect, combining their effects in complex patterns. Given the lack of recent studies concerned with family segregation and neighborhood inequality, especially in combination with ethnocultural issues (Fossett 2005), this study is therefore primarily exploratory in nature and its scope is limited to the Census Metropolitan Area (CMA) of Montréal, Québec, Canada.

Theoretical Background

Apart from its substantive importance, if this study is not restricted to family type but also explores the ethnocultural background of parents, it's mainly because the tools and analytical framework that we use are derived from a literature in which race and ethnicity are central. Even if it has long been suggested that city-dwellers locate according to three main factors – socioeconomic status, ethnocultural identity and stage in the life cycle –, it's the study of racial segregation and immigrants' spatial assimilation that has generated the most consistent set of spatial indices and estimation techniques. Although these tools are readily adaptable to the field of family studies, they have seldom been used up to now.

Spatial assimilation

The spatial assimilation model, first formulated by Robert E. Park (1979 [1926]) and updated in the 1980s (Massey and Mullan 1984), is concerned by the spatial dynamics of ethnicity and socioeconomic status in North American cities. This model describes a long term process whereby immigrants, who initially established themselves in poor central neighborhoods, are able to access better residential areas. As they, or their children, gain work experience, improve their income, and perfect their language and cultural skills, they get a greater freedom of residential choice and often get away from ethnic enclaves to integrate suburban neighborhoods where majority members with the same socioeconomic status as theirs live. Spatial assimilation is thus a process, sometimes spanning several generations, in which cross-sectional ethnic residential differences may be considered primarily a result of socioeconomic and nativity differences between groups.

Admittedly, however, this theoretical framework, mostly based on the experience of European immigrants who arrived in the industrial cities of northeastern America in the early twentieth century, is not appropriate for all migrant groups. African Americans, for example, whose ancestors left the countryside of the American south for large northern cities also at the turn of the twentieth century, are still relegated to second-class neighborhoods (Massey and Denton 1993). At equal socioeconomic status, black Americans live in neighborhoods far poorer than white Americans (Logan et al. 1996; Rosenbaum and Friedman 2001). These findings have led some authors to craft a modified version of the spatial assimilation model: the place stratification model (Alba et al. 1994). Here, neighborhoods and social groups are hierarchically ordered. Immaterial barriers, such as discrimination on the housing market, work to deny access to the most coveted neighborhoods for members of certain groups defined by skin color or ethnicity, regardless of their personal socioeconomic resources.

Empirical models of locational attainment assess the residential advantage or disadvantage of different groups in a city. With explanatory variables measured at the individual (or family or household) level and a response variable

measured at the neighborhood level, they identify the *rates of spatial returns* that people belonging to various ethnic subgroups get from their socioeconomic characteristics. These models usually use cross-sectional data to approximate a longitudinal process by assuming that the differences between cohorts at that point reflect differences within cohorts at different points in time. This assumption being highly questionable, their usefulness is primarily descriptive; they give an image of segregative forces at work within a metropolitan area at a specific moment. Only under this very descriptive angle can they be adapted to the study of families, by moving their focus from ethnoracial considerations to family types.

Locational attainment transposed

Unlike ethnic identity or skin color, the type of family in which individuals live can easily and repeatedly change over their life course. For this reason, most of contemporary family studies are conceptualized in terms of trajectories, events, and transitions, a research paradigm made operational by the relatively recent availability of longitudinal data, both retrospective and prospective. In Canada, despite the extraordinary advances brought by these kinds of studies, the relatively small sample size of longitudinal surveys makes it very difficult to study anything at a geographical level smaller than that of provinces. Most of intra-provincial heterogeneity, either on a territorial basis (regions, cities, neighborhoods ...) or an ethnocultural one (language or ethnic groups, nativity status ...), is thus unfortunately masked. Only a database as large as the census currently allows the analysis of urban family subgroups.

After more than two decades of family research focusing mainly on life courses, *returning*[1] to cross-sectional and spatially-based family research requires some *essentialization* of family types. In fact, it requires that an individual's personal history take secondary position behind the type of family he or she belongs to at the time of the survey. The residential location of an individual is thus no longer to be seen as a direct result of his or her own trajectory, but rather as the product of current social conditions common to all families sharing the same structural type. This approach is of course disputable, but it is primarily intended to complement an approach based on the analysis of individual life courses. Despite their fluidity, family types exist ontologically as distinct social categories in political (public policy targeting single parents, for instance), scientific (especially demography), and legal discourses (married vs. cohabiting couples). That fact alone justifies an interest in cross-sectional family-type segregation.

[1] It's interesting to recall that there was, in the 1980s, an substantial group of researchers that were studying the relationship between evolving family forms and urban housing, including the mismatch between existing housing stock and the needs of these new families, especially single mothers. Whether in Québec (Rose and Le Bourdais 1986) in France (Bonvalet and Merlin 1988) or in the US (Myers 1990), this kind of studies was already becoming rarer by the early 1990s, probably washed away by the new paradigm's wave.

Demographic segregation

Following a pattern formulated by Burgess (1967[1925]), the traditional take on demographic segregation insist primarily on the concentric distribution of households according to family status (Balakrishnan and Jarvis 1991; Guest 1972; White 1987). Guest (1972), for instance, attempted to describe the location of various categories of households and identified the distance from the central business district (CBD) as a major element. In his analysis, he clearly distinguished four classic family types (young or old married couples without children and young or old married families with children), but all other family or non-family households, including cohabiting families and single parents, were regrouped into only two additional categories. Guest does find that young married families with children are less centralized than other household types, but with this dated family typology it is difficult to identify the relationship between distance from the CBD and the non-marital family forms that have since become much more common.

A decade later, using modified Guest models, researchers highlighted the greater centralization of single-parent families compared to two-parent families (Cook and Rudd 1984; Roncek et al. 1980). But in those models, racial and economic issues are brought to the surface and confuse the interpretation of the results. In the United States, single-parent families are disproportionately poor and black, and blacks are disproportionately poor and centralized. It is therefore unclear whether the average single-parent family lives in a poor central neighborhood because it is a single-parent family or because a large portion of those families are black and poor.

Cross-segregation

This problem of interaction between family type and racial identity makes apparent the existence of a cross-segregation that affects particular subgroups of families. A recent phone survey on discrimination in Toronto's rental market provides an excellent example of this cross-segregation in Canada (CERA 2009). With a methodology relying on pairs of individuals differing only on one element, the authors of the study find that 15 % of single mothers have experienced moderate or severe discrimination during their search for housing, while it was the case for only 2 % of the married mothers forming the control group. Yet, single mothers with a strong "black Caribbean" accent were significantly more often victim of discrimination (31 %) than single mothers with a "Canadian" accent. Discrimination based on family type and ethnicity thus combine to create very special situations for those families, situations that are too often ignored. Do white, Hispanic, Chinese, Indian or Arabic single-parent families, for instance, are as much segregated and centralized as black single-parent families? And into what kind of areas are these various family subgroups channeled?

Cohabitation

Studies of the spatial distribution of families with children are often limited to married and single-mother families. Much less is known of the differences between, married and cohabiting families on the one hand, or between single-mother and single-father families, on the other hand.

In spatial terms, the major difference between married and cohabiting families comes from their different propensity to own. In the 1980s, French researchers (Audirac and Chalvon-Demersay 1988) noted that cohabiting couples rejected marriage and homeownership along the same ideological lines: both were seen as an intrusion of law and order in their private lives. More pragmatically, however, the authors associated this devaluation of ownership with cohabiting couples' "economic frailty" which did not allow them to become homeowners in the first place. Today, even in societies where socioeconomic differences between married and cohabiting couples have virtually been eliminated, the gap in homeownership rate remains. In 2006, young Canadian cohabiters, with or without children, were two and a half times less likely than their married counterparts to be homeowners (Turcotte 2007).

This gap is important because owners and renters are not evenly distributed throughout the city. While the proportion of rented dwellings is near 50 % in the CMA of Montréal as a whole, there is a clear dichotomy between census tracts where renting is dominant and those where ownership is more common; few areas actually exhibit an egalitarian distribution of tenure types. Moreover, there is a very close relationship between the proportion of owned housing in a tract and its median household income. In Montréal, this correlation was as large as 0.67 in 2006. Because access to homeownership is easier for wealthy or high earning households, homeowners are generally richer than renters, and consequently neighborhoods of homeowners are wealthier than neighborhoods of renters. Thus, solely because of their different ownership rates, cohabiting families are likely to live in different, and poorer, neighborhoods than married families.

Single fathers

The two main arguments usually put forward to explain the lack of interest in male lone-parent families are their small numbers and their relatively privileged economic position compared to female-headed families. Recent developments in both matters no longer justify the quasi-silence surrounding single-fathers. Between the 1981 and the 2006 Canadian censuses, the fact that fathers were increasingly awarded child custody resulted in a drop of the femininity ratio of single parenthood. Among families with only children under 6 years old, this ratio fell from 10.5/1 to 5/1. For children of all ages, male-headed families now account for 19.9 % of single parent families in Canada (Milan et al. 2007). If women remain much more likely than men to be single parent in cross-sectional data, the sex gap is much narrower in longitudinal data: according to the 1990 Canadian GSS, 35 % of women have experienced an episode of single parent-

hood, while it is the case for 23 % of men (Desrosiers et al. 1999). Single fathers are certainly better off in terms of income, but their relative advantage is declining. Between the late 1970s and the late 2000s, along with the increasing labor market activity of women, the average income of single-mother families remained relatively stable at around 43 % that of the average two-parent family income. For single-father families, this relative measure dropped from 80 % to 62 % (Statistique Canada 2011).

Of the residential distribution of single fathers and their children, we know close to nothing. At best, we note that European fathers who get custody of their children after a divorce retain the original marital home much more often than do mothers who get custody (Eggerickx et al. 2002; Festy 1988). As this marital home was acquired during a period when the family counted two parents, it is probably located in a more affluent neighborhood than would be a new residence acquired after separation. From this simple fact, we can conclude that European single fathers probably have a residential advantage over single mothers. But since the practical arrangements following divorce appear to be reversed in the United States (South et al. 1998), it is difficult to establish which alternative prevails in Montréal. We do know that single fathers are more likely to own their homes than are single mothers, but this gap also tends to narrow.

Families' locational attainment

Because there are wide family structure variations between ethnic groups, authors of locational attainment models usually consider family type as a factor that needs to be controlled for. Despite the presence of a categorical family type variable in most locational attainment models, this control-variable status means that little attention is paid to their elaboration, much less to their interpretation. Even in recent studies, the most often used family variables simply oppose households headed by married couples to all other households (Alba and Logan 1991; Friedman and Rosenbaum 2007), a typology reminiscent of the 1970s' models discussed earlier. The use of household or, in Canadian studies, *economic families* as unit of analysis also brings complications in this regard. Single parents who share their home with a related adult (brother, mother, or even an adult son ...) find themselves categorized as a two-adults-with-children family as are *real* two-parent families (Fong and Hou 2009; Myles and Hou 2004).

Only in Howden's (2005) study of Houston, Texas, are households headed by married couples and single-mothers clearly identified in distinct categories. She concludes from her models that family type does have an impact on neighborhood quality, but that this impact is rather low compared to that of race. By taking into account the interaction between race and family type her research also highlights the fact that the disadvantage of single-parent families is greater among white families than among black or Hispanic families. Unfortunately, her sample does not include any cohabiting nor single-father families. In addition, the models she uses only have three very basic predictors: family type (married couples / single mothers), poverty status (poor / non-poor) and race (white

/ black / Hispanic). The lack of control, among other things, for education level or tenure stems partly from the fact that like most American researchers, but unlike Canadian researchers, she does not use real census microdata, but rather pseudo-individual data simulated from correlation matrices of aggregate and individual data (Alba and Logan 1992).

Montréal

More than 3.6 million people called Greater Montréal their home in 2006 making it the second largest city in Canada and the largest in the province of Québec. The city being one of the first settlement area of New France, the majority of its inhabitants (65 %) have French as their mother tongue. The British Conquest of 1763, the American Independence War, and the ensuing arrival of British Isles immigrants and Royalists have brought an important anglophone (and protestant) element to Montréal's population (12 %). This minority has traditionally controlled much of the trade and industry of this former economic capital of Canada. The status quo of this double segregation, economic and linguistic, was largely disturbed in the 1960s by a social and political awakening of the francophones of Québec called the Quiet Revolution. They massively rejected the domination of the Catholic Church and invaded business schools and political offices in the provincial and federal governments. In 1980, a first referendum on Québec's independence lead many anglophone Montrealers to flee to more stable grounds, in the rest of Canada. Due to the recent increase and diversification of international immigration, "allophones" – people speaking another language than French or English – have outnumbered anglophones in contemporary Montreal (23 %). Traditionally, immigrants assimilated more to the economically advantaged English-speaking group, but in recent decades considerable, if not all successful, efforts have been made by provincial authorities to better select and *frenchify* these newcomers. More then racial or income segregation, language segregation is still the dominant and most studied feature of Montréal's residential landscape even if it slowly tends to decrease over time (Charron 2002; Germain and Rose 2000).

A key element that makes Québec in general and Montréal in particular an interesting case study in family research is the high prevalence of cohabiting couples with children. The decline of the Catholic Church's influence on francophones' behaviors was accompanied by a very sharp increase in the proportion of out-of-wedlock births (Laplante 2006): They now represent 63 % of all births occuring in Québec, up from 4 % in 1960. The vast majority of these children (85 %) are born to cohabiting couples. If this rapidly evolving situation has sparked numerous research initiatives in the demography and sociology of family, spatially-based family research remains very scarce. Moreover, family structure variation across ethnic groups have not been a central element of most studies; provinces are the usual unit of analysis. Unlike the U.S. Census Bureau, which provides clear cross tabulations of family types according to racial categories, Statistics Canada publishes information that is difficult to interpret. As families with children are not clearly identified in immigrant status, visi-

ble minority or language tables, the proportion of families belonging to various family types is not readily available. At best, one may find that cohabitation is more prevalent among francophones, whites and non-immigrants and that single-parenthood seems more common in subgroups such as blacks and immigrants from Latin-America, but less common in such other groups as Arabs or Asian immigrants.

To address the issue of family-type segregation in metropolitan Montréal we will first determine whether the different family types are distributed evenly across the urban space or if, as expected, there is a spatial heterogeneity within the larger group of families with children. This investigation will be conducted using data aggregated at the neighborhood level and with tools traditionally used in the study of segregation. These segregation indices can highlight the residential structure of a city in a simple and effective manner. However, they are unable to take into account multiple characteristics of families nor to describe the areas where segregated populations live. By using census microdata and multivariate models of locational attainment, we will try, in a second step, to isolate the relation between family type and neighborhood quality while considering possible interactions.

Data, models and variables

Units of analysis

The somewhat vague concept of neighborhood is delineated here by census tracts (CTs). These are small geographical units whose boundaries are established by Statistics Canada in collaboration with local authorities in order to respect the boundaries of higher level administrative units and the socioeconomic homogeneity of circumscribed populations (Statistique Canada 2010). The 863 CTs inhabited by families in the Census Metropolitan Area of Montréal contain an average population of 4200. CTs are the smallest geographical areas identified in the census microdata files (20 % of Canadian households) that were used for this study.

The *families* we are interested in are a subset of Statistics Canada's *census families* which correspond to couples (married or cohabiting, different or same-sex, with or without children) and single-parent families. We restricted our sample to those families led by a single parent or an opposite-sex couple and which included at least one child under 18. Families headed by same-sex couples are too few in numbers and too geographically concentrated to be taken into account in the limited framework of this project, but they would certainly deserve a more specific study. Although, most authors use households or *economic families* – i.e. all related individuals living in the same household – in their locational attainment models, the classification difficulties they encounter suggest that the census family is a more appropriate unit of analysis.

Four major types of families have been identified: two-parent families headed by a married couple (50.9 %), two-parent families headed by a cohabiting couple

(24.9 %), single-mother families (19.5 %), and single-father families (4.6 %). Like its predecessors, but unlike its successor, the 2006 Canadian census does not distinguish so-called *intact families* from *blended families*. Thus, when analyzing the results for married and cohabiting families, one as to be aware that the latter group contains more blended families than the former (Lapierre-Adamcyk and Marcil-Gratton 1999).

Segregation indices

The dissimilarity index assess whether two distinct groups are evenly distributed throughout the metropolitan area. Its values range from 0 to 1 and can be interpreted as the proportion of individuals that would have to move for the distribution of the two groups to be uniform. It is calculated using the following equation:

$$D = \frac{1}{2} \sum_{i=1}^{n} \left| \frac{x_i}{X} - \frac{y_i}{Y} \right|$$

where x_i and y_i are, respectively, the population size of group X and group Y in the neighborhood i, while X and Y are the population size of X and Y throughout the CMA.

The interaction index measures the degree of exposure of group X to group Y and can be interpreted as the average proportion of group Y members in the neighborhood of an average member of group X. An interaction index of 0.4 for instance means that, on average, 40 % of an X member's neighbors belong to group Y. The isolation index measures the exact same thing, but focuses on the exposure of group X members to members of their own group. They are obtained by these formulas:

$${}_xP_y^* = \sum_{i=1}^{n} \left(\frac{x_i}{X}\right) \left(\frac{y_i}{t_i}\right)$$

$${}_xP_x^* = \sum_{i=1}^{n} \left(\frac{x_i}{X}\right) \left(\frac{x_i}{t_i}\right)$$

where t_i is the total population in tract i and where the other elements have the same meaning than in the dissimilarity index formula. These exposure indices, more than the index of dissimilarity, are very sensitive to group size and must thus be interpreted carefully using CMA group proportions for comparison.

The location quotient (LQ) is not really an index of segregation but as it gives an individual value for each neighborhood it is a very useful cartographic tool. It is simply:

$$LQ_i = \frac{\left(\frac{x_i}{t_i}\right)}{\left(\frac{X}{T}\right)}$$

i.e. the ratio of the proportion of group X in the neighborhood to the proportion of group X in the entire CMA. An LQ of 1 means that the proportion of X in

neighborhood i is identical to that of the CMA, while a quotient below or above 1 indicates respectively an underrepresentation or an overrepresentation of X members.

Multivariate models

In locational attainment models, all families living in the same neighborhood share a common response variable value. The assumption of independence of OLS estimation residuals is consequently violated. This form of spatial autocorrelation should not, theoretically, bias the estimated coefficients themselves but their variance may be underestimated. Since they are a function of this variance, the results of parameters' hypothesis tests are thus flawed. To limit the consequences of this problem, we treat census tracts as if they were sampling clusters. This means that variance estimations take into account the fact that responses of people inhabiting the same tract are more correlated than the responses of people from different tracts. This analytical strategy expands significantly the confidence intervals of estimated coefficients, multiplying their range by an average factor of 1.5 (min 1; max 3.8). This method has the advantage of greatly reducing the possibility of Type I errors and of allowing a more assertive interpretation of the remaining statistically significant results.

Dependent variable

For reasons both substantive and practical, a single tract level indicator will be used in this study: the median annual income of all households living in the neighborhood. This is one of the most frequently used variables in locational attainment models and in studies of neighborhood effects. By choosing *median* neighborhood income, we avoid the linear relationship that binds the family income to the *mean* neighborhood income (Logan et al. 1996). Note that in the regression this variable underwent a logarithmic transformation to adjust its heavily skewed original distribution.

Independent variables

Since our multivariate models apply equally to single and two-parent families, the characteristics of both parents cannot be considered simultaneously in the analysis. Mother's education, for example, is missing for male lone-parent families and vice versa. In addition, the strong assortative mating of couples affects the interpretation of each spouse individual characteristics. The traditional approach to overcome both of these difficulties is to use only the characteristics of the householder (Rosenbaum and Friedman 2001), of the primary economic family maintainer (Myles and Hou 2004), or of a randomly selected parent (Alba and Logan 1991). Yet, coming back to our education example, one can think that the *effect* of having a father with a university degree will not be the same if the mother is also a university graduate or if she has not completed high school. For this reason, we approach the problem in an alternative way by combining

information from both parents in a single variable that we can compare directly with information from single parents (see Annex A).

Demographic characteristics of families included in the models are the mean age of parents, the age group of children and two dummy variables indicating the presence of related or unrelated people in the household. These two indicators enable us to refine family categories and distinguish between census families that live alone in their homes and those who are part of an extended household. The number of children is not included because we use a family income measure that has been adjusted for family size[2]. Along with income, parental education and labor market activity describe the current socioeconomic status of families. Housing is addressed through residential mobility and tenure.

A single composite variable takes into account the numerous ethnocultural traits of families. Since the variables *language(s) spoken at home*, *country of birth*, *year of immigration* and *visible minority group* are all strongly correlated in Montréal, the creation of a composite variable allows for the identification of major archetypes while avoiding problems of strong multicolinearity. Such a categorization clearly overlooks the heterogeneity of birth regions or visible minority groups, but the exploratory nature of our approach and the inclusion of interaction terms between ethnocultural, demographic and socioeconomic aspects of family identity dictate to some extent this (over)simplification.

Our first ethnocultural group consists of families who only speak French at home, who do not belong to any visible minority group, and who are not immigrants. To simplify, we will refer to them as *Francophones* from now on, even if many French-speaking families are not part of this group. Similarly, by *Anglophones* we mean white, non-immigrant families who speak only English at home. The third group, *Visible Minorities*, includes all non-immigrant families belonging to any visible minority group, no matter what their home language is. Although the size of this group is not very large, it's interesting to be able to compare its spatial assimilation to that of other groups. Under the label *Old Immigrants*, we regroup families who immigrated in 1996 or earlier and who are not part of a visible minority group. The next group, *Recent Immigrants*, is more representative of what is often called the *new* immigration: immigrants who arrived after 1996 and are part of a visible minority group. The sixth and final group includes all families that are not circumscribed by the above criteria. Note that in two-parent families, the definition criteria apply equally to both parents; exogamous couples are as a result relegated to this last category, *Others*.

[2]Adjusted income takes into account the pooling of resources and the economies of scale made by people living together. It enables the comparison of families with different numbers of parents and children. The total census family income was divided by the equivalence scale used by Statistics Canada to determine low-income status. This scale is the sum of weights attributed to all family members. The first parent is attributed a weight of 1 and the other parent (in two-parent families) or the first child (in single-parent families) a weight of 0.4. All other children receive a weight of 0.3.

Results

Family type segregation

Maps 1, 2, and 3 respectively present the spatial distribution of married, cohabiting, and single-parent[3] families in the CMA of Montréal. In opposition to what we had projected, we find that married families are overrepresented (in red) in neighborhoods that are close to the city center. They are underrepresented (in blue) in most of the peripheral areas. The distribution of married families is in fact closely related to the known distribution of English-speaking (Apparicio and Seguin 2002) and immigrant populations (Apparicio et al. 2006).

Map 2, which displays the same indicators for cohabiting families, is almost the exact opposite of the previous map. Neighborhoods where these families are overrepresented are mostly situated in quite distant suburbs, although they're also found on the Island of Montréal, along a main subway line. Again, this distribution is very similar to that of the French-speaking population (Apparicio and Seguin 2002).

The spatial distribution of single-parent families (map 3) is less easy to analyze along ethnic lines. If they are obviously overrepresented in the inner city, we also find them much further, in the center of some suburban municipalities. However, they are underrepresented in wealthier areas of the city center (Westmount, Town of Mount-Royal, etc.), in most of the English-speaking West Island, and in the periphery. The spatial distribution that most closely resembles that of single-parent families is that of low-income households (Apparicio et al., 2008).

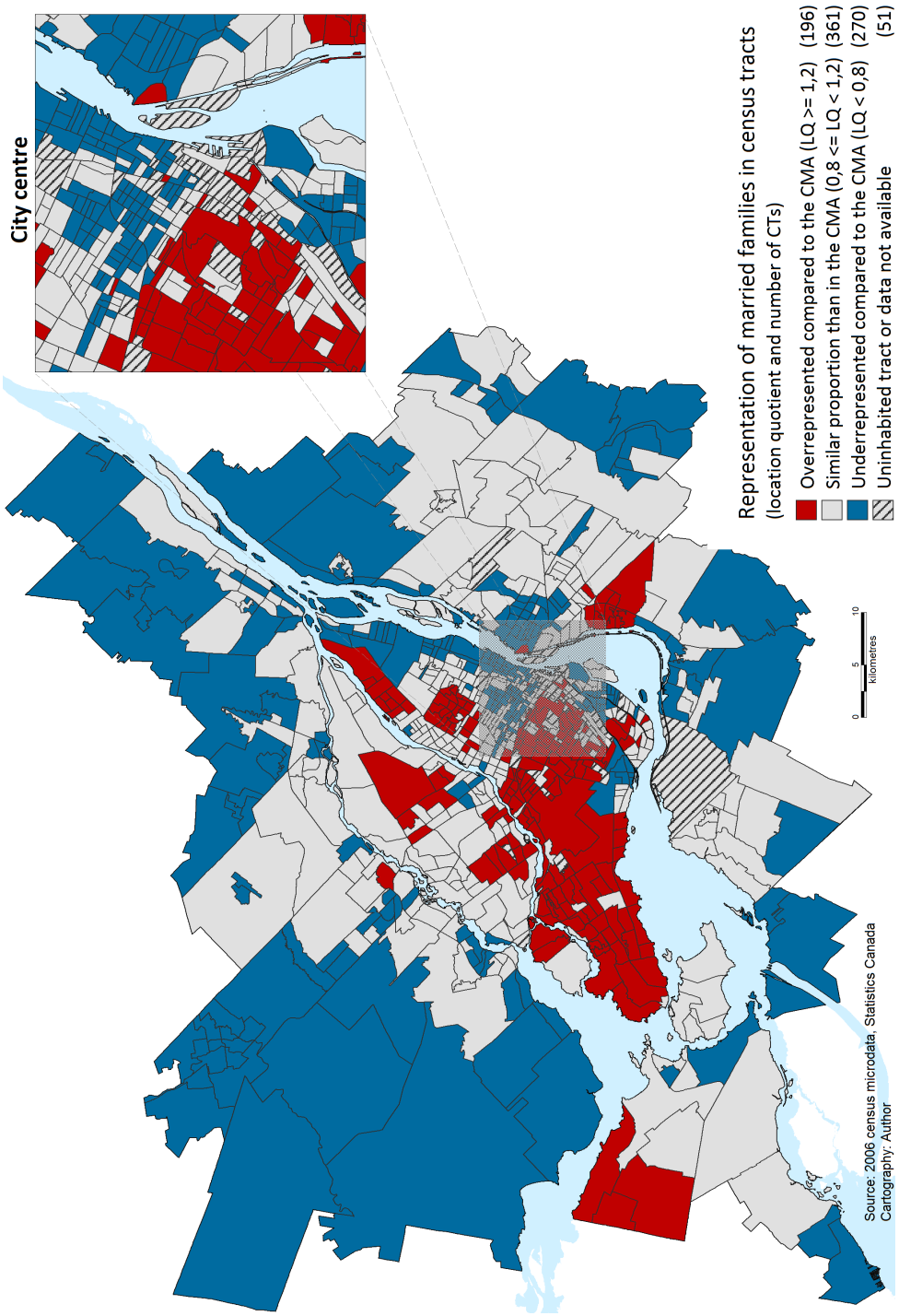
If these maps seem to indicate very large spatial differences, the dissimilarity index at the top of Table 1 reminds us that family-type segregation levels are altogether moderate. With values around 0.30, these indices are close to values obtained for children of single parents in 1980s' U.S. cities (White 1987). They are obviously well below the 2000 levels seen in American cities for white/black segregation (0.68), but they are not that far below white/Asians segregation levels (0.40) (Charles, 2003). In Montréal, family-type segregation is much lower than Anglo/Franco (mother tongue) segregation (0.57) but closer to immigrant segregation (0.41), and very similar to low-income segregation (0.34).

Although no single pair of family types stands out, note that the most dissimilar spatial distributions are those of married and cohabiting families (0.34). More than a third of these families would have to change neighborhood for them to be evenly distributed across the city. The pair made up of both types of single-parent families shows the lowest dissimilarity (0.26).

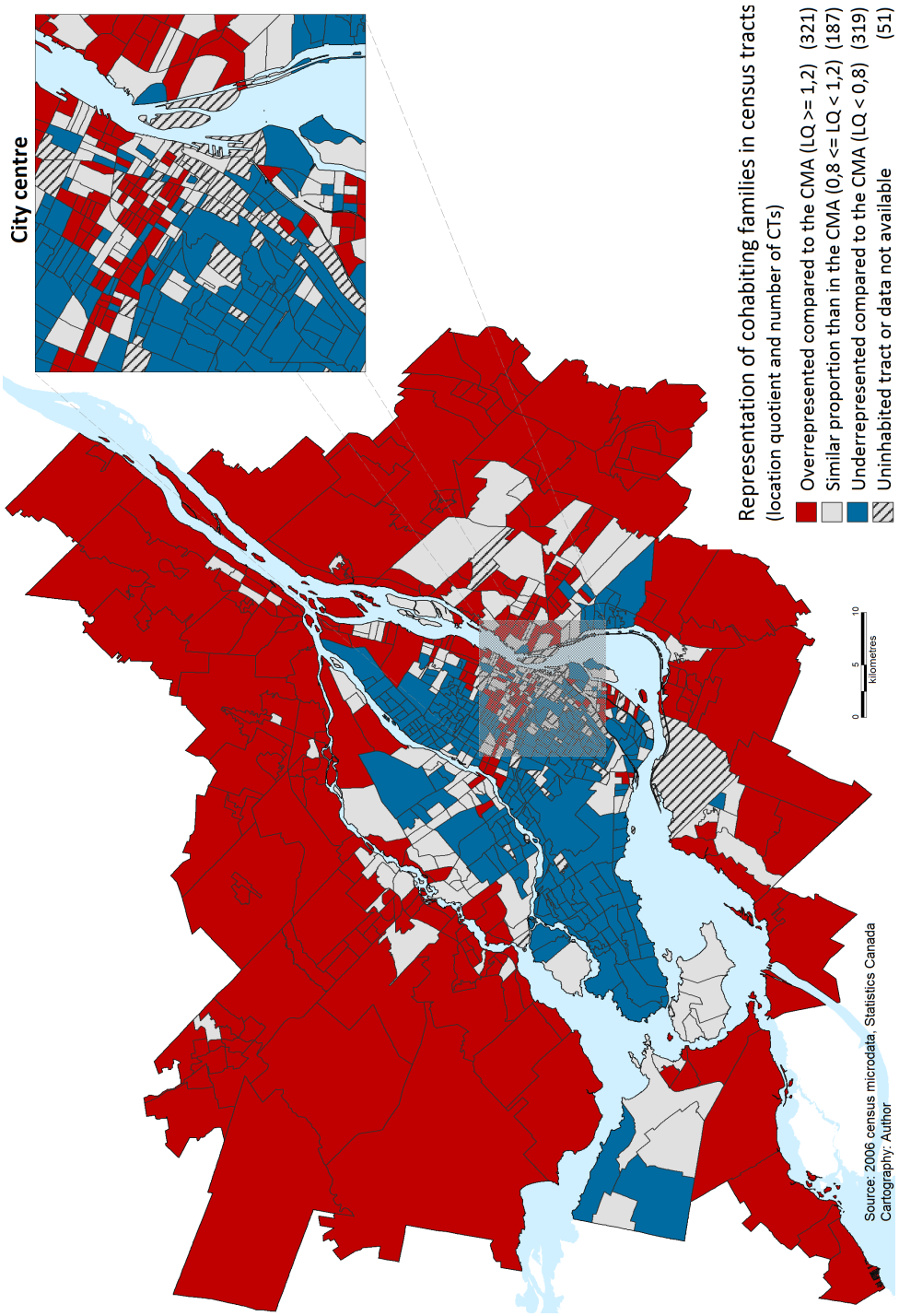
As does the index of dissimilarity, the indices of interaction and isolation of Table 1 do not indicate an intense family-type segregation. Of course, a family generally lives in a neighborhood where same-type families are overrepresented,

[3]Single-mother and single-father families have been combined for mapping purposes because the small numbers of families in some census tracts interfered with Statistics Canada's confidentiality policy for census microdata.

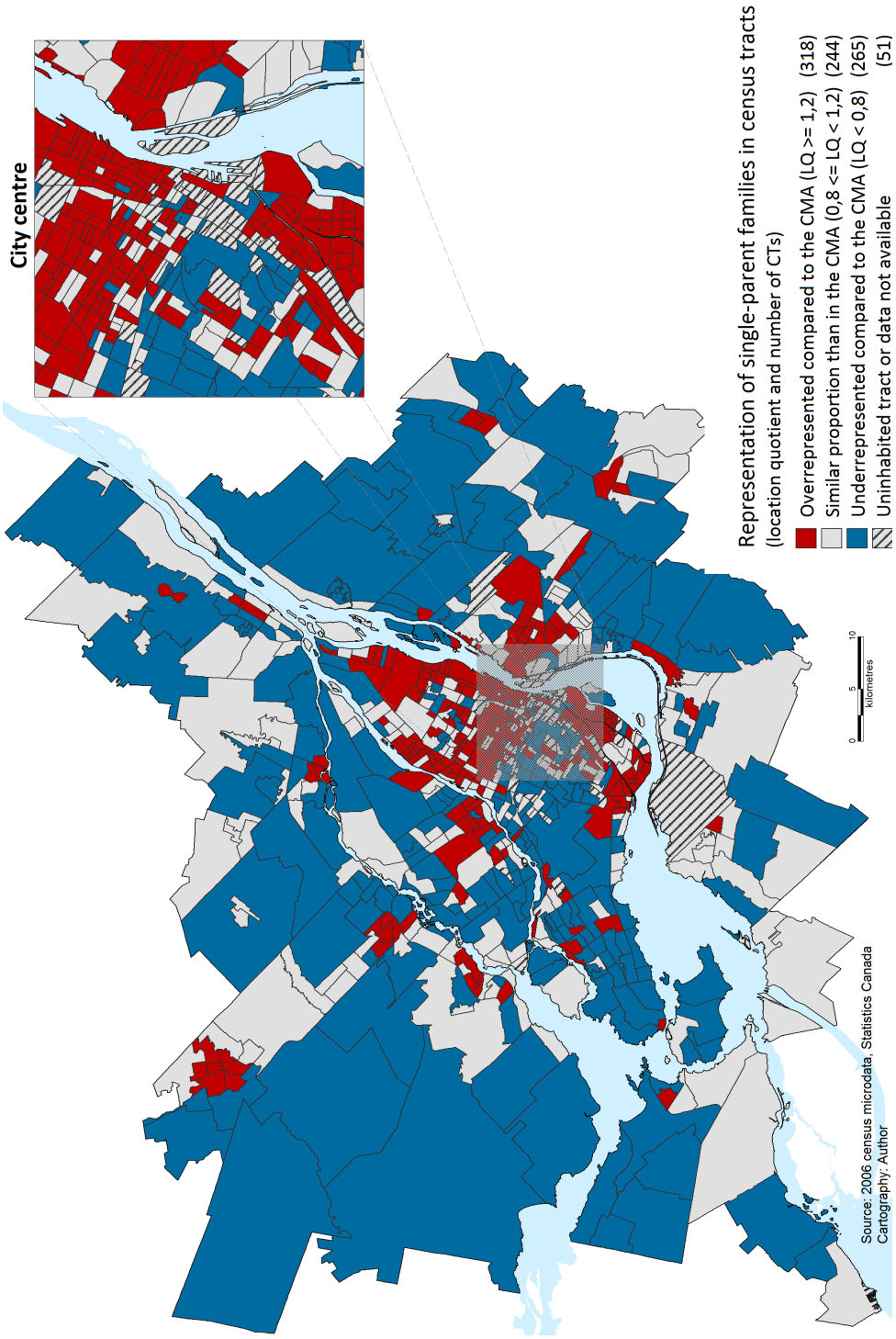
Map 1 : Married families' spatial distribution, CMA of Montréal, 2006



Map 2 : Cohabiting families' spatial distribution, CMA of Montréal, 2006



Map 3 : Single-parent families' spatial distribution, CMA of Montréal, 2006



while the other family types are underrepresented. But levels of interaction witnessed do not suggest that families of different types are isolated in absolute terms. An average married family, for instance, whose group represents 50.9 % of the CMA's families, lives in a neighborhood where 56.1 % of all families are also married, 21.8 % are cohabiting families (24.5 % in the CMA as a whole), 17.9 % are single-mother families (19.5 % in the CMA) and 4.2 % are single-father families (4.6 % in the CMA). All exceptions to this rule concern single-father families. These families are slightly more exposed to cohabiting and single-mother families than their proportion in the CMA would suggest. Note also that cohabiting families are the ones least exposed to married families which confirms the results from the maps and the dissimilarity index.

Table 1 : Segregation indices by family type, CMA of Montréal, 2006

a) Dissimilarity Index

	Two-parent		Single-parent	
	Married	**Cohabiting**	**Female**	**Male**
Two-parent married	—	—	—	—
Two-parent cohabiting	0.34	—	—	—
Single-parent female	0.28	0.32	—	—
Single-parent male	0.31	0.27	0.26	—

b) Interaction/Isolation Index[a]

Exposure group	Two-parent		Single-parent	
	Married	**Cohabiting**	**Female**	**Male**
Two-parent married	0.561	0.446	0.470	0.463
Two-parent cohabiting	0.218	0.318	0.239	0.267
Single-parent female	0.179	0.187	0.241	0.208
Single-parent male	0.042	0.049	0.049	0.063
Proportion in the CMA	0.509	0.249	0.195	0.046

[a] The shaded diagonal corresponds to to isolation index, i.e. interaction with one's own group.

Even though it is not extreme, there is a significant heterogeneity in the spatial distribution of families with children in the CMA of Montréal. At this stage of the research however, it is not clear whether this heterogeneity arises from family type per se or stems from compositional differences. We have yet to identify family and neighborhood characteristics, and to isolate the influence of multiple factors by a locational attainment analysis.

Sample description

Although they are quite spatially separated, married and cohabiting families live in neighborhoods where the median household income is on average about the same (58,000 $). Surprisingly enough, they achieve this same average while

Table 2 : Family characteristics by family type, CMA of Montréal, 2006 (in percentage unless otherwise stated)

	Two-parent		Single-parent		Total
	Married[a]	**Cohabiting**	**Female**	**Male**[b]	
Neighborhood income ($)	57,977	58,139	48,741***	*52,901***	55,982
Mean age of parents (years)	41.0	37.7***	39.0***	*42.8****	39.9
Age group of children					
All < 6 y.o.	23.1	35.3***	17.3***	*13.0****	24.5
Some < 6 y.o., some ≥ 6 y.o.	17.2	16.6*	10.4***	*5.4****	15.2
All ≥ 6 y.o.	59.7	48.2***	72.3***	*81.7****	60.3
Presence of a related person					
At least one	6.2	4.0***	12.4***	12.3***	7.2
Presence of an unrelated person					
At least one	0.7	0.7	6.2***	*8.9****	2.2
Adjusted family income ($)	35,862	36,793***	20,504***	*27,779****	32,727
Parents' education					
Low	4.7	5.5***	18.2***	*16.3****	4.9
Intermediate	28.3	36.9***	41.9***	42.8***	31.1
High	67.1	57.6***	39.9***	40.9***	64.0
Parents' labor market activity					
Low	7.3	3.5***	23.6***	*12.0****	6.1
Intermediate	21.6	15.2***	13.8***	*6.3****	19.5
High	71.1	81.2***	62.6***	*81.7****	74.4
Tenure					
Homeowners	72.9	73.9*	36.0***	*52.7****	65.0
Residential mobility					
Same address for at least 5 years	55.5	45.7***	43.1***	*48.5****	50.3
Old mobility (> 1 year but < 5 years)	33.7	40.5***	39.0***	*35.9**	36.5
Recent mobility (≤ 1 year)	10.8	13.8***	17.9***	*15.6****	13.1
Ethnocultural group					
Francophones	32.7	75.0***	53.3***	*63.3****	48.7
Anglophones	6.8	1.6***	5.6***	5.1***	5.2
Visibles Minorities	0.3	0.3	3.3***	*2.4****	1.0
Old Immigrants	5.5	0.5***	5.0†	5.3	4.1
Recents Immigrants	8.9	0.6***	6.5***	*3.8****	6.1
Others	45.8	22.0***	26.3***	*20.2****	34.9
N	224 315	109 815	85 840	20 335	440 305

**** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.1$*

Note : Percentage totals for a variable's categories might be different from 100 % since proportions were calculated from rounded cell counts.

[a] Married families are the baseline category for statistical significance tests represented as stars.

[b] Italicized single-father parameters are significantly different ($p < 0.05$) from single-mother's.

having very dissimilar profiles. Married families are older (41 vs. 37.7 years old) and live more often with relatives than cohabiting families. They are better educated, but have somewhat lower income and are less active in the labor market. They are also less mobile and slightly less likely to be homeowners. The latter result is quite unexpected given the rates previously discussed for France and Canada, but it is entirely explained by ethnocultural differences. Within each ethnocultural group, cohabiting families are less likely to be homeowners than their married counterparts (not shown). Differences between married and cohabiting families are most pronounced at the ethnocultural level. Less than a third of married families belong to the francophone group, while it's the case of three-quarters of cohabiting families! In other cultural groups, cohabiting families are less well represented than married ones, except in the visible minority group that comprises only a small proportion of both types of families.

Taken together, the two types of single-parent families live in poorer neighborhoods than two-parent families. They have older children, live more often with related and unrelated individuals, they are poorer, less educated and less active on the labor market. They are also less likely to own and are more mobile than two-parent families. Their ethnocultural composition is midway between that of married and cohabiting families. There are however several elements that distinguish female-headed families from male-headed ones. The former live in much poorer neighborhoods (48,741 $, i.e. 84 % that of two-parent families) than the latter (52,901 $, 91 %). Female heads have significantly lower income, labor market activity, and homeownership rate than male heads. In terms of ethnocultural composition, we find that single mothers are less likely to be francophones, but more likely to be recent immigrants or visible minorities than single fathers. Interestingly, single mothers and fathers are disproportionately part of the visible minority group. This structural imbalance in what is the first *large* generation of non-white families born in Québec is not unlike the situation of African-Americans.

Often because of small sample size, ethnocultural differences are frequently missing from contemporary Canadian family research. As is apparent from Table 2, ethnocultural composition of family types in Montréal and – just by the demographic weight of the CMA – in all of Québec varies dramatically. Family-type-based analysis that do not control for ethnocultural differences are therefore likely to confuse effects related to family types with effects related to ethnic groups. In the next section we will make an attempt to disentangle those factors.

Neighborhood income

Locational attainment results are presented in Table 3, where, we recall, the dependent variable has underwent a logarithmic transformation. In model 1, which contains only the family type variable, we see that cohabiting families

Table 3 : Locational attainment models, median household income of neighborhoods, CMA of Montréal, 2006

	Model 1	Model 2	Model 3
Intercept	10,895***	11,005***	11,021***
Family type			
[Married][a]	—	—	—
Cohabiting	0.024*	-0.022***	-0.033***
Single-mother	-0.160***	0.001	-0.021**
Single-father	-0.078***	-0.003	-0.023**
Mean age of parents		-0.002***	-0.002***
Age group of children			
All $<$ 6 y.o.		-0.040***	-0.038***
Somme $<$ 6 y.o., some $\geq$ 6 y.o.		-0.007	-0.006
[All $\geq$ 6 y.o.]		—	—
Presence of a related person		-0.019***	-0.018**
Presence of an unrelated person		-0.002	-0.005
Parents' education			
Low		-0.061***	-0.069***
Intermediate		-0.020***	-0.024***
[High]		—	—
Parents' labor market activity			
Low		-0.011	-0.011
Intermediate		0.016**	0.013**
[High]		—	—
Adjusted family income		0.122***	0.090***
Adjusted family income (squared)		0.026***	0.030***
Tenure			
[Owner]		—	—
Renter		-0.307***	-0.305***
Residential mobility			
[Same address for at least 5 years]		—	—
Old mobility ($>$ 1 year but $<$ 5 years)		0.032***	0.033***
Recent mobility ($\leq$ 1 year)		0.048***	0.050***
Ethnocultural group			
[Francophones]		—	—
Anglophones		0.045*	0.027
Visible Minorities		-0.042**	-0.024
Old Immigrants		-0.084***	-0.106***
Recents Immigrants		-0.172***	-0.179***
Others		-0.067***	-0.088***
Family type X Ethnocultural group			
Cohabiting X Anglophones			0.004
Cohabiting X Visibles Minorities			-0.023
Cohabiting X Old Immigrants			0.046
Cohabiting X Recent Immigrants			0.001
Cohabiting X Others			0.045***

Continued on next page

Table 3 : Locational Attainment Models for Neighborhood Median Household Income – CONTINUED

	Model 1	Model 2	Model 3
Single-mother X Anglophones			0.028
Single-mother X Visibles Minorities			-0.020
Single-mother X Old Immigrants			0.022
Single-mother X Recent Immigrants			0.063***
Single-mother X Others			0.015
Single-father X Anglophones			0.002
Single-father X Visibles Minorities			-0.058
Single-father X Old Immigrants			0.052†
Single-father X Recent Immigrants			0.034
Single-father X Others			0.045**
Family type X Ethnocultural group X Family income			
Married X Anglophones			0.040
Married X Visibles Minorities			0.074†
Married X Old Immigrants			0.034†
Married X Recent Immigrants			0.062***
Married X Others			0.074***
Cohabiting X Francophones			-0.025**
Cohabiting X Anglophones			0.009
Cohabiting X Visibles Minorities			0.095†
Cohabiting X Old Immigrants			0.072*
Cohabiting X Recent Immigrants			0.046†
Cohabiting X Others			0.010
Single-mother X Francophones			-0.006
Single-mother X Anglophones			0.045†
Single-mother X Visibles Minorities			0.026
Single-mother X Old Immigrants			0.013
Single-mother X Recent Immigrants			0.073***
Single-mother X Others			0.040**
Single-father X Francophones			-0.013
Single-father X Anglophones			-0.008
Single-father X Visibles Minorities			-0.022
Single-father X Old Immigrants			0.010
Single-father X Recent Immigrants			0.105*
Single-father X Others			0.091***
$\mathbf{R^2}$	0,0342	0,3418	0,3464
N	440 080	440 080	440 080

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.1$

[a] The baseline category of each variable is in *[italics]*.

live in slightly more affluent neighborhoods than married families [4]. Single-parent families, especially single-mothers, live in much poorer neighborhoods. Family type alone explains 3 % of the total variance.

The second model introduces control variables corresponding to demographic, socioeconomic, housing and ethnocultural characteristics. On the one hand, compositional differences seem to fully explain the neighborhood income gap between married and single-parent families found in the first model. Indeed, the predicted neighborhood income of the latter is not significantly different from that of the former. On the other hand, the sign of cohabiting parents' coefficient is reversed when compared to Model 1; with equal characteristics, they now appear to live in slightly poorer neighborhoods than married families.

As expected, the coefficients of ethnocultural variables are all significant and their values are quite high. Anglophones are the most advantaged, followed by francophones, visible minorities, old immigrants, and far behind by recent immigrants. As the *others* group consists of multilingual natives, exogamous couples and various categories of immigrants, it is appropriate that its coefficient lies between those of non-immigrant and immigrant groups.

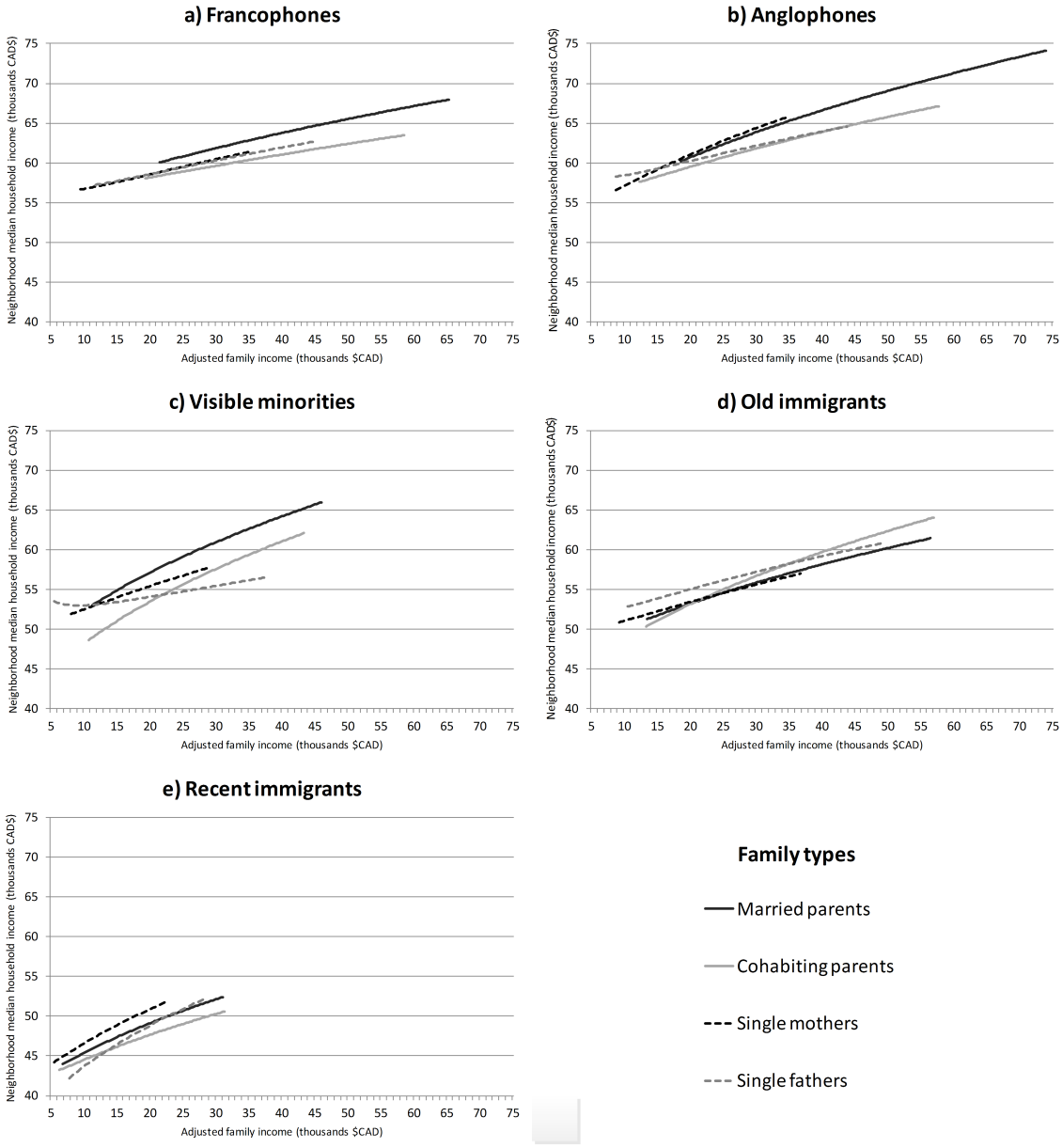
Since Model 2 does not include any interaction terms, we're making the assumption that family type differences are constant regardless of other variables' value. Reality being inevitably more complex than that, we will try to approach it further by introducing interaction variables between family type, family income and ethnocultural group in the third model.

In Model 3, coefficients of variables not involved in an interaction remain essentially the same as in the previous model. As for the three interacting variables, their coefficients become pretty unintelligible in this tabular format. Their interpretation is better served by a comparison of predicted values. Figure 1 presents the prediction curves by dividing them into five graphs, one for each ethnocultural group. The vertical axis of each graph represents the neighborhood income and the horizontal axis, the family income. The represented curves cover a range going from the 10^{th} to the 90^{th} percentile of the observed adjusted family income of each subgroup. All predicted values are only valid for families with mean-aged parents and baseline characteristics.

As all graphs in Figure 1 are on the same scale, it is easy to see that for each subgroup a better family income means a wealthier neighborhood, but that the intercept and the rate of increase vary greatly for one subgroup to the next. Although there are some differences in *spatial returns* between family types, the largest gaps come from ethnocultural differentiation. That is to say that between family types of the same ethnocultural group, location attainment disparities are low. For francophones, whose numbers are greater, most of the differences are however statistically significant. Married francophone families are more likely than other francophone family types to capitalize on their income to

[4] The difference between both family types is significant in model 1 whereas it was not in Table 2. This is due to the transformation undergone by the neighborhood income variable.

Figure 1 : Predicted neighborhood income for 20 family subgroups, by adjusted family income, CMA of Montréal, 2006



Note: The curves extend from the 10th to the 90th percentile of the observed family income of each subgroup.

settle in affluent areas, single-parent families are less able to do so. More surprisingly, cohabiting families are the least advantaged among francophone families. Among recent immigrants, the single-mother family advantage over cohabiting and married families is also statistically significant. Anglophone single-mothers do as well as married anglophone families. In fact, their *performance* is so high that it significantly exceeds that of married francophone families. It's also interesting to note that, for native-born visible minorities, a low family income means residing in a neighborhood as poor as those of old immigrants, but that a higher income brings them closer to the kind of neighborhoods inhabited by native-born whites. Is this the sign of a spatial assimilation in progress?

Within each type of family, the relative order of ethnocultural groups already exposed in Model 2 stays unchanged: With equal family income, anglophones live in more affluent areas than francophones, visible minorities, old and recent immigrants. This corresponds pretty well with the order that would be predicted by spatial assimilation theory, except for the inequality between both groups of white natives that is more in line with place stratification theory and the social history of Canada. The difference between anglophones and francophones is significant at the 0.05 alpha level for married families and single-mother families, and at the 0.10 level for cohabiting families.

It seems clear, especially from Figure 1, that the locational attainment of family types does not follow any logic that would transcend ethnic groups. There is a strong interaction between family types, ethnocultural and socioeconomic factors, at least for the neighborhood's median household income. While there is no doubt that ethnocultural categories play a key role and that family type has some real importance, the *net effect* of the latter is quite difficult to ascertain.

Conclusion

Although differences between family types are not extremely deep, the conclusions of the locational attainment models lead us to relativize the generalizations that are usually made about the spatial distribution of families. Based on the results of this exploratory analysis, it seems clear that one cannot speak of two-parent or single-parent families as if they were homogeneous groups. The social changes introduced by the *second demographic transition* (van de Kaa 1987), the ethnic diversification of Western populations, and the increasing polarization of social classes and neighborhoods are phenomena that cannot be ignored, nor can their simultaneity.

The marital status of the parental couple, the sex of the single parent, their socioeconomic status, and particularly their ethnocultural identity are all essential factors to consider, but the mere fact of *controlling* for them in a multivariate analysis of family types is probably not always sufficient. The existence of interactions between those variables, that is to say the existence of a cross-segregation, can lead to erroneous conclusions. Without the inclusion of interaction variables (Model 3), we would have concluded from Model 2 that

married and single-parent families are able to attain the same locations with similar socioeconomic characteristics. In the majority group and among recent immigrants, at least, this conclusion is not justified. In terms of spatial assimilation, it would have also been impossible to witness the locational improvement of high earning visible minorities.

It should also be noted that if, in the multivariate models, the residential disadvantage of single-parent families seems somewhat small, it's mainly because these models control for income and tenure and that it is precisely over these two factors that single and two-parent families differ most strongly. In fact, single-parent families are much more economically disadvantaged and much more likely to rent than two-parent families (see Table 2) and, as shown in Map 3, their spatial distribution is homologous to that of the low-income population. The neighborhoods where the children of these families grow up are economically, and probably socially, poorer. Policy initiative to promote homeownership among poor single parents will only be beneficial if they can expect to buy a home in neighborhoods that are not disadvantaged and that best meet their specific needs. As for those needs, the observations made by Rose and Le Bourdais (1986), among other 1980's authors, about the advantages and inconvenient for single-parent families of living in the city center as opposed to the suburbs are by and large still valid today. Accordingly, using an index considering elements of the built environment, density, proximity of services and parks, and access to public transport as a dependent variable, in addition to neighborhood income, might have been more informative than the sole dependent variable used here. To be certain this is a logical extension for future research.

In addition to a chronological study that would describe the transformation of the relationship between city and family over several consecutive censuses, we must also consider comparative synchronous studies. Some of the most interesting observations presented here were made about cohabiting families, but we know that the significance of cohabitation differs widely from one country to another (Dumas and Bélanger 1997; Kiernan 2001; Heuveline and Timberlake 2004). As Québec, with Scandinavian countries, is a leader in this area one could want to know how types of two-parent families fare in societies where cohabitation has not yet reached the same *stage*: Buenos Aires, Philadelphia or even Toronto? And in societies where its character is similar: Stockholm, Oslo or Reykjavik?

Finally, although the scope of this study is limited in terms of indicators, time, and space, some of its observations apply more broadly to all contemporary family research. Disparities highlighted in the descriptive statistics of our sample, for instance, continue to exist no matter if the focus of a study is on residential areas, family disruption or children well-being. If this study demonstrates anything, it's the importance of not considering family types as homogeneous, acultural or aspatial entities.

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Annex A

Three variables combining the characteristics of both parents were created for the simultaneous modeling of families of all types: the `mean age of parents`, `parents' joint education level` and `parents' joint labor market activity`. As its name indicates, the first has been built by averaging the age of mothers and fathers. For single-parent families, it is simply the age of the single parent. The development of the other two variables is somewhat more complex. Figure 2 details the assignment of two-parent families to one of three categories.

Since the individual variables `education` and `labor market activity` have three different levels, the cross tabulation of the father's and the mother's variable creates nine distinct subgroups. For the reconfiguration of these subgroups into three new categories, we used their relationship with the dependent variable. We tried to create categories as homogeneous as possible, but always with a desire to maintain a symmetry between the characteristics of fathers and mothers. Both parents without a degree, for instance, will be commonly classified as a *low* education family (in pale on the left side of Figure 2), while a couple consisting of a parent with a university degree and a parent with a high school diploma will be classified as a *high* education family (dark). Again, things are easier for single parents. The new categories *low*, *intermediate* and *high* correspond respectively to old categories *no degree*, *high school / vocational training* and *community college / university* for education, and *has not worked*, *worked mainly part-time weeks* and *worked mainly full-time weeks* for labor market activity.

Although this approach is debatable, we believe it enable us to fully take into account the characteristics of two-parent and single-parent families in the same model. It also avoids the problems caused by the high correlation between partners' characteristics. One main drawback however is that the symmetry father/mother of its construction does not allow the contribution of mothers and fathers to be separately evaluated, but then again the same is true of other strategies currently employed.

Figure 2 : Synthesis of two-parent families common variables' creation

Classification (with average neighborhood income and weighted sample size)

Highest degree earned (father) / Highest degree earned (mother)

	1	2	3
1	45 966 $ 16 510 couples	50 689 $ 13 230 couples	50 467 $ 16,4 km 4555 couples
2	53 078 $ 15 125 couples	55 278 $ 63 185 couples	58 282 $ 32 385 couples
3	56 206 $ 7830 couples	59 365 $ 43 535 couples	61 861 $ 137 775 couples

Labor market activity (father) / Labor market activity (mother)

	A	B	C
A	40 884 $ 14 120 couples	45 600 $ 4090 couples	55 275 $ 53 860 couples
B	48 781 $ 2130 couples	51 801 $ 3330 couples	60 894 $ 50 400 couples
C	50 482 $ 7935 couples	52 088 $ 7280 couples	60 359 $ 190 995 couples

Legend

Original variables' categories

`Highest degree earned:`
1 No degree
2 High school / Vocational training
3 Community college / University

`Labor market activity:`
A Has not worked
B Worked mainly part-time weeks
C Worked mainly full-time weeks

New variables' categories

`Parents' joint education level` and
`Parents' joint labor market activity :`

Low

Intermediate

High