

#61

STAR-MODELS AND URBAN DEVELOPMENT

An ethnographic and historical examination of the connection between urban form and spatial-cultures

JOSHUA FRIESEN

McGill University

joshua.friesen@mail.mcgill.ca

ABSTRACT

In this paper I use Space Syntax methods to compare the relationship between normalized syntactic descriptions of two Quebecois cities (Alma and Saint-Georges) and their respective spatial cultures. In order to do so, I combine into one typology two historical dialectics identified by Hillier and Hanson in their comparative work on cities (1984). The two dimensions of this typology stretch between global-to-local planning and local-to-global planning, and socio-cultural and micro-economic preferences. I then explain how Hillier et al.'s four-pointed star models place a city within this typology (2012). Finally, I use historical and ethnographic methods to see whether qualitative information on the social, economic, and cultural makeup of both places corroborates their syntactic descriptions. The NACH and NAIN analyses suggest that Alma was developed with relatively more global-to-local planning than Saint-Georges and relatively stronger emphasis placed on socio-cultural priorities over micro-economic ones than was Saint-Georges. I found that historical and ethnographic information on Alma and Saint-Georges corroborates this syntactic description.

KEYWORDS

Spatial Cultures, Normalised Angular Analyses, Urban Development, Quebec

1. INTRODUCTION

In this paper, I use Space Syntax methods to compare the relationship between normalized syntactic descriptions of two Quebecois cities (Alma and Saint-Georges), and their respective spatial cultures. In order to do so, I combine in one typology two historical dialectics identified by Hillier and Hanson in their comparative work on cities (1984). I then explain how Hillier et al.'s four-pointed star models can be used to place a city within this typology (2012). Finally, I use historical and ethnographic methods to see whether qualitative information on the social, economic, and cultural makeup of both places corroborates their syntactic descriptions. Alma and Saint-Georges, Quebec share a great deal of provincial and national history and have similar demographic and sociological features, however they have very different histories of urban development (Coté 1994; Vézina 1935). Alma was developed in Quebec's central north – close to Lac-Saint-Jean – in order to house the employees of the hydroelectric, pulp and paper, and aluminum industries active in that area. Saint-Georges, on the other hand, was developed as a defensive outpost on the Chaudière River south of Québec City and near the border with the United States (Bolduc 1969). Because of their different histories of development, I hypothesized that these two settlements would be excellent places to study how spatial configurations contribute to spatial cultures.

2. THEORETICAL CONTEXT

Beginning in 1984, Hillier and Hanson argued that urban spaces were, in specific ways, reflections of underlying social processes (1984). Since then, comparative studies of the spatial properties of cities around the world have identified a dialectic between what can be simplified as generative micro-economic forces and conservative socio-cultural forces in urban development (Hillier and Neto 2002, 182). After comparing the Space Syntax of hundreds of urban grids, this research has postulated that an emphasis (whether in the minds of urban planners or in the minds of individual builders) on micro-economic processes tends to push urban geometry towards the conservation of a few long lines in what has been termed a city's 'structural foreground' and the subsequent proliferation of many shorter lines in a city's 'structural background' (Hillier 1998; Hillier and Neto 2002; Hillier and Vaughan 2007). Micro-economic activity has furthermore been seen to create urban configurations that maximize random contact between urbanites, while cultural preferences have been shown to create urban configurations that conserve patterns of co-presence between different social categories such as men and women, economic classes, and strangers and locals (Hillier 2009). Hillier and others have argued that this spatialized dialectic between commercial expedience and cultural preference produces similarities and differences which are observable in human settlements around the world. As Hillier puts it,

On the one hand, a residential process driven by socio-cultural forces puts its imprint on local space by specifying its geometry and generates a distinctive pattern of local differences, because culture is spatially specific. On the other, a public space process driven by micro-economic activity generates a globalising pattern of space that tends to be everywhere similar because micro-economic activity is a spatial universal. (2002, 162)

The dialectic between expedience (cost-effectiveness and the maximization of contact) and cultural preference (stability and the ordered reproduction of social relations) has further been connected with observable differences between types of city that can be roughly placed on opposite ends of a spectrum from each other. On one end of this theoretical spectrum are cities that are created largely for the function of the reproduction of society in a particular cultural image – administrative capitals (Hillier 1984, 21). On the other end of the spectrum are cities that are created in the service of the exigencies of micro-production – business capitals. As Hillier writes,

This kind of variation [patterned variation between cities globally] suggests a rudimentary typology of settlement forms based on the different balance between the micro-economic and socio-cultural forces. Where the economic process is dominant from the beginning, we find linear or cross-road settlements and these are usually found on major routes between larger towns, a linear town being 'global structure only'. A deformed grid town is one in which both processes run in parallel. A regular orthogonal grid town is one in which the local cultural process is in the spatial image of the global economic process, as in mediaeval planted towns or early American towns, and where the whole grid is essentially a micro-economic rather than socio-cultural creation, as can reasonably be said both of mediaeval planted towns and early American grids. (2002, 175)

Because of the balance between micro-economic and socio-cultural forces in urban development, the degree to which an urban grid is deformed or linearly oriented can be used as a rough measure of the prevalence of one or another priority in a city's history. In this paper I show how normalized measures of integration (NAIN) and choice (NACH) map onto historical differences in the development of Alma and Saint-Georges. I then discuss how different socio-cultural and economic forces are embedded in the material patrimony of both cities. Learning to represent and read this materialization of value is argued to be an important way to understand urban spatial cultures.

Before going further, it should be noted that the distinction between micro-economic processes and other types of economic activity is an important one. As the analysis in this paper will later show, and as Hillier and others have already surmised, economic development is very often wedded to the needs of administrative organs in modern states and in large corporations and industries (Hillier 1998). One should therefore not expect to see the same patterns

of development in any and all urban growth based on some form of production. Indeed, governments, companies, guilds and other such organizations often combine their notions of the 'correct' conservation of social relations with economic production (Bray 2005; Morriset 1998). This pattern is seen in planned cities the world over, and was, in fact, the case in Alma.

Given the differences between micro-economic and other types of economic activity, another dimension needs to be added to Hillier and Hanson's original spectrum, namely the difference between cities that were planned as parts of a regional whole (global-to-local cities) and cities that were planned, or unplanned as the case may be, as centers for local activities of exchange, organization and etc. (local-to-global cities). The following table [Table 1] indicates the resulting taxonomy of settlements.

	Local-to-global planning	Global-to-local planning
Socio-cultural priorities	<ul style="list-style-type: none"> Dense patterns in the city's background network reflecting culturally specific preferences for the mixing or segregation of social categories. Foreground network deformed by the exigencies of the background network's development. Background network clustered around a well-integrated foreground network. 	<ul style="list-style-type: none"> Both foreground and background networks defined by the city's administrative or cultural centers and the space surrounding them. Foreground network serves a representational function.
Micro-economic priorities	<ul style="list-style-type: none"> Both foreground and background networks maximize random contact. 	<ul style="list-style-type: none"> Highly structured grid, tending in most cases towards orthogonal order. Little deformation of background or foreground networks.

Table 1 - Taxonomy of settlements

As one can see from [Table 1], in global-to-local cities the foreground network tends to play a larger role in the organization of the city whereas in local-to-global cities the opposite occurs. In this typology, the differences in economic and socio-cultural cities stay the same. Economic cities tend to have a less deformed grid, which facilitates the efficient movement of goods and services, whereas socio-cultural cities have a more deformed grid that facilitates the conservation of social relations and the reproduction of cultural activities.

3. METHODS

Using the normalized variables of angular choice (NACH) and integration (NAIN) Hillier et al. introduced 'star model' representations of global urban form (2012). Star models graphically represent the maximum and mean values of both NACH and NAIN at a radius of 'n' in order to allow for a visual comparison of different urban systems along those dimensions. These normalized values produce numbers that are not relative to the size of their systems and therefore comparable across systems. In their paper, Hillier et al. argue that,

mean and max NAIN show the ease of accessibility in the foreground (max) and background (mean) networks in the usual syntactic sense, while mean and max NACH index the degree of structure in the system: the mean NACH the degree to which the background network forms a continuous grid with direct connections, rather than being broken up into discontinuous sub-areas; while max NACH represents the degree to which the foreground grid structures the system by deformations and interruptions of the grid. (2012, 170)

Converting road-centreline data to spatial segments in the DepthMapX software allows researchers to quickly compare large urban systems on the basis of their NACH and NAIN. After making this conversion, I analyzed Alma and Saint-Georges' segment maps using a 1024 bin

Tulip angular analysis with a topological radius of 'n'. In what remains of this section, I explain what maximum and mean NACH and NAIN values represent before presenting the actual results of the tulip analysis of Alma and Saint-Georges in the next section.

As Hillier et al. explain above, the maximum values of each system represent the foreground network because they index the street segments that have the highest angular choice or angular integration measures. Maximum NAIN values index the accessibility of the foreground network in an urban grid. Accessibility refers to the topological distance of each street segment from every other street segment in the system, in light of the angular differences between the connectivity of each segment. A high maximum NAIN value means that the foreground network – the system of main roads – of a city is easily reachable from all of parts of the city. In other words, high maximum NAIN values mean that the foreground network is accessible. A high mean NAIN value means that the background network of a city – its residential area – is easily reachable from all other parts of the city. Maximum NAIN indexes the foreground network of a city because the most highly integrated street segments are typically a city's main streets. Mean NAIN values index the accessibility of residential areas because the vast majority of a city's street segments are typically located in its background network. Because of this, background accessibility has a much greater impact on the system's mean values than does foreground accessibility.

NACH values follow a similar logic. High maximum NACH values indicate high choice values in the 'choicest' segments through the city – that is its main streets and byways. Angular normalised choice is calculated "by counting the number of times each street segment falls on the shortest path between all pairs of segments within a selected distance (termed 'radius'). The 'shortest path' refers to the path of least angular deviation (namely, the straightest route) through the system" (Hillier and Iida 2005, 475).

Because NACH values represent the straightness of urban routes, high maximum NACH values indicate that a city's main streets are prioritized relative to its other streets. The city's residential neighbourhoods are bent and broken in order to create straighter main streets. Conversely, high mean NACH values show that a city's background network is relatively straight (its parts are not deformed by the foreground network or by its own design).

How can we relate four-pointed star models to the typology of micro-economic, socio-cultural, global-to-local, and local-to-global cities I presented in [Table 1]? We can do so by taking mean NAIN values as an index for the relative degree of socio-cultural deformation of a city's background and foreground networks and by using structural scores (or NACH values) to see at what level each city is structured and therefore at what level decisions about urban geometry appear to have been made.

High maximum NAIN values indicate that a city's foreground network is easily accessible from all other parts of the city. This suggests that a city's main thoroughfares have played a prominent role in the development of the city. Hillier et al. found that maximum and mean NAIN values tend to co-vary (2012). Cities with high maximum NAIN values tended to have high mean values and vice versa. Taken together, high NAIN values suggest that a city has been developed with an emphasis on micro-economic priorities rather than on socio-cultural preferences. Ease of accessibility facilitates trade, movement, and random contact between different types of people. It also minimizes the ability of space to segregate urbanites into socio-cultural categories.

High maximum NACH values point to a great deal of linear structure in a city's main arteries. Hillier et al. found that maximum and mean NACH do not always co-vary (2012). Sometimes a city could have very high maximum NACH values but relatively average mean NACH scores. What this suggests is that when a NACH maximum is high in a city but its mean NACH is relatively low, global-to-local structuration has created a top-down order with the help of the city's main streets. Global planning creates, in other words, arteries around which residential neighbourhoods form. When maximum NACH scores are relatively low compared with mean NACH scores, the background network's structure is clearly dominant over the foreground network's structure.

Overall, Hillier et al. suggest that these features of a city’s configuration can be simplified by dividing the mean NACH into the maximum NACH and by comparing this with the relative strength of the mean NAIN (2012, 187). Once this is done, the resulting values place a city somewhere on the typology presented in [Table 1] and reproduced with a few modifications in [Table 2].

	Local-to-global planning (Low NACH score)	Global-to-local planning (High NACH score)
Socio-cultural priorities (Low mean NAIN)	<ul style="list-style-type: none"> Dense patterns in the city's background network reflecting culturally specific preferences for the mixing or segregation of social categories. Foreground network deformed by the exigencies of the background network's development. 	<ul style="list-style-type: none"> Both foreground and background networks defined by the city's administrative or cultural centres and the space surrounding them. Foreground network serves a representational function.
Micro-economic priorities (High mean NAIN)	<ul style="list-style-type: none"> Background network clustered around a well-integrated foreground network. Both foreground and background networks maximize random contact. 	<ul style="list-style-type: none"> Highly structured grid, tending in most cases towards orthogonal order. Little deformation of background or foreground networks.

Table 2

Besides analyzing Alma and Saint-Georges based on their syntactic features I also compared the histories of their urban development and engaged in six months of ethnographic research in each city. I lived in both places, made friends there, volunteered, attended public events, attended city-council meetings, and interviewed people from both cities who represented their respective communities as politicians, heads of large local administrative organs, or as business people.

4. RESULTS



Figure 1 - Segment Map of Alma showing NACH at radius 'n'



Figure 2 - Segment map of Saint-Georges showing NACH at radius 'n'

	NACH	NAIN
MAXIMUM values	Alma: 1.56 SG: 1.57	Alma: 1.30 SG: 1.33
MEAN values	Alma: 0.87 SG: 1.00	Alma: 0.78 SG: 0.82

Table 3 - NACH and NAIN values comparison between Alma and Saint-Georges (SG)

As one can see from [Table 3], Alma and Saint-Georges had nearly identical maximum NACH values, but Alma’s mean NACH value was lower than Saint-Georges’. This indicates that Saint-Georges’ background network – its residential area – is less deformed by sociocultural priorities or by its foreground network than Alma’s is.

Alma’s maximum NAIN value is slightly lower than Saint-Georges’ maximum NAIN value. This indicates that Alma’s foreground network is relatively harder to access than Saint-Georges’ foreground network. Alma’s mean NAIN value is likewise lower, as one would expect, than Saint-Georges’. This means that Alma’s background network is overall harder to access than Saint-Georges’. The NACH score for Alma and Saint-Georges compared with each city’s respective mean NAIN value is shown in [Table 4].

	Alma	Saint-Georges
NAIN mean	0.78	0.82
NACH score	1.79	1.57

Table 4

Given the mean and maximum NACH and NAIN values for Alma and Saint-Georges it is possible to locate both cities on the typology shown in [Table 5].

	Local-to-global planning (Low NACH score)	Global-to-local planning (High NACH score)
Socio-cultural priorities (Low mean NAIN)		Alma
Micro-economic priorities (High mean NAIN)	Saint-Georges	

Table 5

Because Alma has a lower maximum NAIN value, a much higher mean NAIN value, an equal maximum NACH value, and a much lower mean NACH value than Saint-Georges, we can say that Alma is expected to be a city planned more on a global-to-local level with socio-cultural priorities emphasized in its construction rather than micro-economic ones. In Saint-Georges we can say that since the city has a higher mean NAIN value than Alma and a lower NACH score, it is closer to being planned from a local-to-global level and with micro-economic rather than socio-cultural priorities.

Since it is possible to produce a numerical basis for the qualitative typology presented in [Table 1], is there a way to corroborate that a city was, in fact, largely developed by local-to-global rather than global-to-local planning, and with micro-economic rather than socio-cultural priorities? If it is theoretically possible to measure the position of a city in relation to two different syntactic dimensions, is it also possible to confirm by methods other than the syntactic what the syntax of a city suggests about its material patrimony?

One way to try and answer this question is to study the historical development of both cities and to engage in an ethnographic examination of how people live together in each. Presumably, cities that are based on more global-to-local order will have a clearer statement of ideological planning than cities based on the local and uncoordinated prerogatives of individual builders. The very existence of a municipal 'master-plan' is evidence, depending on the longevity and comprehensiveness of its mandate, of global-to-local planning. An absence of such a plan or clear directives for municipal development is evidence for more local-to-global planning.

5. HISTORICAL CONTEXT

Alma has a population of 26, 016 people in its urban area. Historically, Alma is the result of the Quebec government's amalgamation of four smaller municipalities in 1962 (Meynaud and Léveillé, 1972). Isle-Maligne, Naudville, Riverbend, and St. Joseph d'Alma were independently founded in 1924, 1943, 1925, and 1917 respectively (Tremblay 1967). Isle-Maligne and Riverbend were both built by companies to house their workers (Côté 1994). The Price Brothers Company built Riverbend in 1924, whereas the Aluminum Company of America (Alcoa) and the Duke-Price Company began construction of Isle-Maligne in 1924, starting with the 'quartier de bosses' (Côté 1968). Naudville was incorporated in 1943 because the towns of St. Joseph d'Alma and Riverbend refused to pay for sanitation, education, or other infrastructure for the new community, which had been built by property owners from St. Joseph d'Alma (ibid). Naudville was intended to be a dormitory community for the factories in Riverbend and Isle-Maligne. As such, the nascent village had little commerce or industry of its own and consequently found itself in a great deal of debt after trying to pay for its roads, sewers, and schools. Naudville's debt load was the central motivation for the amalgamation in 1962 of the four towns comprising modern Alma (Meynaud and Léveillé, 1972).

Riverbend's layout was based off a master plan influenced by the garden city movement in the United Kingdom (Côté 1994). Its curving streets centered on a communal park and community hall, and its Tudor and American Vernacular style homes were clearly organized by socio-economic status and ethnicity (ibid). The highest ranking managers of the Price Brother's Company paper factory were located in the most structurally segregated streets of Riverbend on its northwest side, whereas the homes of the lower level managers and machine foremen were located on more integrated roads closer to the railway tracks around the town's east and south sides (ibid). The managers living in Riverbend were of Anglophone (British, American or English Canadian) extraction while the labourers housed in Saint-Joseph d'Alma and Naudville were of French-Canadian and Francophone origin. This socio-cultural segregation was also materialized in the work camps of the Quebec Development Company for the hydroelectric dam project on Isle-Maligne and the subsequent town of Isle-Maligne (Côté 1968). In both places, workers were purposely segregated according to their ethnicity. Separate roads or subdivisions were also built for the company's bosses and managers apart from the company's manual labourers in order to further segregate the labour force based on economic class (ibid).

St. Joseph d'Alma, unlike the other three parts of Alma, was originally built around the Roman Catholic Church's administrative facilities next to the Petite-Décharge River (Tremblay 1967). This village's urban structure centered on the Church and the Seminary behind it, a deformed urban grid radiated out from the main road that ended at a right angle to the face of the Eglise St. Joseph. The grid of St. Joseph d'Alma was renovated in the 1960s after Alma amalgamated. St. Joseph d'Alma became, for all intents and purposes, the 'downtown' of the new city of Alma and was the primary center for local commerce even before the amalgamation (Lussier 1980).

In sum, Alma is a city that was mainly created to house the workers of large companies. Ethnic and class segregation was built into the city along with the preference for idyllic country living expressed in the geometry, landscape architecture, and domestic architecture of the garden city movement. St. Joseph d'Alma was the only part of the city built as a commercial hub for local farmers. Like most other such settlements in Quebec, it was centered on the administrative and religious facilities of the Roman Catholic Church. Though Alma was undoubtedly the product of industry, and therefore of productive processes, it was created from scratch to embody the socio-cultural preference for ethnic and class division. The parts of Alma, such as Naudville and St. Joseph d'Alma, which were not planned by corporations, were structured on a variation of the orthogonal grid. In Naudville's case, the urban layout was in the shape of the simplest variation of an orthogonal grid, and in St. Joseph d'Alma's case it was in the shape of a grid that was slightly deformed by the dominant presence of the Church and its seminary.

Saint-Georges is a city with 31,173 residents at the time of the last available census data. Its contemporary extent was created by the amalgamation of Saint-Georges Ouest, Saint-Georges Est, Aubert-Gallion, and Saint-Jean-de-la-Lande in 2002 (Lussier 2005). The municipality of Saint-Georges-Est was formed in 1907 but was not incorporated until 1948 (Bolduc 1982), the municipality of Aubert-Gallion was erected in 1856, the municipality of Saint-Jean-de-la-Lande in 1933, and the municipality of Saint-Georges-Ouest in 1947. All of these settlements grew out of the seigniorial land tenure system that was in place in French Canada from 1627 until it was abolished by British royal decree in 1854 (Lamonde 2013). Born from the French nobility's experience distributing and organizing land in Normandy, the seigniorial system in Quebec centered around the distribution of seigneuries to prominent colonialists who were then expected to manage the division of their land into lots – usually oriented towards a river – as well as the settlement of these lots by censitaires (also known as habitants) and the development of a mill for grinding grain, a seigneurial house for collecting rents from the *habitants*, and potentially a courthouse or commune for the area's residents (ibid).

Most of the early urban development of Saint-Georges was fundamentally determined by the seigniorial system (Bolduc 1969). The majority of Saint-Georges' roads follow the plot lines (or *rangs*) of the agricultural strips that extend back from the Chaudière River. Towns in the Chaudière valley were gradually built up around a seigneurial mansion and its corresponding church, mill, and courthouse.

In sum, Saint-Georges' early development was oriented by its river and by the social hierarchy built into the seigneurial division of land along with the cultural organization of space provided by the Catholic parishes (Ferron and Cliche 1974). There was no specific segregation based on ethnicity or language in Saint-Georges even though the fourth seigneur of Aubert-Gallion, one William Pozer, brought to Quebec nearly two hundred colonists from his native Germany who were originally protestant and German speaking (Garant 1946). Nor was there any particular segregation based on occupation (Ferron and Cliché 1974), although there is some evidence that wealthier *habitants* tended to live closer to the center of the settlement which gave them quicker access to the amenities provided by the seigneur (Lamonde 2013). More formalized systems of urban development were not introduced to Saint-Georges until 1951 when the first zoning laws were enacted and the roads in Saint-Georges were systematically changed from their original toponomy, which tended to recognize the seigneurial and clerical elite, to numbered streets and avenues, which were considered more modern (Bolduc 1982). Since the beginning of Saint-Georges' development the municipality has been based, it seems, on expedience. No special values have been built into its efficiently elongated grid pattern.

6. ETHNOGRAPHIC CONTEXT

Speaking with people in Alma about their city I noticed five salient themes. First, everyone I spoke to underscored that Alma was a city dominated by '*les grandes industries*'. Second, people emphasized that Alma was a place with few class differences, a place where, as one resident explained, the upper classes were only slightly 'above' the lower (this resident was herself an architect and lived in Riverbend). Thirdly, the issue of community integration was often spoken about. My interlocutors told me that Alma was meant to be an inclusive community. This perception of Alma's collective priorities seemed to be supported by the city's municipal council, which made Alma's motto, "*Ville de l'hospitalité*". A great deal of the city's public art, including a large sculpture of a blooming flower in front of its central library, was also dedicated to the theme of integration. Fourthly, the people I spoke to were worried about the future of their city. While I was there (August 2015 to February 2016) machine number nine in the paper factory closed, resulting in the layoff of forty-five people (Tremblay 2015). Three years previous to that, a protracted labour dispute between Rio Tinto Alcan and its employees cost the city millions of dollars in economic activity (Gauthier 2012). Overall, people seemed unsure about what large transnational interests would do with the factories that had supported Alma in the past. Finally, people in Alma were very interested in the natural environment surrounding their city. Many people hunted or fished (there was a large festival in autumn dedicated to celebrating 'la chasse'), and many others skied, snowmobiled, hiked, ran or biked on the extensive provincial bike-network built into and around Alma. In the summer, Almatois could often be seen picking wild blue berries by the side of the road, and in the winter ice-fishing villages blossomed on the frozen river across from the home I rented. What had been bike paths in summer were made into snowmobile paths in winter, and a series of public parks scattered throughout the city were always busy with hikers, joggers, skiers or people snowshoeing.

People in Saint-Georges were also quite active, although hunting and snowmobiling seemed more popular there than were skiing or biking. When I spoke to Saint-Georgians about their city I noticed three salient themes. First, Saint-Georges was presented as a business friendly place. I was often told that people living in the 'Beauce' (the broader region surrounding Saint-Georges) like to own their own businesses and to be their own bosses. Indeed, this was a theme that was commonly observed in the city's newspapers and institutions as well. There is a museum and a special school for entrepreneurship in Saint-Georges and the city's self-made business acumen was widely praised and theorized in Quebec's provincial newspapers as well as in scholarly materials about the area (Palard 2009). Second, people living in Saint-Georges did not seem, as far as I could tell, to invest their identity in the landscape as much as people in Alma did. People told me that if you were born in the Beauce you were always Beauceron(nes), but that seemed to refer mainly to an attitude rather than any specific attachment to the land. If this attitude could be distilled – as it was by one friend of mine – it might be said to be a fierce desire to be independent. Independence was the third salient theme I noted. A Beauceron friend explained to me that he did not want to be a 'functionary' in a government office. He told me that the point of life was to work, but more particularly, to work for oneself. In sum, working for the government or being otherwise supported by the state was seen to be a very undesirable outcome.

7. DISCUSSION

What does the ethnographic and historical record allow us to add to the syntactic descriptions of Alma and Saint-George? A comparison of the two city's NACH and NAIN values suggests that Alma should be a settlement wherein socio-cultural priorities have been foregrounded more so than in Saint-Georges, and where global-to-local planning has been more predominant than in Saint-Georges. The historic record of both cities appears to support these syntactic conclusions. Global-to-local actors including the Quebec Development Company, the Price Brothers Company, and the Aluminum Company of America planned large parts of Alma. This was not the case in Saint-Georges. Whereas Alma was developed largely by neighbourhood section (or by whole town), Saint-Georges was developed largely by the gradual extension of streets. The historical record also suggests that socio-cultural priorities, namely the spatial deployment of a

hierarchy of classes, and the segregation of ethnicities, were present to a much greater degree in the planning and design of Alma and its constituent communities than they were in Saint-Georges.

Without having the space to go into my ethnographic work in great detail, the broad summary I provided of the salient themes I noted in my discussions with people living in both cities seems to support the syntactic description of Alma and Saint-Georges provided by NACH and NAIN measurements. People living in Alma felt that their city was much more connected to global forces – in the shape of the international industries that had founded their city. People in Alma seemed to be likewise more interested in questions of socio-cultural identity. One index of this interest in identity is the fact that people in Alma voted for the Parti-Québécois, a nationalist party, in every provincial election since the party's development in the late 60s and early 70s. People in Alma also voted in favour of both referenda on whether Quebec should separate from Canada (the first in 1980 and the second in 1995). The Saint-Georgians I spoke with were, on the other hand, suspicious of global planning and preferred localized industry (another word for micro-economic activity perhaps). It was generally easier to speak English in Saint-Georges as well (more people knew English and it seemed more 'acceptable' to do so), and concern over one's socio-cultural identity seemed to be less pronounced than it had been in Alma. Voters in Saint-Georges have also never elected a candidate from the Parti-Québécois, preferring instead to elect federalist and pro-business Liberal candidates or, for a brief period, members of the *Action Démocratique du Québec*, a right-leaning 'populist' party that defined itself as being autonomist as far as Quebec's relation to Canada was concerned (ADQ website 2011; Farney and Rayside 2013). Saint-Georgians also voted against both referenda on whether Quebec should separate from Canada.

8. CONCLUSION

In this paper I compared the spatial cultures of Alma and Saint-Georges by using their NACH and NAIN scores to place them within a typology that stretched between global-to-local planning and local-to-global planning and between socio-cultural and micro-economic priorities. Based on their syntactic properties I found that Alma was expected to be a city planned closer to the global-to-local level and with relatively greater emphasis given to socio-cultural priorities.

I then compared these syntactic findings with a brief historical and ethnographic examination of both places. I found that the historical record of urban development in Alma and Saint-Georges supports the syntactic description of both places. Many of Alma's parts were planned by large corporations from the top down and were explicitly intended to embody a preferred arrangement of social classes and ethnicities. Saint-Georges, by contrast, was not settled through state or corporate intervention but largely developed through the local priorities of the area's seigniors and residents. Ethnographic investigation further supported the syntactic description of both cities. I found that people in Alma were well aware of the global influence on the development of their town and I also found that questions of socio-cultural identity and integration were of continuing concern. In Saint-Georges, most residents emphasized local business and entrepreneurship along with the desire for political autonomy.

REFERENCES

- Anon, 2011. *Autonomy and identity*. Available at: <https://web.archive.org/web/20110518140741/http://www.adq.qc.ca:80/en/issues/autonomy-identity/> [Accessed January 30, 2017].
- Bolduc, R., *Essor d'une ville : ville de St-Georges, 1907-1982 : 75e anniversaire*.
- Bolduc, R., 1969. *Saint-Georges d'hier et d'aujourd'hui*, Beauce Publications.
- Bray, D., 2005. *Social Space and Governance in Urban China: The Danwei System from Origins to Reform*, Stanford University Press.
- Côté, dany, 1968. *Isle-maligne societe d'histoire du lac saint-jean*, ed., New York.
- Côté, D. et al., 1994. *Riverbend: splendeur et déclin d'une ville de compagnie*, Société d'histoire du Lac-Saint-Jean.
- Farney, J. & Rayside, D., 2013. *Conservatism in Canada*, University of Toronto Press.
- Ferron, M. & Cliche, R., 1974. *Les Beaucerons, ces insoumis: petite histoire de la Beauce, 1735-1867*, Montréal: Hurtubise.
- Garant, A., 1988. *Le Soleil se lève à l'ouest : Ville de Saint-Georges-Ouest, 1948-1988* [André Garant],
- Gauthier, M., Lock-out à l'aluminerie Rio Tinto Alcan d'Alma. *La Presse*. Available at: <http://www.lapresse.ca/le-quotidien/actualites/201201/01/01-4482123-lock-out-a-laluminerie-rio-tinto-alcan-dalma.php> [Accessed January 31, 2017].
- Hillier, B. 1998. *Space Is the Machine: A Configurational Theory of Architecture*, Cambridge University Press.
- . 2002. A theory of the city as object: or, how spatial laws mediate the social construction of urban space. *Urban Design International*, 7(3/4), p.153.
- . 2009. What do we need to add to a social network to get a society? answer: something like what we have to add to a spatial network to get a city. *Proceedings of the 7th International Space Syntax Symposium*.
- Hillier, B. & Hanson, J., 1984. *The Social Logic of Space Reprint edition.*, Cambridge u.a.: Cambridge University Press.
- Hillier, B. & Iida, S., 2005. Network and Psychological Effects in Urban Movement. In *Spatial Information Theory*. International Conference on Spatial Information Theory. Springer, Berlin, Heidelberg, pp. 475–490.
- Hillier, B. & Netto, V., 2002. Society seen through the prism of space: outline of a theory of society and space. *Urban Design International*, 7(3/4), p.181.
- Hillier, B. & Vaughan, L., 2007. The City as One Thing. *Progress in Planning*, 67(3), pp.205–294.
- Hillier, W.R.G., Yang, T. & Turner, A., 2012. Normalising least angle choice in Depthmap - and how it opens up new perspectives on the global and local analysis of city space. *Journal of Space Syntax*, 3(2), pp.155–193.
- Lamonde, Y., 2013. *The Social History of Ideas in Quebec, 1760-1896*, Montreal: Mcgill Queens Univ Pr.
- Lussier, D., 1980. *Processus de rénovation d'un centre-ville: Alma au Lac St-Jean*.
- Lussier, I., 2005. *Dionne Spinning Mills Co.: histoire d'une famille industrielle de Saint-Georges de Beauce*, Québec: Éditions GID.
- Meynaud, J. & Léveillé, J., 1972. *Quelques expériences de fusion municipale au Québec*, [Montréal]: Editions Nouvelle frontière.
- Morisset, L.K., 1998. *Arvida, cité industrielle: une épopée urbaine en Amérique*, Sillery, Québec: Septentrion.
- Palard, J., 2009. *La Beauce Inc.; Capital Social et Capitalisme Régional*, Les Presses de l'Université de Montréal.
- Tremblay, S., Papetière d'Alma : Fermeture de la machine #9 le 1er septembre. *Journal le Lac St-Jean*. Available at:<http://www.lacstjean.com/Actualites/Economie/2015-08-14/article-4246484/Papetiere-d%26rsquo%3BAлма-%3A-Fermeture-de-la-machine-%239-le-1er-septembre/1> [Accessed August 16, 2015].
- Tremblay, V., 1967. *Alma au Lac Saint-Jean; son histoire*. [Chicoutimi: Société historique de Saguenay.
- Vézina, R., 1935. *Histoire de Saint-Georges de Beauce*.