

French Connections – Examining the Residential Clustering and Dispersion of Francophones in the Toronto Area

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1 ABSTRACT

Toronto is known as a city of neighbourhoods, many of which are defined by the cultural origins and traditions of immigrant groups. Examples of official or unofficial neighbourhood names include Chinatown, Koreatown, Little Tibet, Gerrard India Bazaar, Corso Italia, Little Portugal, Greektown, and more. Other major immigrant groups such as Scandinavian, German, and French are notably absent from the place names in Toronto and other major global cities, and we wanted to examine whether this reflects different patterns of residential clustering and dispersion. We chose to analyze the Francophone population in the Toronto metropolitan area, since French is an official language of Canada as well as being spoken by a number of different immigrant groups, which allows for comparisons of both, language and culture as a factor in settlement decisions. We found that French speakers, including those born in Toronto as well as intra-Canadian migrants, tend to live in clusters, while none of the individual Francophone immigrant groups examined in this research are clustered at a statistically significant level. Based on this finding, language rather than culture is a key factor in residential location decision-making.

Keywords: Language, Clustering, Spatial Analysis, Settlement, Immigration

2 INTRODUCTION AND RESEARCH CONTEXT

Cluster analyses of the settlement patterns of specific ethnic groups within cities are few and far between. However, analyses of populations at larger scales and relating to concentrations rather than clustering are more common. Ethnic neighbourhood analysis has been conducted in many of the world's most notable cities, including Toronto. This field of study tends to concentrate on the factors that lead to settlement decisions. Factors such as pre-existing concentrations (Gross & Schmitt, 2003), mnemonic institutions (Harold & Fong, 2018), economic standing and resources (Fong & Chan, 2010) have all been covered in Toronto. Gross & Schmitt found that pre-existing ethnic clusters of settled immigrants were considered strongly in settlement decision-making of newly landed immigrants. Another study identified mnemonic institutions (institutions which related to collective memory) such as religious centres of gathering, to contribute to ethnic cluster growth. For example, Harold & Fong found that higher concentrations of Jewish residents were found near synagogues and Jewish community centres. More traditional schools of thought on ethnic settlement, such as the spatial assimilation model developed by the Chicago School of Ecology tied settlement patterns uniquely to economic opportunity. The model indicates “that immigrants first concentrate spatially in older, less-expensive housing close to the centre of the city and, upon improving their economic status, move outwards through increasingly higher-status residential zones, ultimately ending up at the urban periphery” (Murdie & Ghosh, 2010). Fong and Chan's study expands on this model, suggesting that economic opportunity is one of three main factors, the other two being ethnic information sources (ethnic community centres and real estate agents) and ethnic resources (help and advice from community members).

In contrast to spatial assimilation, the heterolocalism model sees “communities without propinquity” as a possibility (Zelinsky & Lee, 1998). This model infers that a community does not need to live together spatially as their interactions could happen at ethnic centres between communities. The Price et al. (2005) study of Washington DC found that ethnic groups did not always follow the traditional spatial assimilation concept. They noted instead that cities exemplified numerous paths to settlement with different results, ranging from the traditional perspective to a new one where ethnic community members could relate to each other via ethnic institutions. This echoes Qadeer and Kumar's (2006) sentiment that “mere living side by side...does not make an ethnic neighbourhood”. In all of these scenarios, the study subject were distinct ethnic groups. In the present study of French-speaking people, there may be a variation of both models at play, perhaps depending on other factors. Literature regarding French-speakers in Toronto and their spatial

residential distribution is scarce. Francophones in Toronto come from various ethnic backgrounds, income levels, religions, etc. so it is expected that their spatial relationships will be complex and multifaceted.

On the other side of the spectrum, cities, rather than people, have been analyzed to understand how they accept newcomers. Gateway cities in immigrant-receiving countries like Canada, the US and Australia have all been studied to understand why these cities attract mass immigration (Gross & Schmitt, 2003). Each city, province/state and country are different in their immigration history and policy (Bauder & Sharpe, 2002). These may govern how settlement patterns at every level of geography may manifest themselves. The city of Washington had a simple colonial cultural makeup until the late 20th century (Price et al. 2005). Thus it would not be surprising that its immigrant population composition and spatial distribution differs from that of e.g. New York and Los Angeles in the US (Logan, Zhang, & Alba, 2002) or Toronto in Canada. New York's demographic distribution has emerged over several hundred years. Like Toronto, it has been the home of various European immigrants (Italians, Irish, Dutch, etc.), but more recently, it received more diverse migrants. Los Angeles, on the other hand, like Vancouver, has been built more on a foundation of Asian immigration but differs from the Western Canadian city in its massive acceptance of Latin Americans, due to its proximity to the Mexican border (Logan, Zhang, & Alba, 2002). Unlike the aforementioned cities, Toronto is located in Eastern Canada, which has French and English as official languages. As the largest city in the country, it is not surprising that it has a sizeable French-speaking population, but it is still dwarfed by Ottawa's and Quebecois cities' Francophone populations. According to the Ontario Office of the Commissioner of Official Languages, 42,7% of Francophones in Ontario resided in Ottawa in 2016, while only 19% were in Toronto, and another 20.7% were spread across Northeastern Ontario in smaller communities like Timmins. Ottawa's Francophone population is twice the size of Toronto's, despite Toronto's CMA total population being almost 5 times that of Ottawa (Statistics Canada, 2019a). So despite, Toronto's size, the influence of the French language on the city is felt far less than other Canadian cities. This could possibly push Francophones residing in Toronto to stay together, as they are a minority.

While similarities exist between large American and Canadian cities, research shows vast differences as well. Many studies focus on the segregation of minorities in the US, most notably blacks (Price et al., 2005). Even though in Canada such segregation does not occur to the same extent, many Canadian cities like Toronto are home to large ethnic enclaves (Bauder & Sharpe, 2002). The terminology used to designate ethnic neighbourhoods relates to the freedom that people have in regard to their housing situation, and what the future may hold for them. Ghettoization refers to the residential segregation of populations who are not be able to relocate. Enclaves, on the other hand (following the rationale of the spatial assimilation model), act as a place for an ethnic group to remain until they inevitably attain the economic capital to move on to better housing (Logan, Zhang, & Alba, 2002). When analyzing a group like Francophones in Canada, this is important to keep in mind as lower-income Francophones may reside in enclaves but will likely be able to move away eventually. On the other hand, higher-income Francophones may have enough capital to choose their residences more freely. Thus, economic differences between different subgroups of Francophones may result in spatial clustering or the lack thereof, with some subgroups living in ageing, more affordable housing and others in better kept, more expensive housing. Another significant difference between large American and Canadian cities, and more specifically Toronto, are the areas in which different income classes settle. In the US and some Canadian cities, the suburbs are usually more affluent and homogenous, while inner cities are typified as less safe, cheaper to live in, and dominated by minority groups (Logan et al., 2002; Bauder & Sharpe, 2002). In contrast, some of Toronto's highest value property is just outside of the Central Business District (CBD), like in the Rosedale neighbourhood. Furthermore, many ethnoburbs have sprouted along the edges of Toronto, such as Indian neighbourhoods in Brampton and Chinese in Markham (Murdie & Ghosh, 2010). While these suburbs are often middle-income neighbourhoods, the majority of Toronto's lower-income neighbourhoods are found outside of the CBD in the inner suburbs. Gentrification has also played a large part in changing the traditional view of settlement patterns in cities. Immigrant enclaves across the city of Toronto, which were once settled due to being cheaper housing opportunities, are being filled with educated high-income professionals. Murdie & Ghosh (2010) have found that this has led certain immigrants to avoid the traditional settlement patterns and to settle directly into the suburbs. Some studies found similar results in the US, declaring that in some cases, lower-income residents were forced to relocate as a result of increasing costs in their own neighbourhoods (Vicino, Hanlon, & Short, 2011). As a result of these processes, higher-income Francophones such as native-born Canadians or immigrants from industrialized

countries may settle in different areas than those from developing nations, who may not have the resources to live with other Francophones. Poorer Francophones may thus find themselves clustered together in ethnic enclaves, away from more affluent Francophone communities.

Within the Francophone community are many ethnic variations. An infographic from the Office of the Commissioner of Official Languages (2019) revealed that 58% of Franco-Ontarians were born in the province, that 25% came from other Canadian provinces or territories, and the remaining 17% was comprised of foreign-born immigrants. Within this immigrant population was a relatively even split between continents, with 17% coming from the Americas, 27% coming from Europe, 20% coming from Asia and a slightly larger 37% coming from Africa. Many of the immigrants coming from outside of Europe are immigrating from former French colonies. These include but are not limited to Algeria, Djibouti and the Democratic Republic of the Congo (DRC) in Africa, Vietnam and Syria in Asia, and French Guyana, Haiti and the state of Louisiana in America. One can notice that these various countries may vary significantly in race, culture, language and religion, even within the same continent. As observed by Fong & Harold's (2018) analysis of mnemonic institutions, and more specifically, institutions tied to religion, we can assume that different Francophone people may distribute themselves spatially based not only on race and language but also religion. The religious beliefs of some Francophone subgroups may draw them to churches, mosques, synagogues, temples or community hubs associated with their beliefs like community centres. Some may even prioritize minimal distances to these institutions over proximity to other settlers with a common language or geographical origin. Furthermore, specific subgroups may conscientiously avoid each other due to religious beliefs. In their analysis of Jews in Toronto, Fong & Harold (2018) found that Jews and Muslims would not be found in large concentrations in the same neighbourhoods, instead choosing to co-exist with other groups such as Catholics. This effect may be more apparent between two groups from different regions like Israeli Jews and Saudi Muslims but could also occur to different religious groups coming from the same country. North African countries, in particular, have seen a mass exodus of a large Jewish population following independence movements and their newly installed Muslim governments (Gruen, 1994).

In other cases, the existence of established language-based communities may separate people rather than cluster them. The city of Montreal is well known to have established French-speaking and English-speaking neighbourhoods. Because of this, Hiebert (2000) discovered that specific immigrant populations would unintentionally segregate themselves from one another upon arrival in Canada, even if coming from the same regions. In Montreal, Jamaican immigrants, who speak English, moved into established English-speaking neighbourhoods while Haitian immigrants, who speak French, moved into French areas (Hiebert, 2000). Algerians, one of the test groups for this study, were also observed to move into French-speaking parts of the Quebecois city, possibly due to fewer language barriers and thus better integration (Manai, 2015).

As previously mentioned, 83% of Francophone residents of Ontario are born within Canada. Unfortunately, there are no detailed data on the birthplaces of this population for recent time frames. While Toronto is very often seen as a gateway for international immigrants, it could also be one for inter-provincial migration. Langlois's 1993 study on Quebec and Ontario's inter-provincial migration revealed that in 1986, 672 Ontarians emigrated to Quebec, consisting of 271 Anglophones, and 305 Francophones, with an additional 39 being bilingual. However, 1616 Quebecers moved to Ontario in that same year; 862 Anglophones, 492 Francophones and 50 bilingual individuals. A few fundamental pieces of information can be pulled from this observation. Francophones are actively leaving Ontario for Quebec, most likely to find a home with an official language they speak, but more Francophones are still leaving Quebec for Ontario, perhaps due to Ontario's economic pull. Also important is to understand that almost twice as many Anglophones leave Quebec compared to Francophones. Langlois cites a 1986 study by Baillargeon in which he writes that Anglophones are 17 times more likely to leave Quebec compared to Francophones, yet the province's Francophone migration patterns reveal a deficit of Francophone migration. In addition to this, Langlois found that two-thirds of the Francophones leaving Ontario for Quebec were born in Quebec. This shows that while Quebec is known to be the French-speaking hub of Canada, non-Quebecois French speakers still make up the vast majority of Ontario's Francophone population (roughly 72% based on Langlois' findings in 1986) (Langlois, 1993). Unfortunately, until data that detail place of birth by province, are publicly available, the detailed spatial distribution of Canadian-born Francophones will remain unexplored.

3 DATA AND METHODS

3.1 Case Study Data

The data for this study were obtained from the SimplyAnalytics (2020) tool. The spatial unit of analysis is the census tract (CT) defined by Statistics Canada, as this is a commonly used level of geography for similar studies and related data would also be available at this level. While the finer dissemination area (DA) level contains more detail, it can also create a mosaic effect that is visually deceptive. Such a high level of detail could also be difficult to map. We do, however, acknowledge that census tract level data average out differences within the tracts, which may increase clustering. The case study data include a Shapefile of the CT boundaries for the Toronto Census Metropolitan Area (CMA).

As shown in Table 1, three categories with several variables from SimplyAnalytics' (2020) Demographic Estimates and Projections (DemoStats) for 2018 were analyzed. The variables obtained were already normalized using total CT populations as the denominator. The first variable is the proportion of population in private households who indicated French as their mother tongue. This variable represents people exclusively based on their common language. If clustering only occurs at this level, we could conclude that the study population clusters based on language.

The second group of variables represent the proportions of household population who are immigrants from a specific country. The countries of origin included in the study are France, Switzerland and Belgium for French-speaking populations from Europe, Morocco and Algeria from (Northern) Africa, and Haiti from the Caribbean. These variables test whether immigrants from the same country cluster together, with other populations from a specific geographical region or not at all.

The third variable aggregates the previous six immigrant groups into a new category that identifies French-speaking immigrants. This variable differs from the first because it does not consider Canadian born French speakers (native Franco-Ontarians or Quebecers). This variable is imperfect as it may miss Francophone countries not included in the specific country variable (such as Cameroon, Americans, etc.), but no pre-existing Francophone immigrant data is currently available.

Also included are two control variables: Chinese immigrants and total immigrants. Chinese immigrants have been shown to cluster in Toronto (Murdie & Ghosh, 2010), so the inclusion of this variable will allow for validation of the methodology as well as aid in the visual comparisons with the study populations. Clustering of all immigrants will be compared with areas in which Francophone immigrants settle to determine whether Francophones simply settle in a similar manner as other immigrants.

Variable	Category	Purpose
French mother tongue % of CT population	Language	Test for clustering based only on language
French immigrant % of CT population	Immigrant country of origin	Test for clustering based on country of origin, immigrant status or language
Swiss immigrant		
Belgian immigrant % of CT population		
Algerian immigrant % of CT population		
Moroccan immigrant % Of CT population		
Haitian Immigrant % of CT population		
Chinese immigrant % of CT population		Control variable
Francophone immigrant % of CT population (combination of first five variables above)	Aggregate immigrant population	Test for clustering based on immigrant status and language
Total immigrant % of CT population		Control variable

Table 1: Normalized variables used in the analysis. Data source: SimplyAnalytics.

3.2 Cluster Analysis Methods

Clustering was analyzed in two stages, at a broader scale and a narrower scale. Using the Spatial Auto-correlation (Global Moran's I) tool in the Spatial Statistics toolbox in ArcGIS, we determined whether there are significant clusters of Francophones, Francophone immigrants and/or immigrants from specific French-speaking countries in the Toronto CMA. The tool returned a report, which included the Moran's I index

score and corresponding p-values. Positive index scores indicate clustering of similar values, and the strength of this clustering, while negative index scores indicate spatial dispersion of similar values. A p-value < 0.05 indicates that the spatial distribution is not random, i.e. it is either clustered or dispersed.

We used contiguity to conceptualize spatial relationships in a way that polygons that share an edge or at least a corner with the target polygon are included in the calculations. The ArcGIS software help recommends this method for scenarios, in which the analyst is “dealing with continuous data represented as polygons,” which applies to this study. However, inverse distance weighting was also tested to see how much the results would be affected by the conceptualization of spatial relationships. Row standardization was enabled in order to avoid polygons with more neighbours being treated differently than those with fewer neighbours (such as those on the edge of the study area).

The second stage of the analysis employs the Hot Spot Analysis (Getis-Ord G_i^*) tool to visualize clustering at a local level. While Anselin Local Moran’s I could have been used for this task, that tool is more suited to finding outliers, a goal that is less relevant to this study. The combination of the two stages of analysis will answer the question of whether any French-speaking groups cluster in Toronto, and if so, where they do.

Since clustering depends on the spatial and numeric distribution of the data, we also provide the total number of people in each group along with the total population of the Toronto CMA for reference. Table 2 reveals that some of the immigrant groups are quite small in comparison to all Francophones as well as the Chinese and total immigrant control variables.

Variable	Number of People in Toronto CMA
# Household Population by Mother Tongue Household Population For Mother Tongue Total Single Response French, 2018	77,049
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Western Europe France, 2018	9,551
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Western Europe Switzerland, 2018	1,888
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Western Europe Belgium, 2018	2,151
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Northern Africa Algeria, 2018	1,761
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Northern Africa Morocco, 2018	4,008
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Caribbean And Bahamas Haiti, 2018	3,317
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant Eastern Asia China, 2018	302,468
# Household Population by Total Immigrants and Place of Birth Total Household Population Total Immigrant, 2018	3,066,986
# Basics Total Population, 2018	6,419,713

Table 2: Case study population groups in relation to total population of Toronto Census Metropolitan Area. Data source: SimplyAnalytics.

4 RESULTS AND DISCUSSION

4.1 Global Cluster Analysis

The results obtained using the contiguity conceptualization can be classified into a few different outcomes. Immigrants from Belgium and Algeria do not cluster in a statistically significant manner. Both groups exhibited very small negative index scores, suggesting a minimally dispersed spatial distribution. French and Swiss immigrant populations were found to cluster at a 95% confidence level (meaning there is a 5% chance that this pattern is not significantly different from random). However, the strength of clustering indicated by the Global Moran’s I score is again minimal. Moroccan and Haitian immigrants were shown to cluster at an above 99% confidence level. However, the level of clustering is still very small with an index score around 0.12 and 0.16. The same applies to the variable that aggregates all immigrant groups into French-speaking

immigrants, with a statistically significant (99%) yet very small index score of 0.08. By contrast, the general French-speaking resident group clusters at the 99% level with a clustering intensity of 0.68, only surpassed by the total immigrant and Chinese immigrant control groups with $I = 0.76$ and 0.82 , respectively.

Groups		Contiguity	Inverse distance
Language	French mother tongue	0.684934**	0.453577**
Countries	French	0.036183*	0.052183**
	Swiss	0.034149*	0.015265**
	Belgian	-0.006484	0.008898
	Algerian	-0.002174	-0.002669
	Moroccan	0.162411**	0.034573**
	Haitian	0.116389**	0.046939**
	Chinese (control)	0.818422**	0.490387**
Immigrant status	French speaking immigrants	0.086070**	0.040065**
	Total immigrants (control)	0.764930**	0.530928**

Table 3: Results of global cluster analysis using contiguity and inverse-distance for spatial neighbourhood definitions. Asterisks mark statistically significant Global Moran's I scores, with * representing a 95% confidence interval and ** representing a 99% confidence interval. Higher positive scores indicate a greater degree of clustering.

These results were mostly consistent with those found using the inverse distance conceptualization. The notable differences include markedly lower index scores for the French mother tongue and the Chinese and total immigrant variables, yet with values of 0.45, 0.49, and 0.53 these groups are still highly clustered at a 99% confidence level. Clustering of French and Swiss immigrants is significant at a 99% level rather than 95% using the inverse distance method, although the index scores remained in the same order of magnitude. Lastly, the score for Belgian immigrant clusters changed from negative to positive, but since it remained extremely close to zero, like the score for Algerian immigrants, this change does not have practical significance.

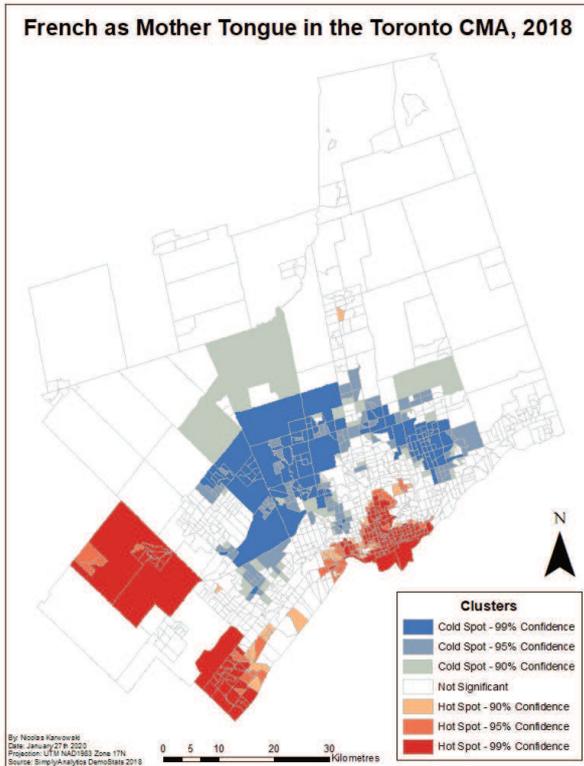
4.2 Local Cluster Analysis

The results of local cluster analysis are shown on the maps in Figure 1. The output feature classes for the Getis-Ord G_i^* tool highlight clusters of high values and low values, known as hot spots and cold spots, respectively. While hot spots of the highest significance (the 99% confidence level) are perhaps of more interest than other ones of lower significance, we will discuss all hotspots above 90% for this analysis, unless they are not part of bigger clusters.

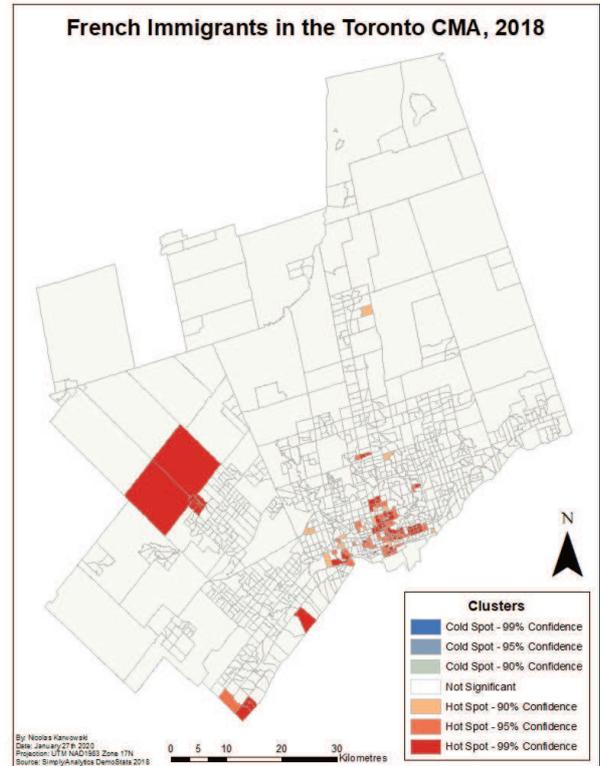
While clustering did not necessarily occur in the same areas for each group, each group did cluster in one or multiple areas of the Toronto CMA. In the six country-specific immigrant variables, clustering occurred in downtown areas as well as suburban areas. However, the mix of clustering between these two areas varied from group to group. Algerians, Moroccans and Haitians (Figure 1e, 1f, and 1g) clustered almost exclusively outside of Toronto's downtown core. Haitians were found in two main clusters on the Scarborough-Pickering border in the East as well as on the Etobicoke-Brampton-Mississauga boundary in the West. The two North African immigrant groups clustered together in North and East York just north of the old city of Toronto, as well as in Oakville on the western extremity of the CMA. The spatial distribution of these North African communities is reminiscent of the Petit Maghreb community in Montreal, where the same immigrant groups clustered (Manai, 2015). While this study does not seek to understand why these groups cluster, this demographic group may possibly stay together based on their common language, religion or geographical region. Based on the spatial assimilation model, there may also be a link between the immigrants' socio-economic status and where they live. Visible minority immigrants have historically had fewer resources than their non-minority European counterparts, leading them to being pushed to the outskirts of the city to find affordable housing (Logan, Zhang, & Alba, 2002).

The three European groups, in comparison, found themselves clustered within the city boundaries as well as in the outer suburbs of the city, with very few residents in the inner suburbs. French immigrants find themselves in a large cluster spanning across the entire core. Another sizable cluster can be seen on the Brampton-Caledon border in the West, while a smaller one was in Oakville in the Southwest. Belgians

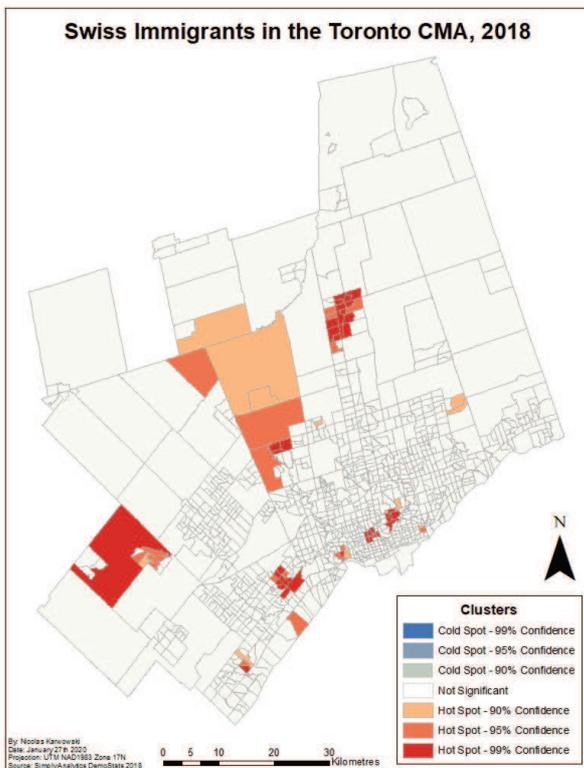
clustered in a slightly smaller area to the east of Yonge Street downtown and along the lakeshore as well as in Vaughan to the North of the city of Toronto. The Swiss were the least clustered of the three, with several small clusters across the CMA. While a Swiss cluster exists in the old city of Toronto, similarly-sized clusters are also seen in Brampton, Newmarket, Vaughan and Mississauga.



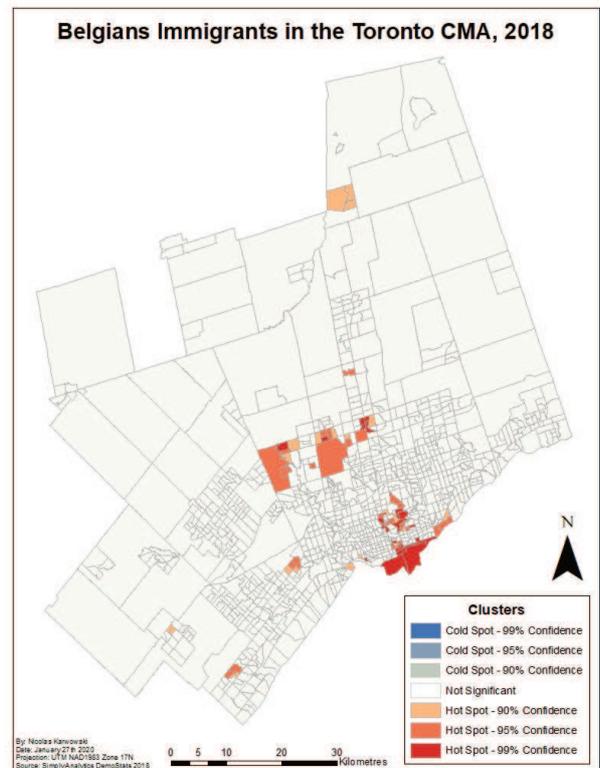
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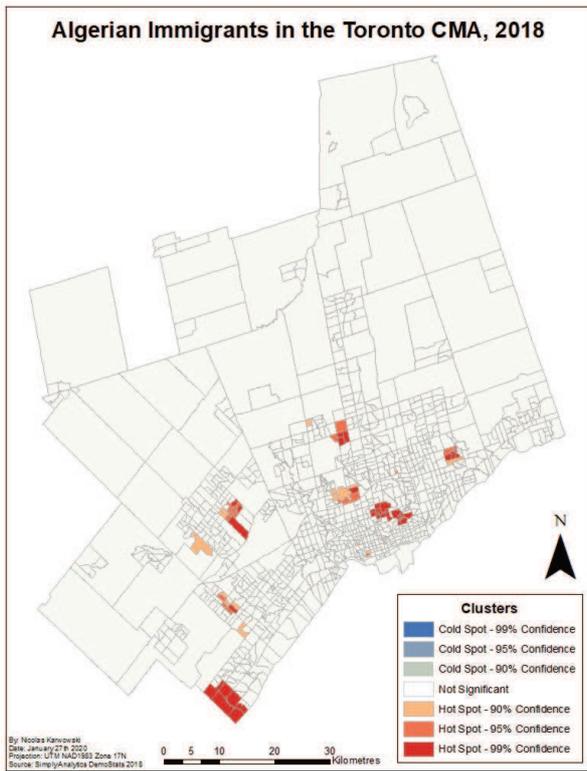
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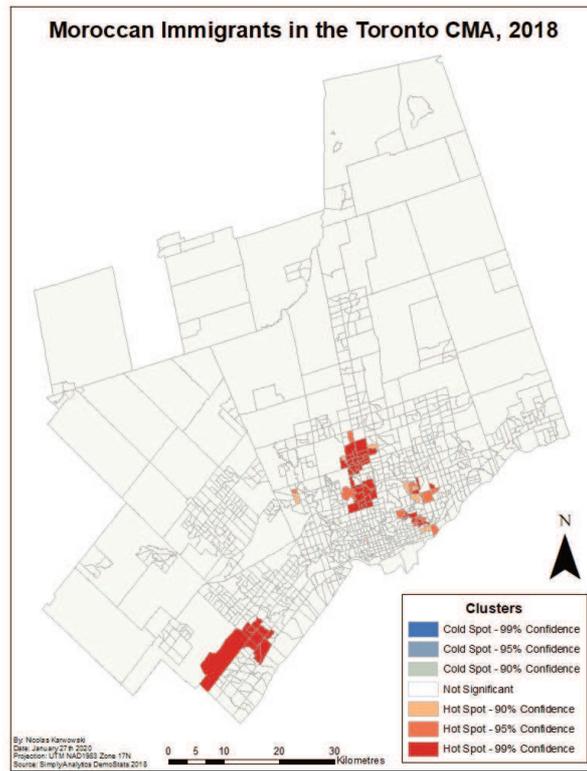
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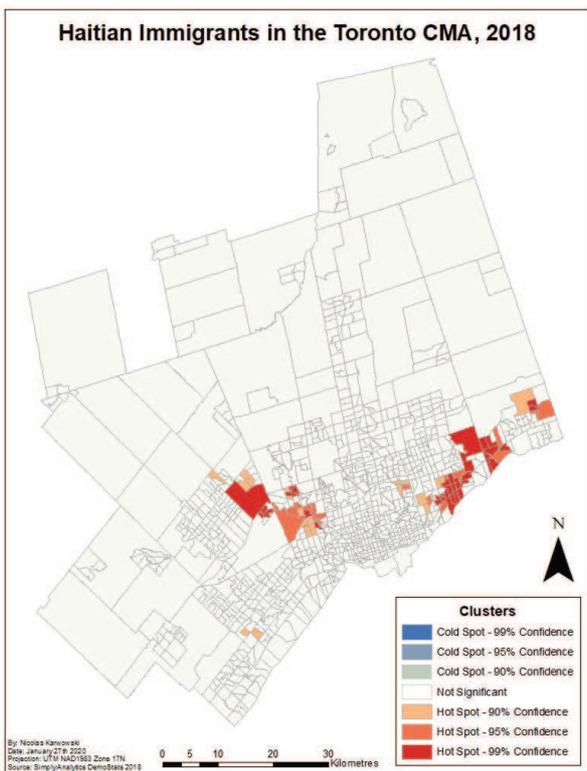
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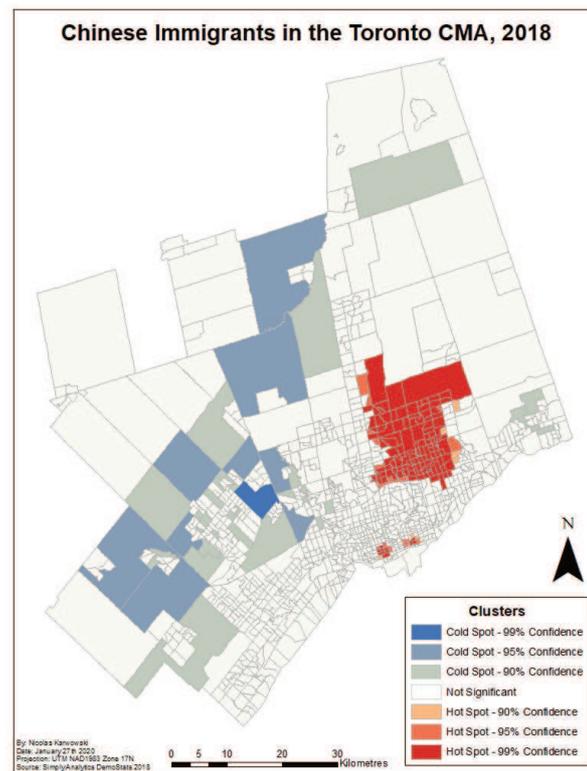
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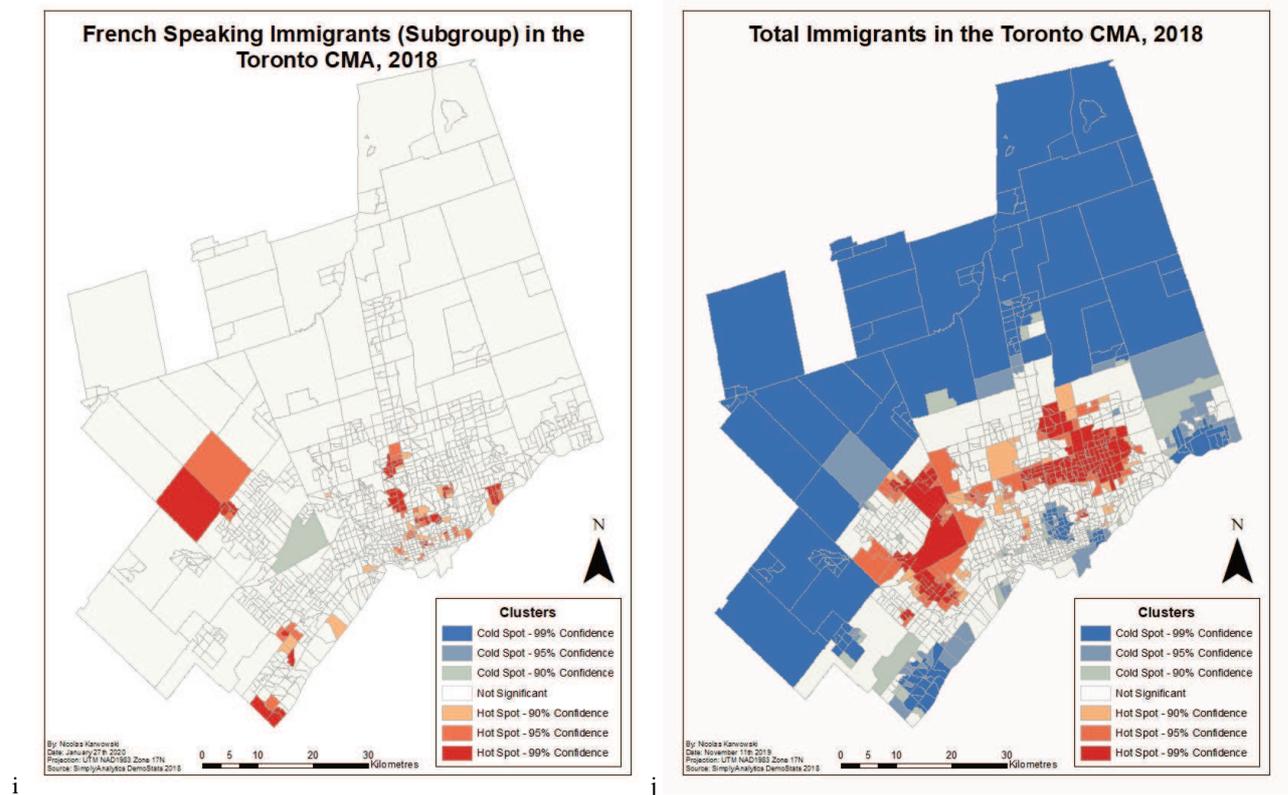


Figure 1. Local clustering of different immigrant and language groups: a) all speakers of French as their mother tongue; b) French immigrants; c) Swiss immigrants; d) Belgian immigrants; e) Algerian immigrants; f) Moroccan immigrants; g) Haitian immigrants; h) Chinese immigrants (control variable); i) combination of French-speaking immigrant groups; j) total immigrants (control variable).

When compared to the Chinese immigrant control variable, the difference in the type of clustering is apparent. The Chinese cluster both in Chinatown within the city of Toronto but also in the suburb of Markham. This cluster is almost entirely significant at the 99% level and is geographically approximately twice as large as the French immigrant cluster, which ranks second in size.

When all the Francophone immigrants were aggregated, clustering did occur, but it consisted of smaller groups of CTs scattered across the CMA. On the other hand, the French mother tongue variable, which adds native-born Canadians and other Francophone immigrants to the previous variable, revealed completely different results (Figure 1a). Three distinct clusters appeared across the CMA, with the most populous one being in the heart of Toronto, whereas the other two are found in Halton Hills and Oakville. A ring-shaped cold spot surrounds the Toronto cluster, stretching from northern Scarborough across Vaughan to Eastern Brampton. Interestingly, while the French mother tongue hot spots do correspond with some of the immigrant group clusters, the cold spot does as well. It may be that the individual groups have a significant presence, but as a communal Francophone group, their presence is no longer significant. The results for the total immigrant group (Figure 1j) show different settlement hot spots as compared to those of Francophone immigrants, indicating that immigration in itself was not the only factor contributing to the aforementioned patterns.

5 CONCLUSION AND OUTLOOK

This study proposes a statistical and visual analysis of the clustering of French-speaking people within the Toronto CMA. Global Moran's I was used for statistical testing of global clustering and Getis-Ord G_i^* visually identified smaller-scale clustering. Ten variables were passed through these two tests. Six of them represented immigrants from Francophone countries on three continents to test whether clustering occurred based on country of origin. One was the aggregation of these six countries to test whether their immigrant status contributed to their clustering. Another was a French mother tongue variable to test whether language was the unifying factor. The last two variables were different immigrant populations, used as control variables to ensure a viable methodology and compare patterns with the Francophone variables. Both tests confirmed clustering at various scales and locations.

The limitations of the study stem primarily from the types of data and methods used but also from the lack of prior research on this topic. Cluster analysis could be done in several ways. While Getis-Ord G_i^* was appropriate to identify local hot spots rather than outliers, outlier analysis using Local Moran's I may result in different findings. Different spatial relationship conceptualizations may also result in different outcomes. The use of the control variables was to ensure that the methodology delivered results consistent with past research on these test groups.

In terms of the input data, the six countries of origin do not fully represent the French-speaking immigrant populations of Toronto. It is also possible that small segments of some groups (Swiss, Belgian) do not speak French but another official language of their place of birth. Additionally, the variables do not account for second- (and later) generation immigrants and their spatial dispersion in the study area. Unfortunately, at the current time, French-speaking immigrant data by country of origin and generation is unavailable. Finally, it must be reiterated that the visual comparisons of clusters can be affected by the size of the spatial units of analysis, here CTs. A future study could compare results across different Census geographies.

While this study did not seek to verify connections between the clustering of the groups and specific explanatory factors, hopefully it lays down the groundwork for follow-up research. We can conclude that clustering does occur at global and local scales. However, this study has shown that the clustering of French-speaking people is not cut and dry, and that further analysis of individual subgroups will be needed to understand the factors and processes that lead to these spatial distributions. Such future results could have implications on the planning of service locations and programs for population groups based on French language and/or regional culture of their birth place.

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