

---

## The creative class thesis and the mobility patterns of knowledge workers considering the place of birth: the case of Montreal

---

Diane-Gabrielle Tremblay\*

100, rue Sherbrooke Ouest,  
Téluq-UQAM, Montreal, (Qc) H2X 3P2, Canada  
Fax: 1-(514)-843-2160  
E-mail: [dgtrembl@teluq.uqam.ca](mailto:dgtrembl@teluq.uqam.ca)  
\*Corresponding author

Sébastien Darchen

Faculty of Environmental Studies,  
York University,  
4700 Keele Street,  
Toronto, (ON) M3J1P3, Canada  
Fax: 1-(416)-736-5679  
E-mail: [sdarchen@yorku.ca](mailto:sdarchen@yorku.ca)

**Abstract:** The creative class thesis of economic development has had a major impact on the understanding of knowledge and creative workers and on the analysis of the mobility of human capital. Using quantitative and qualitative material, our paper examines the influence of quality of place and career opportunities on the mobility of students in science and technology fields as a proxy for the professional category of ‘the knowledge workers’. Our results show that the criteria linked to quality of place has a greater impact on the attraction and retention of students from abroad than for the domestic-born groups. These results could partly confirm some of the assumptions of the creative class about the attraction of knowledge workers. However, we remain sceptical about urban policies that create incentives-based solely on this thesis of economic development to attract talents or knowledge workers.

**Keywords:** attraction/retention; knowledge worker; creative class; CC; quality of place; economic development.

**Reference** to this paper should be made as follows: Tremblay, D-G. and Darchen, S. (2010) ‘The creative class thesis and the mobility patterns of knowledge workers considering the place of birth: the case of Montreal’, *Int. J. Knowledge-Based Development*, Vol. 1, No. 3, pp.176–203.

**Biographical notes:** Diane-Gabrielle Tremblay is a Canada Research Chair on the Socio-organisational Challenges of the Knowledge Economy (<http://www.teluq.uqam.ca/chaireecosavoir>) and the Director of the CURA Research on Work-Life Balance over the life course (<http://www.teluq.uqam.ca/aruc-gats>).

Sébastien Darchen holds a PhD in Urban studies (INRS-UCS). He is currently an Assistant Professor at York University in the Faculty of Environmental Studies, Planning Program (Toronto). He has been also a Postdoctoral Fellow at the Canada Research Chair on the Socio-organisational Challenges of the Knowledge Economy (Montreal).

---

## **1 Introduction**

In recent years, the creative class (CC) thesis put forward on the international scene by the work of Florida (2002, 2003, 2005) has had a major influence on the analysis of the competitiveness of various metropolitan areas and of their capacity to attract and retain so-called knowledge and creative workers. The thesis argues that quality of place is a major factor impacting on the attraction of *talents*. In a context of increased economic competitiveness between cities, it is useful to evaluate if the criteria related to quality of place actually does have an influence on the attraction and retention of *talents* (the term *talents* is often used to refer to the so called knowledge and creative workers). We also believe that because this thesis has become so popular amongst elected officials and decision-makers, and has had a strong influence on the built environment and on planning, it is important to question its impact on the attraction of knowledge workers and thus on economic development. While popular, many economic theorists have questioned the relevance of distinguishing between the CC and human capital models (Glaeser, 2005). In our view, these questions are justified, but the CC thesis has put forward some criteria related to quality of place that may have been neglected in previous research and it remains to be seen to what extent these criteria are indeed pertinent. Our research addresses one particular aspect of this issue, science and technology workers, and can not therefore conclude on the validity of the entire CC thesis per se. However, our research contributes to a better understanding of the importance of the various criteria related to the quality of place on the mobility of knowledge workers in the case of Montreal. In particular, we highlight the effects of place of birth on the attraction and retention of students in science and technology disciplines who are soon to become 'knowledge workers', and who are seeking employment in these fields. According to the CC thesis, their locational choices should have an important impact on local and regional development (Beckstead and Brown, 2006). Of course, there may be some self-selection issues in the answers we collected. Also, the use of students in science and technology is not a perfect substitute for science and technology workers, but it does give an indication of the elements which appear to be useful in attracting and retaining these future science and technology workers. Indeed, given the fact that there are no collective organisations such as unions that could be used to reach a broad category of knowledge workers, the answers given by students in science and technology disciplines give a reasonable indication of the factors of attraction within these groups. Keeping this in mind, and since little or no empirical research has been done to test the criteria that can attract and retain junior knowledge workers (students), our results will give a good first indication for future research to build on.

In our paper, we compare the results of an online questionnaire to which students registered in science and technology programs at universities and schools of engineering in Montreal responded. We conducted a quantitative analysis of the results using two

types of statistical tests with the software SPSS 16. We used the Mann-Whitney tests to compare the results between various groups. As we explain in the methodology, parametric tests are usually more powerful than non-parametric tests but some conditions need to be filled in order to use them. We therefore explain in the methodology why we used Wilcoxon and Mann-Whitney tests (non-parametric tests) to analyse our results. In fact in this paper, we compare three groups according to their origin (place of birth). We thus elaborate further upon the results of research already presented elsewhere on the case of Montreal (Darchen and Tremblay, 2010a). We have also already provided some insights into the fact that knowledge workers are not necessarily seeking a vibrant ‘big-city’ environment as a place to live. In a preceding paper, we showed that Ottawa performed better than Montreal in regards to the quality of life as a factor of attraction and retention for knowledge workers (Darchen and Tremblay, 2010b). In this paper, our aim is really to distinguish the results according to the students’ place of birth to see if there are differences between foreign-born students and those from Montréal and from the rest of the province of Québec. This is important when considering the attraction-retention policies which cities, provinces and states wish to put forward in order to attract and retain knowledge workers.

We used the CC thesis to determine which criteria related to place attraction could be important in an urban setting (openness to creativity, lifestyle, and level of tolerance) and to compare these with criteria related to career opportunities (quality of work and level of salary). Our research thus addresses the relative importance of these factors in the choices students make regarding the place they want to live and work in. There is also a qualitative dimension to our research since we conducted some interviews with students in science and technology disciplines in Montreal between September 2007 and January 2008. This material is interwoven with the presentation of the quantitative results in a complementary fashion.

Our paper starts with a short overview of the literature and the objectives of the paper. We present the research design and methodology of our research, and compare the results of the statistical tests with the quotes from interviews to illustrate the quantitative content. We then proceed to a discussion of the results and to our conclusion.

## **2 The theory of the CC and the attraction of talents: the role of the criteria related amenities and to the quality of place**

Florida (2002, 2003, 2005) has been influential in highlighting the positive impact of urban amenities and criteria related to quality of place on the attraction of *talents*. According to Manning and Darnton (2006), Florida’s approach is part of the third model of metropolitan economic development, the two other models being the social capital and the human capital models. According to these authors, Florida’s model is based on the human capital model but places an important emphasis on the role of urban amenities. Clark (2004a, 2004b) supports the notion that the quality of place is a necessary condition to attract talented people, while Thomas and Darnton (2006) appropriately remind us that the work of Jacobs (1961, 1969, 1984) had already shown the link between the attractiveness of a neighbourhood and the attraction of talented people.

Indeed, Jacobs (1984) was the first to speak of creative cities in her book *Cities and Wealth of Nations*. Here, she spoke of particularly diversified and innovative cities, where exchange of ideas and improvisation led to creativity and strong urban vitality. In

her view, the diversity of a population led to creativity and innovation. In the 1990s, Jacob's research contributed to by improving amenities and emphasising the diversity of populations, which led to new types of governance policies for the revitalisation of urban centres.

In his book *Cities and Ethic: an Essay for Jane Jacobs*, Glaeser (1997), an urban economist, indicates that cities that function well need cultural and industrial diversity to function well [Glaeser, (1997), p.15], thus supporting Jacob's views. Glaeser indicates that the concentration of population is the vector of innovation and productivity for a city. He speaks of *urban anonymity* [Glaeser, (1997), p.4] and indicates that some people feel more free when there are more people around them, which would not be the case in smaller cities.

We should mention that there is some debate in the field of urban economics regarding the sources of knowledge spillovers. On one hand, Arrow (1962) and Romer (1986) developed a concept which was formalised by Glaeser (1992) and known as the Marshall-Arrow-Romer (MAR) model. According to this model it is the concentration of the same type of industry within a region that facilitates innovation (Beaudry and Schiffauerova, 2009; Feldman and Audretsch, 1999). To the contrary, Jacobs (1969) emphasised that the sources of innovation are external to the industry. She claimed that the variety of industries within a geographic region fosters knowledge spillovers (Beaudry and Schiffauerova, 2009). According to Jacobs, cities are the sources of innovation; the diversity of knowledge sources is greatest in cities (Feldman and Audretsch, 1999). Different indicators are used to measure Jacobs' externalities but they generally concern two main areas: *diversity* (which covers different measures of industrial diversity and specialisation), and the *market size* (which represents the scale of urbanisation economies and can be measured by various employment or population indicators) (Beaudry and Schiffauerova, 2009). In this debate on the sources of knowledge spillovers, we note a third type of externality which refers to Porter's (1990) work: competition is better for growth. Jacobs also discusses the effect of competition on knowledge spillovers and growth but to a lesser degree (Beaudry and Schiffauerova, 2009). If we come back to the CC thesis of economic development, we can take note that Florida (2005) also praises diversity and the urban environment as sources of innovation but he is not concerned with their effects on industry but rather on the mobility and distribution of a certain type of workers (the professionals from the CC).

If we go back further, Adam Smith and Alfred Marshall have highlighted the role of idea generation that takes place in urban economies (Glaeser, 2005). The CC thesis thus builds upon ideas put forward previously, but is arguably more assertive in regards to the importance of urban amenities and quality of place criteria. There is certainly no consensus concerning the relationship of quality of place criteria (level of tolerance, openness to creativity, lifestyle, etc.) in the attraction of human capital in the field of urban economics. It also remains to be seen to what extent these criteria actually do play a role in knowledge workers' decisions relative to their chosen location for work and living.

A recent paper on the distribution of the professionals from the CC in Europe, enlightens the fact that a regional climate of tolerance and openness has a positive effect on the regional share of the CC, this research also shows that the distribution of professionals of the CC is highly uneven across Europe (Boschma and Fritsch, 2007). The regional climate of tolerance and openness is measured using Florida's indicators:

the share of Bohemian occupations<sup>1</sup> in the total workforce and the share of foreign born people for each region. This research therefore confirms that there is a correlation between a better 'people climate' and a higher concentration of professionals of the CC. However, this research does not prove that a concentration of creative people necessarily contributes to regional growth or has an additional effect on regional growth. This statement still requires to be verified empirically.

In regards to the link between the quality of place (as defined with Florida's criteria) and economic development at the regional level, it is important to recognise that there is not yet a clear consensus. Beckstead and Brown (2006) indicate, e.g., that a combination of human capital (e.g., knowledge workers associated with professionals working in the cultural sector) remains a better indicator to predict urban growth than urban amenities. They demonstrate that there is a link between the size of the city and the portion of people employed in science and technology fields as well as for its prospect of growing over time. They concluded that larger cities have a larger number of firms which require more specialised types of human capital such as scientists and engineers. Recent research by Beckstead and Brown (2006) indicates that economic growth can be predicted on the basis of the concentration of human capital, however, this is not necessarily linked to the influence of urban amenities since metropolitan areas have experienced rising wages with or without urban amenities, as various writings have shown (Glaeser et al., 2001; Glaeser and Saiz, 2004).

The CC thesis can thus be considered as a complementary approach to the human capital model. Florida (2002, 2005) and Florida et al. (2008) actually suggest an alternative measure of human capital based on the professional occupations included in the technology and innovation, arts and culture, professionals and management, education (TAPE). Florida sees his approach to economic development (the creative-capital perspective) as a better approach than the human capital model (Manning and Darnton, 2006), but many authors consider it not to have been tested empirically (Shearmur, 2006, 2010). This model puts forward a link between a concentration of human capital and economic growth at the regional level, but this only takes into account the level of education as a measure of human capital (Simon, 1998; Shapiro, 2003; Glaeser and Saiz, 2004), whereas, Florida integrates specific categories of human capital.

Florida (2003, p.8) indicates that his theory of creative capital differs from the human capital model in two ways. First, he affirms that it identifies a specific type of human capital, people who occupy 'creative' professions, as being key to economic growth. Second, he identifies the underlying factors that shape the locational decisions of people in these professional categories. Creative capital is thus an important output from this theory. Various professional categories grouped under the acronym TAPE<sup>2</sup> are said to be attracted to metropolitan areas presenting characteristics such as a high level of tolerance of cultural diversity and a large choice in terms of social activities. According to Florida (2002), this type of human capital (creative capital) is attracted to locations where their creativity can flourish.

Some authors consider that this theory reverses the causality between the creation of amenities and attraction of workers (Shearmur, 2006, 2010) and the thesis has been the object of criticism.<sup>3</sup> Rausch and Negrey (2006) indicate that human capital and economic performance in the high technology sector predict current economic growth,<sup>4</sup> while elements related to culture and in-migration may predict future economic growth. Marlet and Van Woerkens (2004) observe that the geographic concentration of the categories of

the CC is a better indicator to predict economic growth than the human capital model, but indicate that the Bohemian index is not a very useful indicator to explain the differences in economic performance between the cities in their study. Florida's thesis therefore contributes to the body of literature which highlights the development of creative clusters, the role of 'quality of place' as well as agglomeration economies in contributing to economic growth in high tech and creative regions. However, Roy-Valex (2010) has commented and criticised some elements of the thesis, particularly regarding the role of amenities in the attraction of creative workers, and Pilati and Tremblay (2010) also put forward similar critiques, although neither have tested the CC thesis empirically. D'Ovidio (2010) argues that the CC thesis neglects the role of institutions, which she considers more important for local development than the attraction of the CC with amenities. Levine (2010) suggests that the CC thesis has led to a number of myths, and questions the relation between the presence of talents and economic development. Finally, Klein and Tremblay (2010) indicate that the CC thesis does not preoccupy itself enough with the issue of social cohesion.

Also, to further illustrate this point on the impact of the regional climate of tolerance and openness or of the criteria related to the quality of place on the attraction of professionals in the CC, we note that recent works have criticised Florida's (2005) analyses for simply suggesting correlations rather than causality which would be much more convincing (Peck, 2005; Markusen and Schrock, 2006). The recent work of Peck (2005) has also emphasised that even if a link of causality existed between the fact that a region offers a climate of tolerance and openness, and regional growth, the ways to create such a climate through public policy have yet to be found. Moreover, Peck (2005) insists on the possible consequences of urban policies that embrace the 'creativity package' proposed by Florida. According to Peck (2005), creative-city strategies actually commodify arts and cultural resources to serve urban competition. Peck (2005, pp.763–764) also warns that creative-city strategies constitute new objects of governance that lead to gentrification and are organised around short-term projects rather than progressive goals such as poverty alleviation and environmental sustainability. In a more recent work, Peck (2009) argues that creative-city strategies reinforce neoliberal forms of politics. In fact, these strategies – also labelled as a 'fast fix in a neoliberal urban conjuncture' – are based on the creation of localised lifestyle facilitation instead of promoting meaningful social action at a broader scale and managed by governmental intervention (Peck, 2009). It is beyond the scope of this paper to analyse the possible implementation of Florida's thesis of economic development but the link put forward by Peck (2005, 2009) between a neoliberal conjuncture and the reliance on creative-city strategies to foster economic development is an interesting one.

Work on cultural clusters also presents similar critiques and criticisms, since it tries to show how certain factors can attract creative, cultural workers, and to explain how these can contribute to the vitality of certain cities (Pilati and Tremblay, 2008). In general, factors considered to be attractive to creative/cultural workers in creative or cultural clusters include the following: cultural diversity, a friendly welcoming environment, open minded points of view, safety, quality of life, lifestyle, pace of work, cost of housing, density/urban form, availability of green spaces and natural features, public transportation, cleanliness, pleasant climate and location. Vivant (2010) has criticised the

concept of the creative city for its location within a neoliberal policy context, and has indicated that it should possibly be thought of as a new social and urban utopia, since it offers the advantage of going beyond the industrial view of the city, towards an alternative urban paradigm.

However, Florida's (2005) views do put forward the importance of amenities and thus differentiate themselves from more traditional spatial economics centred on costs, prices, distances and other factors. They may support the works known as the 'new socio-economic geography' (Benko and Lipietz, 2000). The work that has been done on the role of territory in restructuring Fordist economic space (Markusen, 1996; Storper and Scott, 1989), on industrial districts (Piore and Sabel, 1984), and on the arrangements that govern modes of industrial development (Salais and Storper, 1993) have highlighted the connection between territorial proximity and socioeconomic vitality. Meanwhile, the more recent works on cultural amenities present some refinements to these views by identifying specific sources to this socioeconomic vitality. The relations have also been nuanced by analyses showing that economic dynamism is associated with rather complex systems where social, economic and political stakeholders ensure a form of flexible governance (Amin and Hausner, 1997; Borja and Castells, 1997) and also that territorial proximity must be combined with other forms of proximity (relational, institutional, cultural) so as to generate innovative socio-economic dynamics or regional systems of innovation (Doloreux, 2002; Klein et al., 2007).

Montréal is often cited as an attractive city by creative people because of amenities such as the many festivals that occur there during the summer (jazz, film, Francofolies, just for laughs, etc.) and because of the presence of a gay district (Rantisi, 2009). Although sparse, some recent research has begun to look into the factors that attract and retain talent in Montreal (Rantisi, 2009; Rantisi and Leslie, 2008; Pilati and Tremblay, 2008).

Regarding the percentage of creative, artistic ('Bohemian') and technical workers, Rantisi (2009) shows that Montreal ranks close to the other major cities in Canada and is clearly above the Canadian average. Beckstead and Brown (2006) show that there is a link between the criteria related to the quality of place (which includes criteria related to climate, cultural activities and tolerance of social diversity) and the attraction of the workforce employed in science and technology fields. However, the relationship between the two is not systematic over time which leads the authors to conclude that the concentration of scientists and engineers has to be combined with other types of human capital to understand urban growth.

Recently, Florida et al. (2008) have shown that human capital and the CC (occupational skills) play different but complementary roles regarding economic growth at the regional level. They indicate that certain professional occupations have more impact on regional development than others. According to their analysis, education and healthcare workers have little effect in comparison with those in computer science, engineering, management and business-related occupations. Research (Atkinson and Court, 1998; National Science Board, 2004) has also shown that technological innovation and knowledge are driven by the workforce in science and technology fields. However, the influence of the quality of place on the attraction and retention of this workforce remains to be investigated.

The CC thesis puts forward criteria of attraction and retention of labour which we used in the design of our questionnaire: openness to creativity, the level of tolerance of social diversity, and the lifestyle associated to a city. It is important for analysing the CC

thesis that we compare the impact of these criteria for attraction and retention of labour in comparison with more traditional criteria for measuring urban attraction such as the availability of job opportunities or social networks. Our aim is thus to compare the criteria put forward in the CC thesis, with other criteria which might also have an influence on the attraction and retention of knowledge workers, and to study these results according to their place of birth.

To conclude the literature review, we recall that the authors that put the accent on proximity consider that it is essential for innovation and creativity, while Jacobs (1961, 1969, 1984) put the accent on diversity of population to explain creativity in cities. As for Florida (2005), he insists on the fact that amenities that contribute to quality of place are essential to attract the creative workers (artists as well as science and technology workers). Critiques of Florida's thesis (Shearmur, 2006 and others) have rather supported the opposite view, that the presence of jobs are essential to attract science and technology workers and many other creative (film, multimedia or others).

We cannot test all these elements, especially the link between diversity and actual innovation and creativity, but we wanted to see if amenities and quality of place do attract ST workers, whom we consider as a proxy for knowledge workers. This is an important policy issue since many cities are trying to develop attractive amenities and quality of place strategies in order to attract these science and technology workers and to foster innovation and creativity.

Thus, on the basis of the concept explained above that various amenities related to quality of place or other criteria (presented in the next section) can attract or retain workers, we undertook our research to determine which are the criteria put forward by students (future knowledge workers) as factors of attraction and retention in a city and whether they do correspond to the amenities put forward in the CC thesis, or whether other more traditional factors (such as quality of university, jobs, etc.) may be as important, or more.

### **3 Research design and methodology**

Since Montreal and its business community compete with other cities to attract and retain firms and workers in the high tech sector, we undertook this research to gain a better understanding of the factors that contribute to the attraction and retention of labour in the high tech and scientific sectors. Since these sectors are not highly unionised, it is thus difficult to obtain lists of workers in these sectors. Therefore, we used a 'substitute' for knowledge workers: graduate students soon to be seeking employment in science and technology fields (Smith et al., 1991).

Other research on attraction and retention of graduates has confirmed that Montreal differs from other Canadian cities such as Toronto and Vancouver, in that Montreal is mostly attracting graduate students locally (from other regions of Quebec), while cities such as Toronto or Vancouver are better able to attract students from international locations (Polèse et al., 2005).

We used online questionnaires to collect our data. Our method is based on a sample which is intentional and non-probabilistic. We contacted the departments of science and technology disciplines at universities in Montreal in order to give the students access to the URL link of the questionnaire. We received answers from some 529 students from

francophone universities offering programs in science and technology: UQÀM, École de Technologie Supérieure, École Polytechnique, University of Montréal. The respondents are at the Bachelor, Master and PhD levels. Our objective was to develop a better understanding of the criteria influencing the mobility of graduate students looking for their first job in their chosen field. The questions concerned the following themes: the attractiveness of their city as a place to study, the attractiveness of their city as a place to work and the capacity of the city to retain its graduated students. Regarding the analysis of the results, we used two types of statistical tests: the Wilcoxon and Mann-Whitney tests which compare the results and give a comparison of the importance of the various factors. However, in this paper, we do not include the Wilcoxon tests in the tables presented as we already described these results in an earlier paper.<sup>5</sup> We explain now why we used these non-parametric tests and not the usual parametric tests. Parametric tests are usually more powerful than non-parametric tests but some conditions need to be filled in order to use them. One of them is that the distribution of the dependant variable follows a Gaussian distribution. Ordinal variables do not follow this condition because their interval is fluctuating and their value does not have a meaning by itself (it needs to be compared to another measure to be useful). This is why non-parametric tests were used to analyse our data. Several non-parametric tests could be used working with a non-Gaussian distribution variable, but specific tests have been built for comparing ordinal variables. They are the 'Mann-Whitney U', used with two independent samples, and the 'Wilcoxon', used with repeated measures on one sample. These tests attribute ranks for compared affirmations individually for each respondent, add these ranks and compare them to the corresponding measure (the 2nd sample for Mann-Whitney, and the 2nd measure on the same sample for Wilcoxon). Moreover, their effect sizes are relatively easy to calculate. This is a valuable asset for comparing the size of the differences with large sample sizes. Moreover, the Mann-Whitney U tests are specifically designed to calculate the difference between two scores within one group for ordinal variables. These are the test that we used in this paper because we compare the results according to the students' place of birth. As it is shown in the tables, we compare the results for three groups: students born in Montreal, students born in the Province of Quebec and students from abroad. This type of test also provides an opportunity to calculate the importance of an effect. It is important to note that the level of significance is not sufficient to qualify a difference between two scores as small, medium or large, especially with a big sample size. It is thus possible to differentiate the importance of two significant differences. Consequently, using the effect size, this analysis takes into account the number of respondents and offers an opportunity to qualify precisely the differences between the criteria.

We evaluated the size of the difference between the criteria using the scale of Cohen's standard which enables to measure the effect size of the difference between the criteria taking into account the size of each group of students; the difference is either small, medium or large ( $r < 0.5$ : small;  $0.5 < r < 0.8$ : medium;  $r > 0.8$ : large). As we already mentioned, this questionnaire was developed using ordinal variables. For most of the questions, respondents were asked to rank order their answers according to their personal preference. Therefore, we also calculated the effect size of the differences and used the scale of Cohen to measure them. The tables present the mean rank for each of the criteria and the results of the Mann-Whitney test. The scale used is from one to three, one to four, or one to five depending on the number of criteria being tested. The criteria which have a mean rank close to rank one are considered to be the ones with the most

impact on the attraction and retention of students. We selected the criteria according to our research objectives of comparing criteria related to quality of place and criteria related to career objectives, and after looking at the general data, we decided to distinguish the Montreal students according to their place of origin to see if this factor had an impact as we thought it might. Regarding the criteria used in the questionnaire, the following are the definitions we used:

- *Quality of the university*: this refers to the quality of the university as an institution and also to the quality of the programs available in science and technology.
- *Quality of work*: this refers to a work which is stimulating and which corresponds to the academic background of the student and to his or her career objectives.
- *Quality of life*: this refers to characteristics like the level of security, the social welfare, the quality of the urban environment, the quality of public transport, etc.
- *Level of tolerance*: this refers to low barriers of entry to human capital (e.g., ethnic and cultural diversity are elements having a positive impact on the level of tolerance of a city according to the CC thesis).
- *Lifestyle*: this refers to the elements offered by a city in terms of lifestyle. It includes the possibility to have access to cultural and social activities. In our questionnaire, we refer to the following characteristics: international festivals, the diversity in choice of restaurants, the nightlife, and art galleries.
- *Openness to creativity*: this criteria is linked to the level of social tolerance of a city. According to Florida (2003), places gain a creative advantage from their ability to attract people from a wide range of backgrounds.

We also conducted some 14 interviews with students in science and technology disciplines in Montreal between September 2007 and January 2008 in order to gain qualitative insights and complementary information. We explored the following themes in the interviews: the choice of Montreal as a place to study, the criteria influencing the choice of a destination once graduated (criteria related to career opportunities, the social network and criteria related to the quality of place), and the attractiveness of Montreal as a place to live.

#### **4 Results**

As mentioned above, we wanted to understand the importance of the various criteria related to quality of place or of the presence various urban amenities in the attraction and retention of knowledge workers in the case of Montreal and we analysed this according to the place of birth of students, since this could have an impact on the views of these workers. The details of analysis follow, but we will see that students choose universities-based primarily on the quality of the university, and only after this come quality of life factors. We also show that students make career decisions-based primarily on the quality and pay of available jobs, and then proximity to friends and family, with quality of life factors less important than any of these other elements. Finally, our results show that foreign-born students are more sensitive to quality of life and quality of place

factors (which may also have partly influenced the migration decision) but they are also primarily driven by economic factors when they make job location decisions.

Table 1 shows the criteria which influence the choice of students to come study in Montreal. We can see that students born abroad give less importance to the quality of the university than the two other groups (lower numbers indicate more importance), but these students still consider the university as the most important criteria to bring them to study in Montreal. Québec<sup>6</sup> students are the ones that most value the Montreal universities as a factor of attraction. Quality of life comes next in terms of importance and level of tolerance comes last. Although this criterion was considered important by Florida, it is less important in comparison with the other two factors, but is more important for the students of foreign origin than for those from Montreal or Canada. This likely indicates that students from abroad are more attracted than the two other groups by cities with a socially tolerant urban environment. In regards to the quality of life, the Mann Whitney tests show that students born in Montreal are more attracted by this criteria than students born in other parts of Quebec ( $U = 15,109.5$ ,  $p < 0.5$ ,  $r = 0.14$ ) although the effect size of the difference is very small ( $r = 0.14 < 0.5$ ). The students from abroad consider this criteria less in comparison with the students born in Montreal ( $U = 6,515.5$ ,  $p < 0.5$ ,  $r = 0.15$ ) although the effect size of the difference is small ( $r = 0.15$ ). There is no significant difference between the groups of students born elsewhere in Quebec and those from abroad regarding this criterion. In regards to tolerance for diversity, there is no significant difference between the group of students from elsewhere in Quebec and those from Montreal. Students from abroad give more importance to this consideration than the students from Montreal ( $U = 5,030.5$ ,  $p < 0.5$ ,  $r = 0.35$ ) but the effect size of the difference is small ( $r = 0.35$ ); Foreign students also give more importance to this criteria than the group of students from elsewhere in Quebec ( $U = 10,320.5$ ,  $p < 0.5$ ,  $r = 0.4$ ), but here also the effect size of the difference is small ( $r = 0.4$ ).

**Table 1** Criteria influencing choices to study in Montreal

<i>Criteria</i>		<i>Place of birth</i>					
		<i>Montreal</i> ( <i>n</i> = 125)	<i>Québec</i> ( <i>n</i> = 281)	<i>Montreal</i> ( <i>n</i> = 125)	<i>Abroad</i> ( <i>n</i> = 123)	<i>Québec</i> ( <i>n</i> = 281)	<i>Abroad</i> ( <i>n</i> = 123)
Quality of the university	Mean rank	m = 1.44	m = 1.19	m = 1.44	m = 1.68	m = 1.19	m = 1.68
	Mann Whitney U	U = 14,038.5		U = 6,515.5		U = 11,517.5	
	Sig. and effect size	p < 0.05 r = 0.23		p < 0.05 r = 0.15		p < 0.05 r = 0.35	
Quality of life	Mean rank	m = 1.83	m = 1.99	m = 1.83	m = 2.08	m = 1.99	m = 2.08
	Mann Whitney U	U = 15,109.5		U = 6,281.5		U = 15,979.5	
	Sig. and effect size	p < 0.05 r = 0.14		p < 0.05 r = 0.17		Non-sig.	
Level of tolerance	Mean rank	m = 2.72	m = 2.81	m = 2.72	m = 2.23	m = 2.72	m = 2.23
	Mann Whitney U	U = 16,700.5		U = 5,030.5		U = 10,320.5	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.35		p < 0.05 r = 0.40	

Notes: Scale: 1 = very important; 2 = somewhat important; 3 = not so important

Table 2 looks at the factors that have to do with the retention of students, and shows that the quality of work has a greater impact on the retention of students born in Canada, yet much less so for those born abroad. Lifestyle is more important for those born in Canada (lower numbers indicate more importance) while the quality of work and lifestyles are as important for those born abroad as for those born in Canada.

**Table 2** Criteria influencing choices to stay in a city once graduated

Criteria		Place of birth					
		Montreal (n = 124)		Québec (n = 279)		Abroad (n = 122)	
Quality of work	Mean rank	m = 2.09	m = 1.74	m = 2.09	m = 2.82	m = 1.74	m = 2.82
	Mann Whitney U	U = 14,252		U = 6,471.5		U = 12,080.5	
	Sig. and effect size	p < 0.05 r = 0.15		p < 0.05 r = 0.13		p < 0.05 r = 0.25	
Lifestyle	Mean rank	m = 3.21	m = 3.16	m = 3.21	m = 2.82	m = 3.16	m = 2.82
	Mann Whitney U	U = 16,950		U = 6,346.5		U = 14,592.5	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.14		p < 0.05 r = 0.12	
Cost of living	Mean rank	m = 3.95	m = 4.02	m = 3.95	m = 3.48	m = 4.02	m = 3.48
	Mann Whitney U	U = 16,459.5		U = 5,896.5		U = 12,578	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.20		p < 0.05 r = 0.22	
Quality of life	Mean rank	m = 3.46	m = 3.38	m = 3.46	M = 2.95	m = 3.38	m = 2.95
	Mann Whitney U	U = 16,602		U = 5,858		U = 13,749.5	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.20		p < 0.05 r = 0.16	
Social network	Mean rank	m = 2.27	m = 2.64	m = 2.27	M = 3.23	m = 2.64	m = 3.23
	Mann Whitney U	U = 14,055		U = 4,968		U = 13,305.5	
	Sig. and effect size	p < 0.05 r = 0.15		p < 0.05 r = 0.30		p < 0.05 r = 0.18	

Notes: Scale: 1 = very important, 2 = important, 3 = somewhat important, 4 = not so important, 5 = not at all important

Students born in Montreal and in other regions of Québec often have similar views, and the table shows that many of the differences between the groups of students are not significant. This is the case for cost of living, quality of life and lifestyle. All other differences between groups are significant, but the effect sizes are small (all are below 0.5). In regards to the quality of work e.g., which is the most important criteria for those born in Québec and in Montreal, we can see that it is more important for those born in other regions of Québec than for those from Montreal but the effect size is small (U = 14,252, p < 0.05 r = 0.15). It is more important for those born in Canada than for those born abroad, but again the effect size is small (U = 12,080.5, p < 0.05 r = 0.25).

Regarding the criteria related to lifestyle, we can conclude that the students from abroad give more importance to the criteria compared to the two other groups ( $U = 6,346.5$ ,  $p < 0.05$ ,  $r = 0.14$ ); ( $U = 14,592.5$ ;  $p < 0.05$ ;  $r = 0.12$ ), although the effect size of the differences are small in both comparisons. Regarding the criteria of the quality of life, again there is no significant difference between the groups born in Montreal and those born elsewhere in Quebec. We found similar results for the criteria for lifestyle, where students from abroad attached more importance to this criteria compared to the two other groups ( $U = 5,858$ ,  $p < 0.05$ ,  $r = 0.2$ ); ( $U = 13,749.5$ ;  $p < 0.05$ ;  $r = 0.15$ ) and the effect size of the differences are small. In regards to the criteria for the importance of social network, not surprisingly, the group of students from Montreal attached more importance to this criteria as a factor of retention than did the two other groups ( $U = 14,055$ ;  $p < 0.05$ ,  $r = 0.15$ ); ( $U = 4,968$ ;  $p < 0.05$ ;  $r = 0.30$ ). We can also conclude that the group of foreign students is the group which gives the least importance to this criteria compared with the two other groups. This group may be more geographically mobile (less dependent on social networks) than the two other groups.

**Table 3** Criteria influencing choices to *come and live* in a city (Montreal) once graduated

Criteria		Place of birth					
		Montreal ( <i>n</i> = 125)	Québec ( <i>n</i> = 281)	Montreal ( <i>n</i> = 125)	Abroad ( <i>n</i> = 122)	Québec ( <i>n</i> = 281)	Abroad ( <i>n</i> = 122)
Quality of work	Mean rank	m = 1.48	m = 1.37	m = 1.48	m = 1.95	m = 1.37	m = 1.95
	Mann Whitney U	U = 16,744.5		U = 5,685		U = 11,839.5	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.24		p < 0.05 r = 0.29	
Level of tolerance	Mean rank	m = 3.31	m = 3.53	m = 3.31	m = 2.68	m = 3.53	m = 2.68
	Mann Whitney U	U = 15,609		U = 5,347		U = 10,196	
	Sig. and effect size	p < 0.05 r = 0.10		p < 0.05 r = 0.28		p < 0.05 r = 0.36	
Openness to creativity	Mean rank	m = 2.64	m = 2.96	m = 2.64	m = 2.67	m = 2.96	m = 2.67
	Mann Whitney U	U = 13,991.5		U = 7,546.5		U = 14,166	
	Sig. and effect size	p < 0.05 r = 0.18		Non-sig.		p < 0.05 r = 0.15	
Level of salary	Mean rank	m = 2.2	m = 2.12	m = 2.2	m = 2.68	m = 2.12	m = 2.68
	Mann Whitney U	U = 13,417.5		U = 7,075		U = 12,222	
	Sig. and effect size	p < 0.05 r = 0.20		Non-sig.		p < 0.05 r = 0.24	

Notes: Scale: 1 = important, 2 = somewhat important, 3 = not so important, 4 = not at all important

Table 3 develops on the criteria that would influence the various groups to stay and live in Montreal once they graduate, if they were not already here. Quality of work is still the first factor for all groups, although it appears somewhat more important for those born in Canada, while students from Montreal accord this criterion slightly less importance. Meanwhile, the quality of work is even less important for those born abroad. The

difference between those born in Montreal and in Canada is again not significant, but it is somewhat greater with those born abroad. We can see that those born in Québec give more importance to quality of work than those born abroad although the effect size is small ( $U = 11,839.5$ ,  $p < 0.05$   $r = -0.29$ ). Those born in Montreal also attach more importance to quality of work than those born abroad, but again with a small effect size ( $U = 5,685$ ,  $p < 0.05$   $r = 0.24$ ). The comparisons between the different groups show some significant differences in all other cases, but the effect size is small in all cases ( $r$  under 0.5).

Table 3 thus clearly confirms that the group of foreign students gives less importance than the two other groups to the criteria related to career opportunities (quality of work and level of salary) ( $U = 5,685$ ;  $p < 0.05$ ;  $r = 0.24$ ); ( $U = 11,839.5$ ;  $p < 0.05$ ;  $r = 0.29$ ). The level of tolerance is also more important for this group compared to the two other groups as a factor of attraction to work in Montreal ( $U = 5,347$ ;  $p < 0.05$ ;  $r = 0.28$ ); ( $U = 10,196$ ;  $p < 0.05$ ;  $r = 0.36$ ). Regarding the openness to creativity, we found no significant difference between the group of foreign students and the group of students born in Montreal, and we can only conclude that these two groups give more importance to this criterion than the group of students from elsewhere in Quebec.

In the interviews as in the questionnaire, criteria related to the quality of place do not appear to have a major impact on the retention of students as stated by one of the respondents<sup>7</sup>: “I know Montreal is a lively place, a tolerant city, it’s important, but it’s mainly that there are good companies to work for here. If there were only festivals here and I only could get a job at minimum wage, I would not stay of course. ...In my case, it is more the reputation of the employer... as for entertainment, we can create it ourselves.” (Interview 2).

Montreal is the major metropolitan area in the Province of Quebec and it clearly acts as a kind of magnet for the students in science and technology, especially for the students born in the province but outside Montreal: “Employment in science and technology in Montreal are probably a reason to explain why so many students choose Montreal to study and also as a place of work for their first employment” (Interview 8). The interviews thus confirm that career opportunities are the main factor influencing the mobility of graduate students in science and technology even if it involves leaving the city: “I will not sacrifice my career aspirations so that I can stay in the city; my interest for my work is more important than being surrounded by people” (Interview 9).

Although it is not their main concern, some students do appreciate the lifestyle and amenities: “there are bicycle paths in Montreal, good public transportation, and the architecture is nice – I live in the Plateau” (Interview 8). Social networks are also mentioned, but again not a priority: “I have to admit that I didn’t talk about the social network spontaneously, but it is important, and plays into the decision; I would not want to be too far ...” (Interview 4).

Even if the students appreciate an urban lifestyle, it is apparently not a major concern when choosing a place to work, as stated by this respondent: “The first criteria is an interesting work related to what I have been studying; of course if I have the choice I will take a city with cultural activities, diversity, etc.” (Interview 4). However, work opportunities is not the only criteria explaining the mobility of graduate students in science and technology: “Work is work, I can focus on work but social aspects are also important because if you are not well socially or in your private life you cannot invest as much in your work either.” (Interview 6).

If the openness to creativity does not appear as a major factor in the attraction of the workforce in science and technology in the results of our questionnaire, this criteria is considered as a positive point for Montreal compared with other cities in Quebec as stated by some of the respondents: “The first thing for me is to find a job I like, then the salary. I would not go in a lab in Abitibi or a peripheral region like that, because I’d miss the cultural side. When you get out of your job, you want to do other things, get out of your usual world, compensate. Montreal is an excellent city for that.” (Interview 3).

Another says: “Some computer programmers need to be creative, I am the kind of person who likes to think about what I am doing when I have spare time. If you live in an environment where things are happening you are more creative, maybe it has an influence on your work, maybe you are better at what you are doing [work] as well...there are a lot of intellectuals in the Plateau district, I can relate to those people and interact with them, in a little town like Joliette where I come from it was not possible.” (Interview 5).

Workers in creative sectors such as music, multimedia and gaming, e.g., often indicate that these elements are important for them (Rantisi, 2009) and some highlight the link between their environment and their level of creativity at work: “It plays on your morale, when you are in an environment where things are happening, you have a better morale, you are more creative, you are better in your work; both are linked of course.” (Interview 7).

The issue of tolerance is also a positive point for Montreal which is considered as a city where newcomers feel at home. Two students coming from abroad refer to this: “When I arrived here I didn’t know anyone but I felt at home... you meet people from everywhere so you feel you can find a bit of your home somewhere.” (Interview 8).

Another student from abroad states this point about Montreal: “[A tolerant environment] “For me it is important, I have my own cultural background but I like to interact with people from everywhere in the world... I associate tolerance with the cultural aspects of the city and diversity, from my point of view, Montreal is a very tolerant city, one of the most tolerant in Canada...a city with different cultural backgrounds and cultural activities has more chance to develop a positive image internationally. This can probably have a positive impact on economic development and on the attraction of firms as well.” (Interview 6).

Table 4 gives some insights into the factors that make Montreal attractive. The data shows that the students all rank the cultural activities first, followed by the variety of restaurants and quality of the urban and natural environment for those born in Montreal. Meanwhile, security and the ethnic diversity are both tied for last place in the rankings. The Montreal-born put quality of the urban and natural environment next after cultural activities followed in order by the diversity of restaurants, security and ethnic diversity.

The foreign-born put ethnic diversity second to cultural activities, and security in third place. This shows that foreign students have a different view on the factors of attraction and retention which is significant since to this day, research usually lumps all local residents in a single group. Our results show that it is important to take the origin of students into account, especially when it concerns factors of attraction for the city, beyond employment opportunities, which are clearly important for all.

We can see that there are no significant differences between the various groups in regards to the importance given to the urban and natural environment. However, there are significant differences between the groups in all other comparisons, although the effect sizes are all small. The differences are the greatest between the students born abroad and

those born in other regions of Québec as can be seen in the last column (where *r* is usually higher) but still the effect size remains low (under 0.5).

**Table 4** Criteria influencing the attractiveness of a city (Montreal)

Criteria		Place of birth					
		Montreal ( <i>n</i> = 125)	Québec ( <i>n</i> = 278)	Montreal ( <i>n</i> = 125)	Abroad ( <i>n</i> = 122)	Québec ( <i>n</i> = 278)	Abroad ( <i>n</i> = 122)
Quality of the urban and natural environment	Mean rank	m = 2.88	m = 3.14	m = 2.88	m = 3.00	m = 3.14	m = 3.00
	Mann Whitney U	U = 15,346.5		U = 7,253		U = 15,970.5	
	Sig. and effect size	Non-sig.		Non-sig.		Non-sig.	
Cultural activities	Mean rank	m = 2.16	m = 1.86	m = 2.16	m = 2.59	m = 1.86	m = 2.59
	Mann Whitney U	U = 15,008		U = 6,060.5		U = 11,052.5	
	Sig. and effect size	p < 0.05 r = 0.12		p < 0.05 r = 0.18		p < 0.05 r = 0.29	
Variety of restaurants	Mean rank	m = 3.00	m = 2.57	m = 3.00	m = 3.9	m = 2.57	m = 3.9
	Mann Whitney U	U = 14,476		U = 4,939		U = 8,265	
	Sig. and effect size	p < 0.05 r = 0.14		p < 0.05 r = 0.31		p < 0.05 r = 0.42	
Ethnic diversity	Mean rank	m = 3.56	m = 3.7	m = 3.56	m = 2.73	m = 3.7	m = 2.73
	Mann Whitney U	U = 16,404		U = 5,054.5		U = 10,207	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.30		p < 0.05 r = 0.33	
Security	Mean rank	m = 3.39	m = 3.7	m = 3.39	m = 2.76	m = 3.7	m = 2.76
	Mann Whitney U	U = 15,051.5		U = 5,718.5		U = 10,727	
	Sig. and effect size	p < 0.05 r = 0.11		p < 0.05 r = 0.22		p < 0.05 r = 0.30	

Notes: Scale: 1 = important; 2 = somewhat important; 3 = not so important; 4 = not at all important

Clearly, the results of our questionnaire show that the quality of the urban and natural environment is important to students, as one mentioned in the interviews: “Montréal is a city which is accessible, very secure, there are green spaces and a sociocultural activities; there is everything, museums, cafés, people from everywhere, and all this is quality of life. Festivals, cultural activities bring warmth to Montreal and diversity too. For me this is important.” (Interview 6).

One mentions the social network: “I love Montréal for the vitality of the interactions that I can have with people. I come from the countryside and each one minds his own business. I arrived in the city and here there is effervescence and life.” (Interview 9). And another: “some places are closed, while Montreal is recognized everywhere as a city where, wherever you come from, you will always meet people, or find places to talk to people.” (Interview 3).

The interest in lifestyle in Montreal can also change from one student to another as indicated by this respondent coming from a Quebec region to study in Montreal: “You have all kinds of scenarios, some are after the festivals but I don’t think it is a major criteria to settle in Montreal, many students are ready to move after they are finished with their studies, some came for the programs in Montreal in science and technology and then they come back to work in the regions, some stay in Montreal because the employment opportunities in science and technology are in Montreal.” (Interview 2). All in all, the predominance of the social network and environment is clearly not dominant in the interviews. It depends partly on the place where they come from as stated by this respondent: “Montreal and Ottawa, I will put them in the same league, those are cities of approximately the same size but if you are comparing Montreal and Trois-Rivières, this is not the same type of urban dynamic, in this case we could consider other factors than just work.” (Interview 2).

**Table 5** Factors intervening the decision to stay in a city (Montreal) once graduated

Criteria		Place of birth					
		Montreal (n = 125)	Québec (n = 278)	Montreal (n = 125)	Abroad (n = 122)	Québec (n = 278)	Abroad (n = 122)
Level of salary	Mean rank	m = 2.2	m = 2.23	m = 2.2	m = 2.24	m = 2.23	m = 2.24
	Mann Whitney U	U = 17,248.5		U = 7,585		U = 16,784	
	Sig. and effect size	Non-sig.		Non-sig.		Non-sig.	
Quality of work	Mean rank	m = 1.42	m = 1.31	m = 1.42	m = 1.76	m = 1.31	m = 1.76
	Mann Whitney U	U = 15,450.5		U = 6,033		U = 11,872	
	Sig. and effect size	p < 0.05 r = 0.11		p < 0.05 r = 0.20		p < 0.05 r = 0.28	
Level of tolerance	Mean rank	m = 3.6	m = 3.65	m = 3.6	m = 2.89	m = 3.65	m = 2.89
	Mann Whitney U	U = 16,318		U = 4,666		U = 9,646.5	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.37		p < 0.05 r = 0.40	
Authenticity of the urban milieu	Mean rank	m = 2.77	m = 2.79	m = 2.77	m = 3.09	m = 2.79	m = 3.09
	Mann Whitney U	U = 17,070.5		U = 6,092		U = 12,948	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.18		p < 0.05 r = 0.20	

In regards to the factors for staying in a city once they graduate (Table 5), the students again place the quality of work first. The students from Québec give it the most importance, more so than those in Montreal and those from abroad, but the effect size is small in both cases ( $U = 18,450.5$ ;  $p < 0.05$   $r = 0.11$ ), ( $U = 11,872$ ;  $p < 0.05$ ;  $r = 0.28$ ). The level of tolerance is more important for the students from abroad and here the effect size is more significant, although still relatively small ( $p < 0.05$   $r = 0.40$ ). The level of salary comes second in the list of factors and there are no significant differences between the groups of students. The authenticity of the urban milieu is more important to students from Montreal than to those from abroad, and there is actually no significant difference

between those from Montreal and Québec, and only a small size effect for the difference between those from abroad and those from Montreal or from Canada ( $p < 0.05$   $r = 0.18$ ,  $r = 0.20$ ). We can conclude that the group of foreign students is the group of students that give the least importance to the authenticity of the urban milieu compared with the two other groups.

Table 6 shows that few students would hesitate to leave for better career opportunities, a factor that is clearly a determining factor in the decisions of students, much more so than the criteria related to quality of place. These results are interesting if we consider the different groups because it confirms that the lifestyle of Montreal has more influence on the retention of students from abroad than for the two other groups.

The students born abroad are the most likely to hesitate to leave (total of 49% of yes and likely to hesitate to leave), followed by those born in Québec, and finally those born in Montréal. Over two thirds of those born in Québec are not likely (38%) or would not (30%) hesitate to move to another city, 58% of those from Montreal say the same and 51% of those born abroad would also not hesitate to leave. The groups are thus pretty divided between the options.

**Table 6** Still stay in Montreal if received better career opportunity elsewhere (%)

	Montreal (n = 125)	Québec (n = 278)	Abroad (n = 123)
Yes	14.4	9.6	21.5
Likely	28	19.9	27.3
Not likely	36	38.8	39.7
No	21.6	30.7	11.5
Total	100	100	100

Table 7 confirms that students from Montreal are more likely to stay to work in Québec, while Europe is the favoured alternate destination, then the rest of Canada. The USA would then be the less favoured destination for this group. For those born in Québec, a city in Québec is even more possible, and other cities in Canada, Europe or in the USA do not seem very attractive to them. Meanwhile, moving to other parts of Canada and Europe are possibilities for approximately 11% of this group, while only 4% would consider moving to the USA. Finally, those born abroad are clearly more mobile, being most likely to consider other cities in Canada (41%), followed by Europe (26%), then in other parts of Québec (16%), and finally in the USA (15%). Thus, it appears that the latter group, the foreign-born, are the most difficult to attach and retain in Montreal. This surely has some impacts in terms of policies, and if Québec wants to recoup its investment in the education of the foreign-born talents, it should be actively trying to link them to job opportunities. Policies should also take into account the importance that students from abroad give to the city's ethnic diversity and security.

We have not looked into the issue of language and the preference of Quebec students (outside Montreal) towards maintaining their francophone culture, but this could clearly be an explanation for the fact that a majority of students originally from Quebec (Canada) would remain here after their studies.

We noticed in the interviews that students born in Quebec (outside Montreal) were sometimes not open to moving elsewhere even if there were employment opportunities there: "Someone used to the lifestyle of the Quebec regions will not be able to work in

New York, although some students do not like Montreal because they think it is too fast especially when they come from the Quebec regions” (Interview 2).

**Table 7** Place to live after graduation (%)

	<i>Montreal (n = 125)</i>	<i>Québec (n = 281)</i>	<i>Abroad (n = 123)</i>
A city in Quebec	51.9	72.8	16.7
A city in Canada	14.8	11.5	41.2
A city in Europe	27.8	11.9	26.5
A city in the USA	5.5	3.8	15.7
Total	100	100	100

The views on Montreal therefore depend on the origin (abroad or Québec region) and as another respondent says: “I am not even looking somewhere else than Montreal for a job, if I have an offer somewhere else, exactly what I want, I will consider it, if they want me to come and work in a small city somewhere in Canada, I will not go. To move in Ontario for work? The job would have to be very interesting for me to move there, even the money would not be really a motivation. Why? Because it’s Ontario” (Interview 3).

Respondents also insist on the fact that their decision to choose a place once they graduate would be the result of a decision which includes different aspects of their life:

“It [my decision] will be a mix between the work opportunities offered by the city and the opportunities in terms of cultural activities, not the money, I don’t care, I am looking for a city with things that make me a more mature person, things that nourish my interests as a person” (Interview 9).

Criteria related to the quality of place influence the decisions of students in choosing a place to work once they graduate, as stated by this respondent coming from Europe to work in Montreal: “The quality of life is also important, even if you spend the most part of your day at work... you have to work to buy your food but in another way I won’t plan all my life according to career objectives... in another way, if I look at a map, I will not necessarily after that go to all the cities to see if I feel good in them [to choose a place to work]” (Interview 8).

And the language issue does play a role: “We are a majority of Francophones; I think a student from Concordia (Anglophone University) would be more open to moving in Canada, eventually going to Vancouver, because this would be easier for him. The only other places I hear about for working elsewhere are mainly in France, for French employers.” (Interview 2).

As we showed in another paper using the Wilcoxon tests, the hierarchy of the criteria for the all the students is as follows:

- 1 quality of life
- 2 quality of work
- 3 level of salary
- 4 level of tolerance (Darchen and Tremblay, 2010a).

However, using the Mann-Whitney tests, we found out that the foreign students accord more importance than the two other groups to the level of salary ( $U = 6,074$ ;  $p < 0.05$ ;  $r = 0.17$ ); ( $U = 11,771$ ;  $p < 0.05$ ;  $r = 0.25$ ). The group of foreign students gives the same

rank to the level of salary, the quality of work and the quality of life (according to our Wilcoxon tests). The two other groups actually rank the quality of life and the quality of work in first rank (according to the Wilcoxon tests), however as shown in Table 8, the students born in Quebec give more importance to the quality of life in comparison with the two other groups ( $U = 14,590$ ;  $p < 0.05$ ;  $r = 0.13$ ); ( $U = 10,024$ ;  $p < 0.05$ ;  $r = 0.34$ ), meaning that they are not necessarily coming to study in Montreal as the result of a choice related to the quality of place of this city. Table 8 also confirms that the group of foreign students gives more importance to the level of tolerance as a factor of attraction to another city than the two other groups ( $U = 5,028.5$ ;  $p < 0.05$ ;  $r = 0.34$ ) if we compare with the group born in Montreal; ( $U = 10,882$ ;  $p < 0.05$ ;  $r = 0.37$ ).

**Table 8** The most important criteria for leaving Montreal

Criteria		Place of birth					
		Montreal (n = 124)	Québec (n = 278)	Montreal (n = 124)	Abroad (n = 120)	Québec (n = 278)	Abroad (n = 120)
Level of salary	Mean rank	m = 2.54	M = 2.75	m = 2.54	m = 2.21	m = 2.75	m = 2.21
	Mann Whitney U	U = 14,934.5		U = 6,074		U = 11,771	
	Sig. and effect size	p < 0.05 r = 0.12		p < 0.05 r = 0.17		p < 0.05 r = 0.25	
Quality of work	Mean rank	m = 1.82	m = 1.8	m = 1.82	m = 2.21	m = 1.82	m = 2.21
	Mann Whitney U	U = 17,003		U = 5,635		U = 12,474.5	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.22		p < 0.05 r = 0.22	
Quality of life	Mean rank	m = 1.87	M = 1.64	m = 1.87	m = 2.42	m = 1.64	m = 2.42
	Mann Whitney U	U = 14,590		U = 5,394		U = 10,024	
	Sig. and effect size	p < 0.05 r = 0.13		p < 0.05 r = 0.25		p < 0.05 r = 0.34	
Level of tolerance	Mean rank	m = 3.75	m = 3.8	m = 3.75	m = 3.14	m = 3.8	m = 3.14
	Mann Whitney U	U = 16,822.5		U = 5,028.5		U = 10,882	
	Sig. and effect size	Non-sig.		p < 0.05 r = 0.34		p < 0.05 r = 0.37	

## 5 Discussion

Criteria related to work opportunities have a determining influence on the attraction and retention of students, much more so than the criteria related to the quality of place. However, once this element is taken into account, it is interesting to note that secondary factors considered are not the same for the students born abroad and those born domestically. Students from abroad place greater value on ethnic diversity and security than do students from Montreal and other regions of Quebec, who probably just take this for granted. Our results show that there are similar results for students born in Quebec and for those born in Montreal.

Our research distinguishes the three groups according to their place of birth and confirms that foreign students place greater consideration on the criteria related to the quality of place than the two other groups (e.g., the lifestyle in Table 2; e.g., the openness to creativity if we compare with the group from Quebec in Table 3; e.g., the level of tolerance if we compare with the two other groups for all the tables including this criteria). However, this group does not systematically favour all of the criteria related to quality of place as this group also gives less importance to the authenticity of the urban milieu than the two other groups (Table 5). The lifestyle of Montreal also tends to be a factor of retention that has a greater impact on the group of foreign students than on the two other groups (Table 6). The group of foreign-born students is also more mobile (Table 7) than the two other groups, who are most likely to remain in Quebec once they graduate. We also showed that this group is less attached to its social network than the two other groups when asked which criteria will make them likely to stay in Montreal after they graduate. Finally, the foreign-born group tends to consider the level of salary more than the two other groups when considering leaving Montreal for another city (Table 8). The results using the Mann-Whitney test to compare our results between the different groups do not contradict our preceding works on the topic: the criteria related to career opportunities are still most important factor in explaining the mobility of foreign students compared with criteria related to the quality of place. But this group is more likely to somewhat consider criteria emphasised in the CC thesis than the two other groups. We can conclude that this group might be closer to the archetype of the CC professional although the mobility of this group is not solely driven by criteria related to the quality of place.

Table 6 confirms that the students studying in Montreal are not all considering the attractiveness of cities outside Quebec, and it is very likely that they would remain in the Canadian province for their first job. Finally, students in Montreal would mostly be looking for a better quality of life if they were to decide to move from the city (at the same rank as quality of work). This confirms that for a certain portion of the students studying in Montreal, quality of life is not necessarily a satisfactory component of life in the city. It is also likely that for a portion of the students studying in Montreal, the decision to come to the city is not necessarily an actual choice but is a necessity related to the availability of programs in science and technology and the work opportunities available there (this is especially likely for the students coming from other regions of Quebec). If the criteria related to the quality of place has less influence on the attraction and retention of students in science and technology, this does not imply that students are not considering it in their choice of a place to work once they graduate (as shown in the interviews). These criteria simply have less impact on the attraction and retention of students than the criteria related to career opportunities.

We have seen that compared to employment opportunities, the criteria related to the quality of place do not have an important impact on the attraction and retention of graduate students (future knowledge workers). However, this could change once the students have found a place to work and have established a more solid base in their career. They may then be more interested in criteria related to place, e.g., when they start building a family, a situation which often impacts on the type of place individuals want to live in. Security issues and quality of nature and environment then often become all the more important. Our research also shows that Montreal may have difficulty retaining its graduate students with the criteria of the quality of life or place, although the city is often considered as a very attractive and upbeat city for CC workers (Rantisi, 2009).

Our research also suggests that Montreal acts as a magnet for students in science and technology in Quebec because of the availability of programs in science and technology and for its work opportunities in those fields (Darchen and Tremblay, 2008). Thus, the criteria emphasised in the CC literature regarding the attraction of knowledge workers have a minor impact on the actual attraction and retention of graduate students. This may not necessarily mean that knowledge workers, once established, do not consider these criteria in their choice of place to work, and it is possible that they will later in their career, or when they have a family.

## **6 Conclusions**

The research has shown that students choose universities based primarily on the quality of the university, and secondly quality of life factors, so that the elements put forward in the CC theory as attraction factors do not seem to be dominant. Our research shows that students make career decisions based primarily on the quality and pay of available jobs, and then proximity to friends and family. It appears that quality of life factors are less important. We also show that foreign-born students are more sensitive to quality of life and quality of place factors and that this may of course have partly influenced their migration decision. However, these foreign-born students are also primarily driven by economic factors when they make job location decisions.

For a portion of the students studying in Montreal, quality of life is not necessarily a satisfactory component of life in the city. It is likely that for a portion of the students studying in Montreal, the decision to come to the city is not necessarily an actual choice but is related to the availability of programs in science and technology and the work opportunities available there (especially likely for the students coming from other regions of Quebec).

These results lead us to conclude that while there are elements of interest in Florida's arguments (quality of life factors are not irrelevant in skilled workers' location decisions), our results suggest that he may be significantly overstating the salience of quality of life factors in location decisions, even for skilled migrants, for whom ethnic diversity and a tolerant milieu are more important than for natives of Montreal.

Our research thus clearly confirms that foreign students show more interest in the criteria related to the quality of place than for the two other groups, but this is not systematic since they also give less importance to the authenticity of the urban milieu than the two other groups. The lifestyle of Montreal tends to be a factor of retention that has more impact on the retention of foreign students, and this group is also the most mobile geographically. Results also show that this group is less attached to its social network when asked which criteria will make them likely to stay in Montreal after they graduate. Finally, the foreign-born group gives more importance to the level of salary than the two other groups when considering leaving Montreal for another city.

The results presented here, differentiating the students according to origin, confirm our preceding work's arguments on the topic: that the criteria related to career opportunities still dominate when explaining the mobility of foreign students compared with criteria related to the quality of place, as is the case for the other groups. However, this group does place greater emphasis in the criteria emphasised in the CC thesis than the two others. We conclude that this group might be closer to the archetype of the CC

professional although it is evident that the mobility of this group is not solely driven by criteria related to the quality of place.

All of these results lead us to nuance some of the elements of Florida's thesis, which did not differentiate according to origin. This also means that any policy aimed at attracting and retaining knowledge workers should take into account the origin of the students or workers it is trying to attract or retain. It is clearly important to take into account not only the quality of place and the role of urban amenities, but to ensure that job opportunities are offered for the knowledge workers concerned. Yet, it is important to note also that foreign born students are much more mobile and that wages and quality of place are more important to them when compared with the Québec students.

This differentiation of students, and future knowledge workers, according to their origin is important, since recent creative-city strategies do not always take this point into account. Job opportunities appear to be the dominant factor in attraction and retention, and this would tend to confirm the views of some critics of Florida's thesis, but it is clear that there are other elements of interest in the attraction and retention of foreign-born knowledge workers or *talents*.

Concerning the limitations of this research, further research should explore certain elements in greater depth, including social network, family ties or the cultural preference towards a particular province. Language issues would also be a useful area for future research when considering the attraction and retention of graduate students. Also, preferences related to downtown, suburban or countryside/small town living are also elements that we only partly explored in the questionnaire, but which came out as quite important in the interviews.

As mentioned above, the use of students in science and technology is not a perfect substitute for science and technology workers, but it does give an indication of the elements which appear useful in attracting and retaining future workers. Future research could be done using the same questionnaire, with students in smaller Canadian or Québec cities, and also eventually with actual workers in the science and technology sectors if we were able to obtain direct access to this group.<sup>8</sup> However, given the fact that there are few collective organisations such as unions or professional associations that could be used to reach these workers, the answers given by students who are soon to be part of the CC (that cities apparently attract) give a reasonable indication of the factors of attraction within these groups. Our future work will try to confirm results with actual CC workers, although our initial contacts clearly indicated this would be difficult.

While these limits are not negligible, the results presented here still shed new information on the CC hypothesis, and since little empirical research has been done on the impact of the criteria put forward by the theory, it is worth putting forward the importance of the place of origin in the preferences of knowledge workers. The CC theory would lead us to think that knowledge workers would be attracted by urban environments characterised by criteria related to the quality of place, but we found that these criteria are not as important as career opportunities for Québec born students, and are only slightly more important for the foreign-born students. We saw that while there are some differences between foreign born students and those from Montreal and Québec, these appear more in relation to other factors (level of tolerance, security, etc), while the issue of job opportunities dominates in all groups. This leads us to question the importance of various factors of location put forward in the CC theory. However, it is interesting to note that our results do show that the criteria linked to quality of place will

have a greater impact on the attraction and retention for students from abroad than for those from Québec and Montreal, for whom they are not so important.

For the knowledge workers in general, this would lead to the conclusion that criteria related to the quality of place are not sufficient to attract and retain them, although they may have an influence. Thus, policies that would be based on the CC thesis might not be appropriate to attract and retain knowledge workers since our results suggest that Florida and the CC thesis may have significantly overstated the salience of criteria related to quality of place in location decisions, even for skilled migrants

### **Acknowledgements**

The authors would like to thank Alexandre Chabot for his work on the statistical tests for this research.

### **References**

- Amin, A. and Hausner, J. (Eds.) (1997) *Beyond Market and Hierarchy. Interactive Governance and Social Complexity*, Edward Elgar, Cheltenham, UK.
- Arrow, K.J. (1962) 'The economic implications of learning by doing', *Review of Economic Studies*, June, Vol. 29, No. 3, pp.155–173.
- Atkinson, R.D. and Court, R.H. (1998) *The New Economy Index: Understanding America's Economic Transformation*, The Progressive Policy Institute, Washington DC.
- Beaudry, C. and Schiffäuerova, A. (2009) 'Who's right, Marshall or Jacobs? The localization versus urbanization debate', *Research Policy*, Vol. 38, No. 2, pp.318–337.
- Beckstead, D. and Brown, W.M. (2006) *Capacité d'innovation: l'emploi en Sciences et en Génie Dans les Villes Canadiennes et Américaines*, Statistique Canada, Ottawa.
- Benko, G. and Lipietz, A. (Eds.) (2000) *La Richesse des Régions*, PUF, Paris.
- Borja, J. and Castells, M. (1997) *Local and Global: Management of Cities in the Information Age*, Earthscan Publications, London.
- Boschma, R.A. and Fritsch, M. (2007) 'Creative class and regional growth – empirical evidence from eight European countries', The Jena Economic Research Papers, 2-007-066, available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1023869#](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1023869#) (accessed on 10 April 2010).
- Clark, T.N. (Ed.) (2004a) 'Gays and urban development: how are they linked?', in *The City as an Entertainment Machine*, pp.221–234, Elsevier, Oxford, UK.
- Clark, T.N. (Ed.) (2004b) 'Urban amenities: lakes, opera and juice bars, do they drive development?', in *The City as an Entertainment Machine*, pp.103–140, Elsevier, Oxford.
- D'Ovidio, M. (2010) 'Le rôle des institutions dans l'économie créative', in Tremblay, R. and Tremblay, D-G. (Eds.): *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, pp.179–200, Presses de l'université du Québec and Presses de l'Université de Rennes, Québec/Rennes.
- Darchen, S. and Tremblay, D-G. (2008) 'La thèse de la «classe créative»: son incidence sur l'analyse des facteurs d'attraction et de la compétitivité urbaine', *Interventions Économiques*, No. 37, available at <http://www.telug.uqam.ca/interventionseconomiques> (accessed on 12 April 2010).
- Darchen, S. and Tremblay, D-G. (2010a) 'Attracting and retaining the workforce in science and technology: the case of Montreal', in Metaxiotis, K., Carrillo, F.J. and Yigitcanlar, T. (Eds.): *Knowledge-Based Development of Cities and Societies: An Integrated Multi-level Approach*, IGI Global, forthcoming, Hershey.

- Darchen, S. and Tremblay, D-G. (2010b) 'What attracts and retains knowledge workers/students: the quality of place or career opportunities? The cases of Montreal and Ottawa', *Cities*, Vol. 27, No. 4, pp.225–233 (Ref. No.: JCIT-D-09-00070R1).
- Doloreux, D. (2002) 'What we should know about regional systems of innovation', *Technology in Society*, Vol. 24, No. 3, pp.243–263.
- Feldman, P.P. and Audretsch, D.B. (1999) 'Innovation in cities: science-based diversity, specialization and localized competition', *European Economic Review*, Vol. 43, No. 2, pp.409–429.
- Florida, R. (2002) 'The economic geography of talent', *Annals of the Associations of American Geographers*, Vol. 92, No. 4, pp.743–755.
- Florida, R. (2003) 'Cities and the creative class', *City & Community*, Vol. 2, No. 1, pp.3–19.
- Florida, R. (2005) *Cities and the Creative Class*, Routledge, New York, London.
- Florida, R., Mellander, C. and Stolarick, K. (2008) 'Inside the black box of regional development human capital, the creative class and tolerance', *Journal of Economic Geography*, Vol. 8, No. 5, pp.615–649.
- Glaeser, E.L. (1997) 'Cities and ethic: an essay for Jane Jacobs', Harvard University Discussion Paper, Cambridge, Massachusetts.
- Glaeser, E.L. (2005) 'Review of Richard Florida's the rise of the creative class', *Regional Science and Urban Economics*, Vol. 35, No. 5, pp.593–596.
- Glaeser, E.L. and Saiz, A. (2004) 'The rise of the skilled city', Brookings-Wharton Papers on Urban Affairs, pp.47–105.
- Glaeser, E.L., Kolko, J. and Saiz, A. (2001) 'Consumer city', *Journal of Economic Geography*, Vol. 1, No. 1, pp.27–50.
- Jacobs, J. (1961) *The Death and Life of Great American Cities*, Random House, New York.
- Jacobs, J. (1969) *The Economy of Cities*, Random House, New York, USA.
- Jacobs, J. (1984) *Cities and Wealth of Nations*, Random House, New York.
- Klein, J.L. and Tremblay, D-G. (Eds.) (2010) 'Créativité et cohésion sociale en milieu urbain: pour une ville créative pour tous', in *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, pp.201–221, Presses de l'université du Québec and Presses de l'université de Rennes, Québec/Rennes.
- Klein, J-L., Tremblay, D-G., Fontan, J-M. and Guay, N. (2007) 'The uniqueness of the Montreal for industry in an apparel sector adrift: the role of proximity', *International Journal of Enterprise and Innovation Management*, Vol. 7, Nos. 2/3/4/5, pp.298–318.
- Levine, M. (2010) 'La classe créative et la prospérité urbaine: mythes et réalités', in Tremblay, R. and Tremblay, D-G. (Eds.): *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, pp.87–134, Presses de l'université du Québec and Presses de l'université de Rennes, Québec/Rennes.
- Manning, T.J. and Darnton, J. (2006) 'Social diversity and economic development in the metropolis', *Journal of Planning Literature*, Vol. 21, No. 2, pp.153–168.
- Markusen, A. (1996) 'Sticky places in slippery space: a typology of industrial districts', *Economic Geography*, Vol. 72, No. 3, pp.293–313.
- Markusen, A. and Schrock, G. (2006) 'The artistic dividend: urban specialization and economic development implications', *Urban Studies*, Vol. 43, No. 10, pp.1661–1686.
- Marlet, G. and Van Woerkens, C. (2004) *Skills and Creativity in a Cross-section of Dutch Cities*, Universiteit Utrecht, Utrecht School of Economics, Tjalling C Koopmans Research Institute, Discussion Paper Series No: 04-29.
- National Science Board (2004) *Science and Engineering Indicators 2004*, Vol. 1, NSB 04-1, Arlington, National Science Foundation.
- Peck, J. (2005) 'Struggling with the creative class', *International Journal of Urban and Regional Research*, Vol. 24, No. 4, pp.740–770.

- Peck, J. (2009) 'The cult of urban creativity', in Keil, R. and Mahon, R. (Eds.): *Leviathan Undone: the Political Economy of Scale*, pp.77–102, University of British Columbia Press, Vancouver.
- Pilati, T. and Tremblay, D-G. (2008) 'Le développement socio-économique de Montréal: la cite créative et la carrière artistique comme facteurs d'attraction?', *Canadian Journal of Regional Science*, Vol. 30, No. 3, pp.475–495.
- Pilati, T. and Tremblay, D-G. (2010) 'Cité créative et district culturel; de nouvelles initiatives de développement local?', in Tremblay, R. and Tremblay, D-G. (Eds.): *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, pp.135–177, Presses de l'Université du Québec and Presses de l'Université de Rennes, Québec/Rennes.
- Piore, M.J. and Sabel, C.F. (1984) *The Second Industrial Divide: Possibilities for Prosperity*, Basic Books, New York.
- Polèse, M., Shearmur, R. and Chenard, P. (2005) *La Production, l'attraction et la Rétention des Diplômés Universitaires. Étude Comparative de la Région Métropolitaine de Montréal et d'autres Métropoles Canadiennes et Américaines*, Institut National de la Recherche Scientifique, Montréal.
- Porter, M. (1990) *The Competitive Advantage of Nations*, Macmillan: London.
- Rantisi, N. (2009) *Montreal: The Small, Big City: Theme II Report on The Social Foundations of Talent Attraction and Retention*, Research report for the ISRN project 2009.
- Rantisi, N. and Leslie, D. (2008) 'The social and material foundations of creativity in Montreal', *Paper Presented at the Annual Meeting of the Innovation System Research Network*, 30 April–2 May, Montreal, Quebec.
- Rausch, S. and Negrey, C. (2006) 'Does the creative engine run? A consideration of the effect of creative class on economic strength and growth', *Journal of Urban Affairs*, Vol. 28, No. 5, pp.473–489.
- Romer, P.M. (1986) 'Increasing returns and long-run growth', *Journal of Political Economy*, University of Chicago Press, Vol. 94, No. 5, pp.1002–1037.
- Roy-Valex, M. (2010) 'Arts, territoires et «nouvelle économie»: Quelles perspectives ouvertes par la théorie du capital créatif?', in Tremblay, R. and Tremblay, D-G. (Eds.): *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, pp.37–86, Presses de l'université du Québec and Presses de l'université de Rennes, Québec/Rennes.
- Salais, R. and Storper, M. (1993) *Les Mondes de Production*, Éditions de l'EHESS, Paris.
- Shapiro, J.M (2003) *Smart Cities: Explaining the Relationship between City Growth and Human Capital*, Unpublished manuscript.
- Shearmur, R. (2006) 'L'aristocratie du savoir et son tapis rouge. Quelques réflexions sur les thèses de Richard Florida', in Tremblay, D-G. and Tremblay, R. (Eds.): *La Compétitivité Urbaine à l'ère de la Nouvelle Économie: Enjeux et Défis*, pp.113–134, Presses de l'Université du Québec, Québec.
- Shearmur, R. (2010) 'L'aristocratie du savoir. Quelques réflexions sur les thèses de Richard Florida', in Tremblay, R. and Tremblay, D-G. (Eds.): *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, Presses de l'Université du Québec and Presses de l'Université de Rennes, Québec/Rennes.
- Simon, C.J. (1998) 'Human capital and metropolitan employment growth', *Journal of Urban Economics*, Vol. 43, No. 2, pp.223–243.
- Smith, D., Cutting, J.C. and Riggs, R.O. (1991) 'Use of students as research subjects', *Research Management Review*, Vol. 5, No. 1, pp.23–34.
- Storper, M. and Scott, A. (1989) 'The geographical foundations and social regulation of flexible production complexes', in Dear, M. and Wolch, J. (Eds.): *The Power of Geography*, pp.21–40, Unwin Hyman, Boston.
- Thomas, J.M. and Darnton, J. (2006) *Journal of Planning Literature*, November, Vol. 21, No. 2, pp.153–168.
- Tremblay, R. and Tremblay, D-G. (2009) *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, Presses de l'Université du Québec and Presses de l'Université de Rennes, Québec/Rennes.

Vivant, E. (2010) 'Vers un urbanisme créatif?', in Tremblay, R. and Tremblay, D-G. (Eds.): *La Classe Créative Selon Richard Florida: Un Paradigme Urbain Plausible?*, pp.161–177, Presses de l'université du Québec and Presses de l'université de Rennes, Québec/Rennes.

### Interviews

- Interview 1 Student, computer science program (UQÀM), September 7th, 2007
- Interview 2 Student, electrical engineering program (ETS), September 11th, 2007.
- Interview 3 Student, biochemistry program (UQÀM), September 12th, 2007.
- Interview 4 Student, biology program (UQÀM), September 25th, 2007.
- Interview 5 Student, computer science program (UQÀM), November 9th, 2007.
- Interview 6 Student, biochemistry program (UQÀM), November 16th, 2007.
- Interview 7 Student, mechanical engineering program (ETS), November 29th, 2007.
- Interview 8 Graduate student in engineering working in Montreal, December 5th, 2007.
- Interview 9 Student, biology program (UQÀM), January 30th, 2008.

### Notes

- 1 Bohemians are defined as follows: writers, creative and performing artists, photographers, artistic, entertainment and sports associate professionals, fashion and other models.
- 2 This acronym includes the following sectors: technology and innovation, arts and culture, professionals and management, education.
- 3 See a summary of comments in Darchen and Tremblay (2008), and a series of articles on the creative class thesis, with some comments in Tremblay and Tremblay (2009).
- 4 Measured by using gross metropolitan product (GMP) per capita.
- 5 See Darchen and Tremblay (2010a).
- 6 Québec students are those from the province of Québec, outside Montréal.
- 7 Here, we do not differentiate according to the origin.
- 8 We did try with the professional order of engineers, but they did not want to engage in such research.

## **Appendix**

### *Questionnaire*

#### *I Preliminary questions*

- 1 Where are you born?: (Name of the city:     )
  - a If you are born outside Montreal, when did you first settled in Montreal?  
(Date of arrival:     )
  - b Age and matrimonial status (Age:     ; Matrimonial status:     ).
- 2 What is your ethnic origin?
- 3 Can you present your academic background by mentioning your highest diploma  
(Institution:     ; Program:     ; Place:     ; Year:     ).
- 4 What is your future plan of career?

#### *II Attraction/retention*

- 1 What were the criteria influencing you choice to study in this city? Please rank the following criteria according to level of importance: the quality of programs/university in science and technology, the quality of life, the level of tolerance.
- 2 What are the criteria influencing your choice to *stay in this city* once you have graduated? Please rank the following criteria according to level of importance: quality of work, lifestyle, cost of living, quality of life, social network.
- 3 What would be the criteria influencing your choice to *come and live* in this city (Montreal) once you graduate? Please rank the following criteria according to level of importance: quality of work, openness to creativity, level of salary, level of tolerance.
- 4 What are the criteria influencing the attractiveness of the city (Montreal)? Please rank the following criteria according to level of importance: quality of the urban and natural environment, cultural activities, variety of restaurants, ethnic diversity, security.
- 5 What are the factors intervening the decision to stay in a city (Montreal) once graduated? Please rank the following criteria according to level of importance: level of salary, quality of work, level of tolerance, authenticity of the urban milieu.
- 6 Would you still stay in Montreal if you received better career opportunity elsewhere, choose one of the following answers: Yes, Likely, Not likely, No.
- 7 Where would you leave once you have graduated? Choose one of the following answers: a city in Quebec, a city in Canada, a city in Europe, a city in the USA.
- 8 What would be the most important criteria if you were to leave Montreal? Please rank the following criteria according to level of importance: level of salary, quality of work, quality of life, level of tolerance.