

**EFFECTS OF MIGRATION SELECTIVITY ON THE POPULATION
OF
THE ATLANTIC REGION**

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ABSTRACT

The effects of migration selectivity on the population of the Atlantic region are determined by creating six net migration schedules for six personal variables: age, sex, nativity, education status, mother tongue and marital status. Although the migration schedules were rather complex, selectivity was greatest for young adults and the well educated. The population of the Atlantic region is selective with respect to age and education status. The Atlantic region is losing its young and well educated individuals through the migration process. Furthermore, the Atlantic region had a net inflow of elderly individuals. The effect of the migration selectivity is the loss of young adults, which is interpreted as an important loss of human capital compounding the economic problems of the region. While the increase in elderly population will economically burden the local social and health systems. Using the argument that the migration process is severely hurting the region economically, the Atlantic governments can argue for larger equalization payments to the region.

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1. INTRODUCTION

The purpose of this paper is to describe the effects of migration selectivity on the population of the Atlantic region. The two main objectives of the paper is to identify the selectivity of the migrants and to then study the effects of the selectivity. The research on selectivity will be directed at six personal factors: age, sex, mother tongue, place of birth, marital status, and education. After clearly establishing the selectivity of the migrants, the effects of the selectivity will be determined by relating the migration process to larger social and political issues.

According to Burrill and McKay (1987) there has been a tragic period of underdevelopment in the Atlantic Provinces. There are numerous reasons for this underdevelopment. There is high unemployment and underemployment. In addition, there is a dependency on capital from outside sources for development, therefore a dependency on decisions from outsiders on how the resources of the area are to be distributed (Burrill and McKay, 1987, p.193). During the long period of underdevelopment, from the end of World War II to the present, outmigration to other parts of Canada has become a problem for the Atlantic provinces. The Atlantic region had a net loss of 400,000 people in the sixty year period between 1921 and 1981 (Atlantic Provinces Economic Council, 1987).

This tended to take the best and most innovative individuals from the region, as they were forced to move because of generally poor economic conditions in the region in the last sixty years (APEC, 1987).

A study on the effects of migration selectivity will give the Atlantic governments a view of the migration flows. Migration selectivity is the difference in migration behaviour with respect to selected personal attributes (ie. age, sex, mother tongue, education, income, and nativity). It is important for the Atlantic provinces to investigate the type of people they are losing, and what the type of immigrants they are receiving. For example, the provincial governments may be concerned with the level of education of the migrants. The outmigration of highly educated workers will only add to the problem of underdevelopment. Conversely, the governments will be concerned with the level of education of immigrants. For example, an influx of poorly educated immigrants with children will burden the education system.

The Atlantic provinces may have to develop incentives to attract and keep highly educated migrants. Moreover, the government may find that too many of their young people are leaving and will have to develop new policies to try to provide more incentive for their youth to stay. By keeping the young and well educated in the region, the provinces will

have a chance to direct their own future. Development must come from within the Atlantic region so decisions on the future will be in the hands of people.

2. LITERATURE REVIEW

The role of migration in the redistribution of population has been well documented, ranging from simple descriptive approaches describing migration rates to more complex behavioural models explaining the nature of migration flows. The volume of literature on migration that has been generated in the last hundred years is immense. This review will look at a few selected papers that are most relevant to the study.

Arguably the first migration paper published is Ravenstein's "The Laws of Migration" in 1885 and 1889. Ravenstein's general laws of migration simply describe certain migration flows. His laws have lessened in strength with the increased mobility that society has received from technology. Lee (1966) furthers Ravenstein's work by updating Ravenstein's Laws. Lee generalizes migration into an origin-destination system. The origin and destination system is a push pull exercise with each area having positive and negative forces. In between the origin and destination is a set of obstacles that can only be overcome by a combination of the net forces of the origin and destination. Lee states in his theory that the migrant is highly selective; migration does not take place randomly. The results of this study will be an example of the

push-pull exercise that Lee has described in his 'Theory of Migration' (Lee, 1966).

Existing studies have described and proven the migrants to be highly selective with respect to certain personal attributes. Liaw (1988) creates several migration and mobility schedules for several personal attributes. He showed that couples with children are less likely to migrate than couples without children. In addition, he found that the well educated are more likely to migrate than the worst educated. Furthermore, Liaw shows that English speakers are more likely to migrate than French speaking individuals. Using the findings of Liaw as a guide, this study will try to identify the migration selectivity of the population of the Atlantic region.

A more sophisticated look at the importance of personal factors on migration selectivity can be found in a multivariate scheme like the nested logit model. Liaw and Ledent (1988) use the nested logit model to try to explain the joint effects of ecological and personal factors on the elderly interprovincial migration. The complicated nested logit model tries to explain the motivations of migration for the elderly. This study will not try to explain the selectivity, but only identify the selectivity and try to show its effects on the Atlantic region.

To appreciate the effects of migration selectivity a look at the economic conditions of the whole region should be carried out. Burrill and McKay (1987) give critical perspectives on underdevelopment and primary industries in the Atlantic region. They say that there is a chronic problem of underdevelopment in the Atlantic region. According to Burrill and McKay underdevelopment is associated with a dependency on capital from outside sources and therefore a dependency on decisions from outsiders. Furthermore, Gauthier (1980) in his examination of some economic aspects of migration for Newfoundland found that many non-native migrants (i.e. those not born in Newfoundland) migrating to Newfoundland already had jobs before migration. This can be interpreted that large firms are bringing in non-natives of Newfoundland to help manage firms. Hence, Gauthier's study supports Burrill and McKay's claim that the decisions of the province are in the hands of outsiders.

The importance of migration can be seen in Huntington's (1924) theory of natural selection. Huntington's theory was that: "the key to many of the most puzzling features of distribution of human characteristics is found in natural selection" (Huntington, 1924, p.2). For example, Huntington using America as one example proposed that the key to the success of the U.S. was the natural selection process

of a particularly arduous journey. Whereby, the weak were weeded out through a long journey and only the strong survived. Huntington's theory of natural selection can be used to partly explain the Atlantic regions economic misfortunes in the last sixty years. According to the Atlantic Provinces Economic Council (APEC, 1987), the Atlantic provinces have had a net loss of 400,000 people from 1921 to 1981. In this same time period unemployment has been higher than national averages while wages have been lower than national averages. Huntington would explain the regions economic misfortune on the natural selection process where the best and most innovative individuals left the Atlantic region while the weaker and less talented individuals stayed in the region. Although there are other political and economic factors involved in the problems of the Atlantic region, it would be foolish to ignore Huntington's theory of natural selection.

Migration selectivity has been well documented, but the effects of migration selectivity have not been sufficiently investigated. The migration schedules set up by Liaw (1988) have shown us what to expect when investigating migration selectivity. In addition, the theory of migration by Ravenstein and Lee will be used as a theoretical background to direct this study. Moreover, Burrill and McKay's critical

perspectives on the modern problems of the Atlantic region and Huntington's Theory of Natural Selction will be used to help explain the effects of migration selectivity on the Atlantic region. In conclusion, the existing literature will be used as a guide to direct the research for this study.

3. DESCRIPTION OF DATA AND METHOD OF ANALYSIS

Data for the study will be obtained from the 1981 Public Use Sample (PUS) of the Canadian census. The 1981 Canadian census consists of a long and a short form, with one-fifth of the population filling out the long form. The PUS is made up of ten percent of the long forms giving us a total sample size of more than 400 000 individuals and 102 attributes for each individual. The PUS data is a rich micro data set with individual records being the smallest unit of data. Statistics Canada has chosen the individuals in a rational manner to reflect all the attributes of the population. For example, the PUS data represents all age groups, all education backgrounds, ethnic backgrounds and other personal factors very well.

Due to confidentiality concerns, the PUS data for Prince Edward Island is contained in the fictitious province of PEIT which includes Yukon and the North West Territories. The data for PEI, Yukon and Northwest Territories will have to be excluded from the study because it is impossible to discern which individual data are from PEI exclusively.

The study will look at two geographic study regions. Nova Scotia, New Brunswick and Newfoundland will be aggregated into one study region called the Atlantic Region of Canada

(AROC) while the rest of the Canadian provinces will be aggregated into the other study region.

After the PUS data has been aggregated into the two study regions the migrational status of each individual is determined through the comparison of his/her provinces of residence in 1976 and 1981. Cross tabulation tables for AROC are made for each personal variable showing the following migration categories:

- (1) ASTAY-- Stayers in AROC;
- (2) AOUT--- Outmigrants of AROC;
- (3) ROUT--- Immigrants to AROC;
- (4) ASTAY-- Stayer in the rest of Canada.

The in-, out-, and net migration rates are calculated for each of the personal attributes for every age group using the formulas:

- (1) $OUTRATE = (AOUT/APOP76) * 100$
- (2) $INRATE = (ROUT/APOP76) * 100;$
- (3) $NETRATE = (INRATE - OUTRATE);$

where APOP76 is the population of the Atlantic region in 1976 for a particular personal attribute. Furthermore, the 'true

immigration' rate is calculated for AROC according to:

$$(4) \text{ ROUtrate} = (\text{ROUT} / (\text{ROUT} + \text{RSTAY})) * 100;$$

The variable ROUtrate can be interpreted as the propensity for people living in the rest of Canada to migrate to the Atlantic region.

The outmigration rate was tested for significance by using a proportions test. The lower confidence interval was calculated for the outmigration rates. For each age group, the personal attributes with outmigration rates not significantly different from zero had their out, in and net migration rates deleted, as seen in Appendix 1. The remaining significant data was used to calculate the migration schedules. A detailed list of the calculations can be found in Appendix 1.

According to the definitions used for the personal variables in Liaw's (1988) paper, the net migration schedules are constructed for each of the following attributes:

- (1) Sex: female, male;

(2) Mother Tongue: English, French, "Minority";

(3) Education: high-ed (with degree in 1981), mid-ed (with certificate or diploma in 1981), low-ed (without degree, certificate or diploma in 1981), student (being still a student in 1981);

(4) Marital Status: Married (being married before June 1976 and remaining married in June 1981), Wedded (got married between June 1976 and June 1981), Single (never married by June 1981);

(5) Nativity: Native (province of birth being identical to the province of residence in June 1976), Foreign Born (place of birth being outside of Canada), Non-native (province of birth being different from the province of residence in June 1976) (Liaw, 1988, p.7).

Finally, the ten age intervals used are: 05-09, 10-14, 15-19, 20-24, 25-29, 30-34, 35-44, 45-54, 55-64 and 65 plus. The migration schedules will not be entirely clear because of different age intervals used in the study. Moreover, some of the net migration rates were deleted because

of insignificance compounding the problem of a clear migration schedule.

4. ANALYSIS AND INTERPRETATION OF DATA

Migration Schedule: Net Migration

(Figure 4.1)

The Atlantic provinces experience a particularly large net migration loss from the 20 to 29 age group. However, the Atlantic region receives a small net gain in the 45 plus age groups. Overall, the most significant feature is a large loss of the young adults and a small gain in the elderly age groups.

The effect of a large loss of young adults is that the quality of human capital in the Atlantic region will depreciate. The Atlantic region is losing its leaders of tomorrow and a large part of their economic potential. Timing of the migration is particularly bad because the young adults are just entering the work force becoming economically productive. Thereby, the economic potential of the region declines with the loss of young adults. Furthermore, by leaving at a the young adult age, the migrant returns nothing to the community that educated them. The loss of human capital has been a major reason for the economic problems of the Atlantic region. Finally, the Atlantic region will have to maintain its human resources to

Overall Migration Schedule

AROC: 1976-81

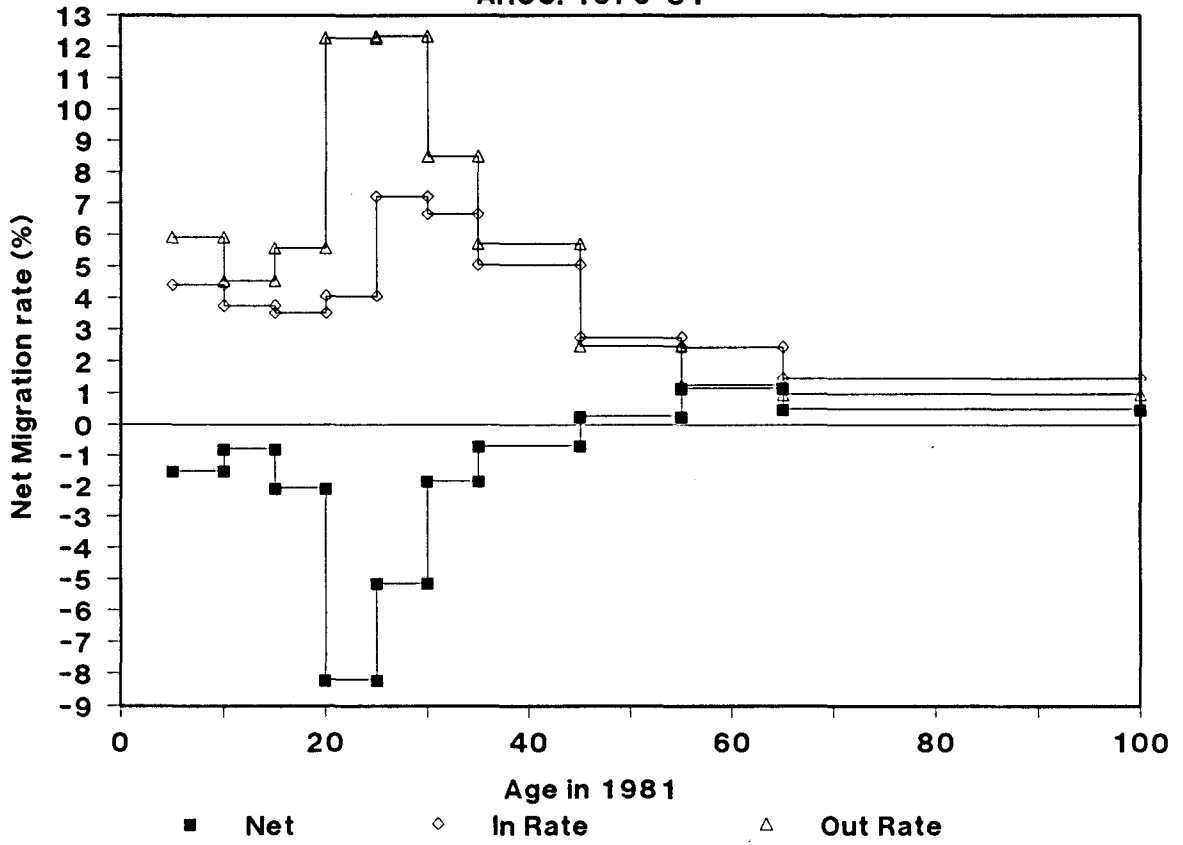


Figure 4.1

be economically successful in the future.

The small increase in a positive net migration rate for the elderly age group will only add to the aging population in the Atlantic region. The increase in the elderly will increase the cost of health and social care for the Atlantic provinces.

At closer look at the other personal factors will help provide a better insight into the selectivity of the migrants. By referring back to the overall migration pattern the effects of the selectivity will be determined.

Migration Schedule by Sex

(Figure 4.2)

The migration selectivity by sex is not very strong. For both sexes, there is roughly a net balance from the 5 to 19 age group, then a significantly large negative net migration rate from the 20 to 34 age group. A near balance is seen in the 35 to 54 age group. Finally, a small net gain is seen in the 55 plus age group. An important difference is that the net loss in the 20 to 34 age interval is greater for males than for females.

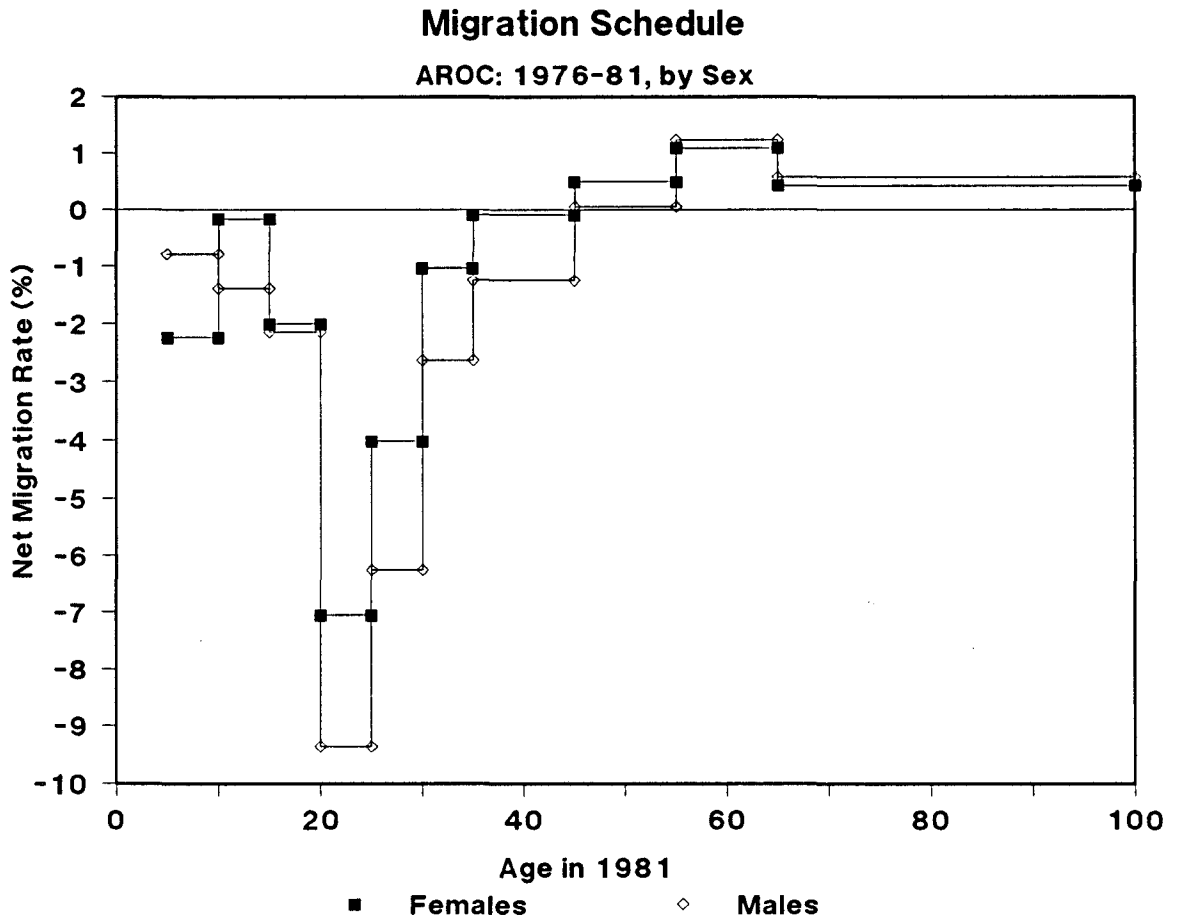


Figure 4.2

Migration Schedule by Nativity

(Figure 4.3)

The selectivity by nativity is rather strong. The major difference in age pattern is between the non-natives on the one hand and the natives and foreign-born on the other. The Atlantic region experiences substantial net gain of the non-natives through all ages beyond the early 20's, whereas it suffers a net loss of the other two groups through practically all ages.

The high net migration of non-natives can be interpreted as a level of dissatisfaction with a previous migration. The non-natives entering AROC are probably dissatisfied migrants returning from a previous migration. By examining the ROUtrate figures in Table 4A for non-natives it can be seen that non-natives living in the rest of Canada have a high probability to migrate to the Atlantic region as compared to natives.

AROC has a very large negative net migration rate for foreign born migrants of the young age group from 5 to 14 age group and the 30 to 44 age group. This suggests that the Atlantic provinces have a poor retaining ability for recent immigrants from other countries.

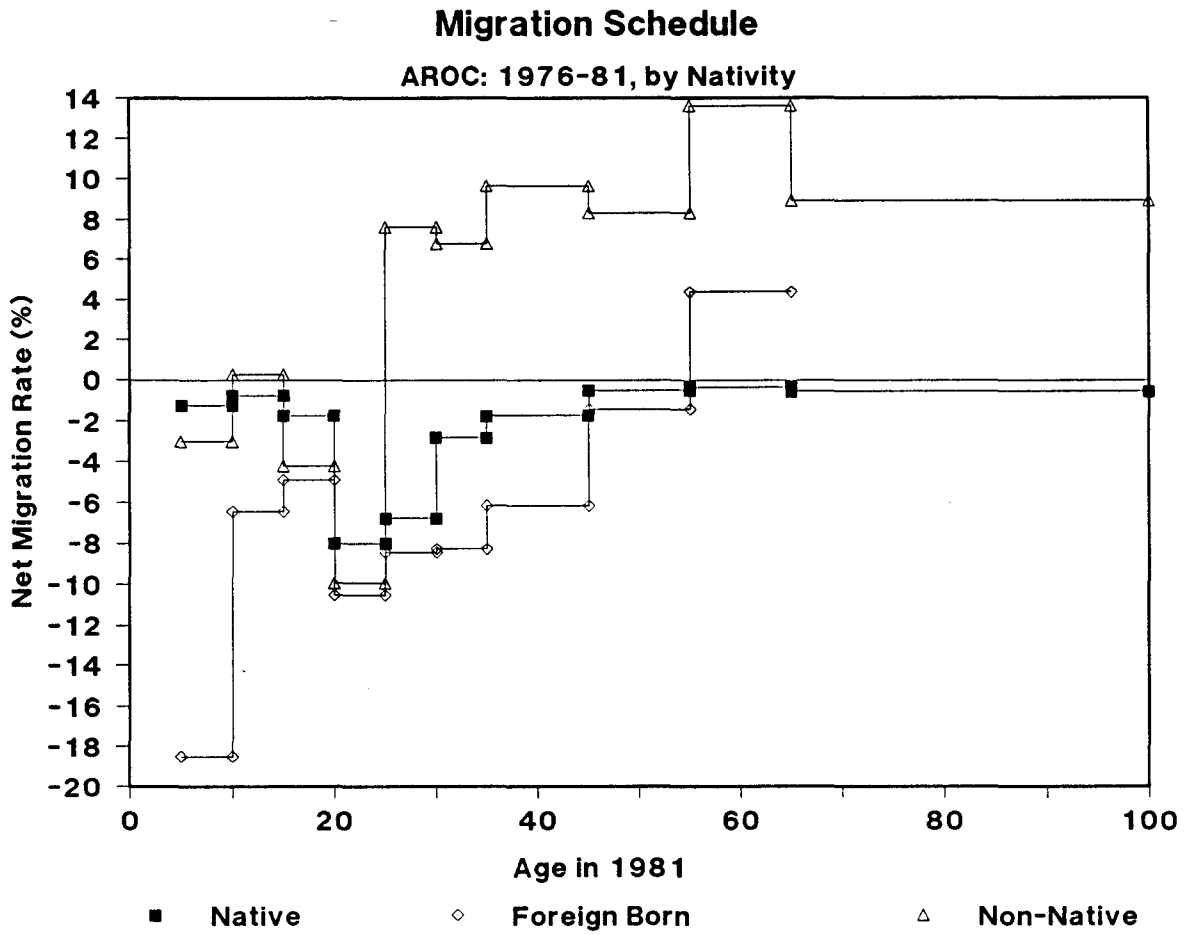


Figure 4.3

TABLE 4A

Calculated Migration Rate for AROC, 1976-81, by Nativity

	AGE	OUTRATE	INRATE	NETRATE	ROURATE
NATIVE	05-09	4.05	2.83	-1.22	0.34
	10-14	2.55	1.78	-0.77	0.21
PROV. OF BIRTH	15-19	3.73	1.98	-1.75	0.23
SAME AS PROV. OF	20-24	10.22	2.23	-7.99	0.24
RESIDENCE IN 1976	25-29	9.17	2.38	-6.79	0.27
	30-34	4.63	1.82	-2.81	0.22
	35-44	2.85	1.13	-1.72	0.14
	45-54	1.02	0.53	-0.49	0.06
	55-64	0.85	0.51	-0.34	0.07
	65+	0.73	0.18	-0.55	0.03
NON-NATIVE	05-09	27.82	24.81	-3.01	4.23
	10-14	19.89	20.16	0.27	3.00
PROV. OF BIRTH	15-19	18.71	14.48	-4.23	1.98
DIFFERENT FROM	20-24	29.06	19.13	-9.93	1.99
PROV. OF RESIDENCE	25-29	32.72	40.32	7.60	3.61
IN 1976	30-34	29.06	35.84	6.78	2.98
	35-44	19.66	29.30	9.64	1.96
	45-54	12.76	21.07	8.31	1.03
	55-64	4.21	17.80	13.59	0.87
	65+	3.96	12.87	8.91	0.71
FOREIGN BORN	05-09	22.22	3.70	-18.52	0.11
	10-14	15.05	8.60	-6.45	0.36
BORN OUTSIDE OF	15-19	17.65	12.74	-4.90	0.41
CANADA	20-24	21.05	10.53	-10.53	0.26
	25-29	28.17	19.72	-8.45	0.31
	30-34	26.32	18.05	-8.27	0.34
	35-44	20.85	14.67	-6.18	0.30
	45-54	7.04	5.63	-1.41	0.11
	55-64	3.28	7.65	4.37	0.15
	65+		**NS**		

Note: **NS** Non-significant data

The effect of AROC having a poor retaining ability for recent immigrants may be that the Atlantic region will lose out on the innovation and entrepreneurial spirit that is often associated with foreign immigrants. Remember that according to Huntington (1924) the migration process is part of a natural selection process whereby the weak are weeded out through a long strenuous journey. Hence, the large net loss of young foreign immigrants is probably another factor in the chronic economic problems in the Atlantic.

Migration Schedule by Education

(Figure 4.4)

The selectivity by education is also strong, particular in the young adult age groups. Generally, the highly educated migrants have a higher negative net migration rate than the other education classes (Liaw 1988). The net migration loss of the best educated is particularly high in the 20 to 24 age group. The high negative net migration rate is probably due to individuals graduating from university in the Atlantic region and migrating to other areas of the country to look for better employment opportunities.

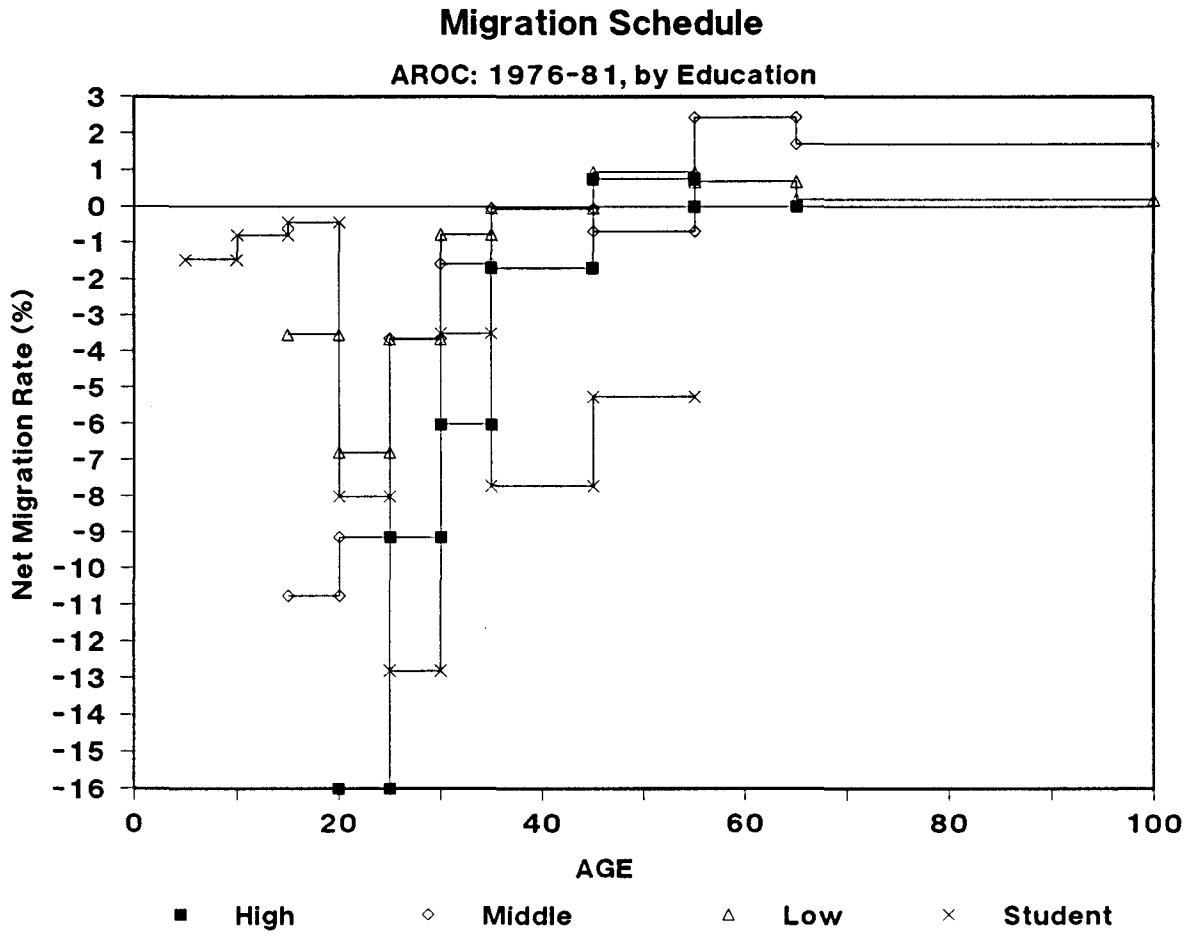


Figure 4.4

The effect of AROC losing its highly educated at a young age is that the Atlantic region is losing one of its most valuable resources -- human capital. The Atlantic region is losing the managers and leaders of the region to migration. The Atlantic region had invested its education of its young adults and sees the young adults leaving at a very high rate. By leaving after they had just graduated the youth of the region are contributing nothing back to the region. Therefore, the Atlantic region is robbed of its educational investment in its youth by the migration process.

Students have a high migration rate for 20 to 54 age group. The reason for the high student rate is probably that people trying to get post-secondary education are going to universities outside of the region.

The net migration schedule of the poorly educated individuals is similar to that of the total population (Figure 4.1): a net loss in young adulthood followed by a net gain in the later stages of the life cycle.

The net migration schedule of the middle educated migrants is similar to that of the poorly educated. However, it appears that the net gain in the elderly age group is somewhat larger for the middle educated group. The positive net migration rate is probably caused by retirees^e being attracted by the Atlantic regions slower pace of life.

Migration Schedule by Mother Tongue

(Figure 4.5)

Selectivity by mother tongue is clearest with respect to minorities. In the 20 to 44 age group people with a minority mother tongue have a very high negative net migration rate. The large loss of minorities is probably due to the Atlantic regions poor retaining ability for foreign immigrants.

With a large negative net rate for the 20 to 29 age groups and a small gain for the 55 plus age groups, people with an English mother tongue have a net migration pattern similar to that of the total population. In contrast, migrants with a French mother tongue experience a greater net balance in the migration schedule.

Migration Schedule by Marital Status

(Figure 4.6)

Selectivity with respect to marital status is very complex. Married individuals have a high negative net migration rate in the 15 to 24 age group and experience a net balance for the 25 plus age groups. By examining Table 4B, the high net loss for the 15 to 24 age group is mainly

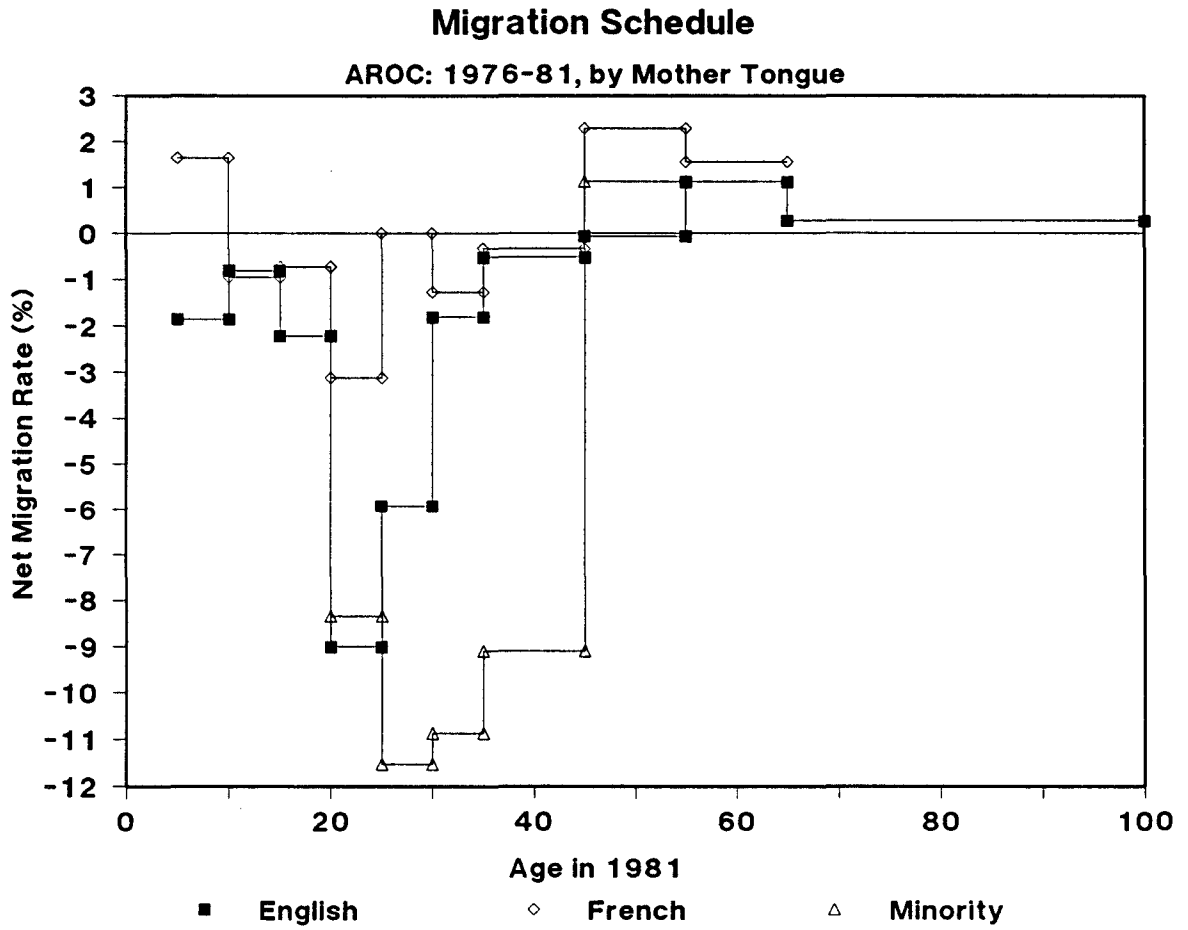


Figure 4.5

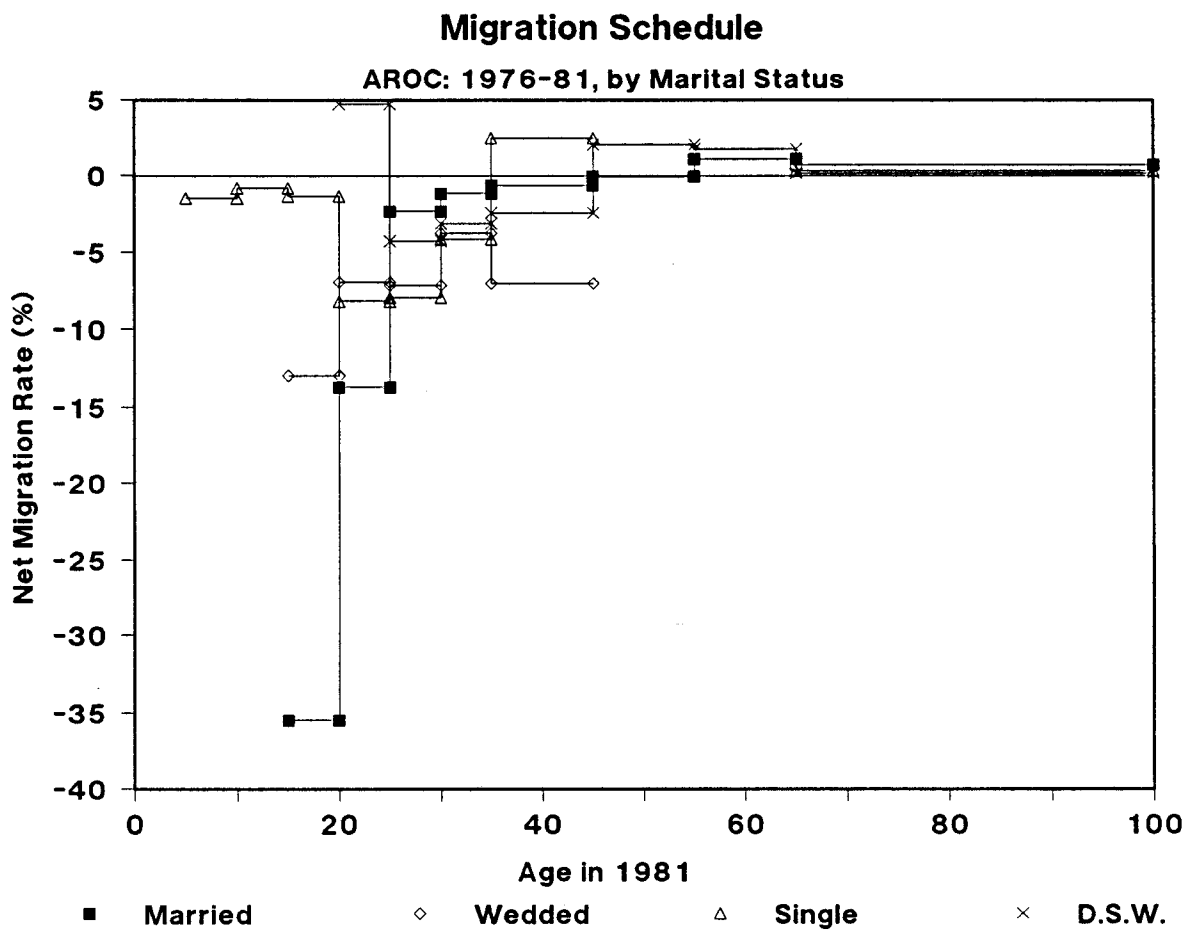


Figure 4.6

TABLE 4B

Calculated Migration Rates for AROC, 1976-81, by Marital Status

	AGE	OUTRATE	INRATE	NETRATE	ROURATE
			NS		
MARRIED	05-09		**NS**		
	10-14		**NS**		
GOT MARRIED	15-19	35.48	0.00	-35.48	0.00
BETWEEN 1976-1981	20-24	19.02	5.34	-13.69	0.50
	25-29	9.26	6.93	-2.33	0.76
	30-34	7.50	6.33	-1.17	0.64
	35-44	5.43	4.79	-0.64	0.44
	45-54	2.56	2.49	-0.07	0.21
	55-64	1.27	2.34	1.07	0.21
	65+	0.70	1.39	0.70	0.14
WEDDED	05-09		**NS**		
	10-14		**NS**		
GOT MARRIED	15-19	17.65	4.71	-12.94	0.55
BETWEEN 1976-1981	20-24	11.72	4.76	-6.97	0.55
	25-29	14.68	7.49	-7.19	0.70
	30-34	13.06	9.28	-3.78	0.75
	35-44	12.94	5.88	-7.06	0.39
	45-54		**NS**		
	55-64		**NS**		
	65+		**NS**		
SINGLE	05-09	5.92	4.44	-1.48	0.53
	10-14	4.56	3.75	-0.81	0.43
NEVER BEEN MARRIED	15-19	4.91	3.54	-1.37	0.39
	20-24	11.50	3.30	-8.21	0.33
	25-29	14.88	6.92	-7.96	0.61
	30-34	9.42	5.26	-4.16	0.43
	35-44	3.96	6.40	2.44	0.53
	45-54		**NS**		
	55-64		**NS**		
	65+	1.54	1.85	0.31	0.19
D.S.W.	05-09		**NS**		
	10-14		**NS**		
BEING DIVORCED,	15-19		**NS**		
SEPRATED OR	20-24	7.81	12.50	4.69	0.91
WIDOWED IN 1981	25-29	13.90	9.63	-4.28	0.85
	30-34	12.22	9.05	-3.17	0.71
	35-44	8.97	6.52	-2.45	0.49
	45-54	2.35	4.40	2.05	0.30
	55-64	1.40	3.15	1.75	0.29
	65+	1.28	1.43	0.15	0.14

Note: **NS** Non-significant data

due to a high outmigration rate rather than a low immigration rate. The high outmigration rates for married young adults is probably due to the fact that people in Atlantic region want to raise their family in an area with better economic opportunities.

Singles and divorced/separated/widowed people have a greater net balance in migration. The effect of migration selectivity is not very strong for singles, divorced/separated/widowed migrants.

Finally, wedded individuals (i.e. become married during the migration period) have a high net negative migration rate for the 15 to 44 age group. Using the results for the wedded individuals, the problems of analyzing the migration data can be highlighted. Looking at the migration schedule by marital status, it seems that the wedded migrants have a high negative net migration rate for the 15 to 44 age group. It suggests that a lot of wedded people are leaving the Atlantic region. The actual numbers of in- and outmigrants for the Atlantic region in Appendix 1 shows that the high negative net rate is due to a very low number of immigrants, rather than a large number of outmigrants. Hence, the high negative net migration rate for wedded individuals should not be interpreted as a large outflow. Rather, it should be interpreted as the regions un-attractiveness for wedded people in the rest of Canada.

5. SUMMARY

With the focus of the study on the net migration rates of the Atlantic region, we have produced and analyzed six migration schedules for six personal factors: age, sex, nativity, education, mother tongue and marital status. The major findings are as follows.

(1) With respect to age, the effect of migration selectivity is strongest for the young adults aged 20 to 29 years old. The young adults have the largest negative net migration rate. Furthermore, the Atlantic region experiences a net migration gain for the 55 plus age group.

(2) Selectivity with respect to sex is relatively small. With males having a slightly greater negative net migration rate.

(3) Selectivity with respect to nativity is rather strong. The large positive net migration rate of the non-natives is probably due to a large number of return migrants who had experienced dissatisfaction with a previous migration. The loss of foreign born migrants shows that the Atlantic region has a poor retaining ability for foreign immigrants.

(4) Selectivity with respect to education is also strong. The Atlantic region experiences a large loss of high and middle educated individuals in the 20 to 29 age group. Conversely, AROC experiences a greater net gain of middle educated individuals in the 45 plus age category. The loss of highly educated young adults can be interpreted as a loss of important human capital.

(5) Selectivity with respect to mother tongue is clearest for minorities. The regions poor retaining ability for minorities is seen in the high net negative migration rate for migrants with a minority mother tongue in the 20 to 44 age group.

(6) Selectivity with respect to marital status is very complex. Married couples in the 15 to 24 age group have the highest negative net migration rate. The high net rate can be seen as the Atlantic regions un-attractiveness to potential immigrants with young children.

The socioeconomic effects of migration selectivity can be considered in three general areas. First, the selectivity with respect to age and education has a serious effect on the quality of human capital in the region. The Atlantic region has lost numerous young adults in the 20 to

29 age group who have high and middle educations. The effect is that the Atlantic region is losing the innovators and leaders of tomorrow to migration. The quality of human capital is severely diluted by the migration process.

The second area is the net gain of population in the 55 plus age group. Speculatively, the net gain in elderly population may be an increasing trend for the future. 'Baby boomers' that migrated from the Atlantic region in the 1950's and 60's would be coming back at retirement age (APEC, 1987). The impact of this flow in the long run is that health and social costs will increase for the region as the natural population ages along with the net gain in elderly migrants. Therefore, the Atlantic region will have to prepare for the increase in elderly migration in the future as baby boomer return to their roots.

A third significant area of selectivity is the net loss of foreign born individuals and people with a minority mother tongue. The effect of the selectivity is that the inability of the Atlantic region to retain or attract foreign immigrants is a factor in the regions underdevelopment. The productivity and innovation that is associated with immigrants is lost on the Atlantic region. Assuming that the region cannot retain its own youth, the Atlantic governments have to attract creative and innovative immigrants to replace their

youth. The region needs the productivity of immigrants for the region to grow in the future.

6. CONCLUSION

The study has shown that the Atlantic region is losing its human capital and gaining an older population while not retaining foreign immigrants. The loss of young adults and the net gain in elderly can be used by the Atlantic government to argue for larger transfer payments to the region. The Atlantic governments can use the argument that the migration process is a major cause in the region's economic problems. With appropriate funds the Atlantic governments can create incentive programs to keep their youth in the region and maintain effective health care for the elderly.

While the study has had some interesting results further study can lead to a clearer picture of the migration flows. For example, selectivity with respect to income and employment status can still be researched. Research on income will show whether the region is losing its rich or poor. An outflow of high income individuals can be interpreted as an outflow of financial capital adding to the problem of underdevelopment in the region. While research on employment status will show which type of professions are leaving the area. An outflow of highly skilled professions can be considered as a leadership drain compounding the problem of underdevelopment.

Therefore, as a conclusion, migration selectivity of the population of the Atlantic region has been found to be fairly complex. The clearest selectivity shows that the region is losing its young adults, particularly those with the best education, and gaining an elderly population. The main effect of the selectivity is an economic loss of the young adults potential and the economic burden of an increase in elderly population. Future research can be directed to other personal factors to get a clearer picture of the migration flows. Finally, the Atlantic region now has a better chance to combat their economic problems by knowing how their human capital is being re-distributed by the migration process.

References

- Atlantic Provinces Economic Council. 1987. Atlantic Canada Today. Formac. Halifax.
- Burrill, G. and I. McKay. 1987. People, Resources, and Power: Critical perspectives on underdevelopment and primary industries in the Atlantic region. Gorsebrook Research Institute. Halifax.
- Davanzo, J.S. 1978. Does unemployment affect migration? - evidence from micro data , Review of Economics and Statistics. 60(4):504-514.
- Gauthier, D. 1980. Some economic aspects of internal migrations: Newfoundland's case, Economic Council of Canada. Discussion Paper No.178.
- Huntington, E. 1924. Geography and natural selection, Annals of the Association of American Geographers. 15:1-16.
- Lee, E.S. 1966. A theory of migration, Demography. 3:47-57.
- Liaw, K.L. 1988. Joint effects of personal and ecological factors on the interprovincial pattern of young adults in Canada. McMaster University. QSEP #236.
- Liaw, K.L. 1988. Mobility and migration schedules of the Canadian population by selected personal factors. McMaster University. QSEP #237.
- Liaw, K.L. and J. Ledent. 1988. Joint effects of ecological and personal factors on elderly interprovincial migration in Canada, Journal of Canadian Regional Science Association, 11:77-100.
- Stone, L.O. 1974. What we know about migration within Canada- A selective review and agenda for future research, International Migration Review. 8(26):267-281.
- Zelinsky, W. 1971. The hypothesis of the mobility transition, Geographic Review, 61:219-249.

Appendix 1

	OBS	AGE	OBS	ASTAY	AOUT	ROUT	RSTAY	APOP76	OUTRATE	INRATE	NETRATE	ROURATE	S	ERROR	LCI
EDUCATION--HIGH	1	05-09	1												
	1	10-14	1												
CLASS 1	1	15-19	1	2	0	1	8	2				11.111	0	0	0
	1	20-24	1	99	26	6	921	125	20.8	4.8	-16	0.647	3.63	7.9866	12.813
WITH UNIVERSITY	1	25-29	1	281	80	47	3497	361	22.161	13.019	-9.141	1.326	2.186	4.8091	17.352
DEGREE IN 1981	1	30-34	1	281	51	31	4225	332	15.361	9.337	-6.024	0.728	1.979	4.3536	11.008
	1	35-44	1	320	32	26	5047	352	9.091	7.386	-1.704	0.513	1.532	3.371	5.72
	1	45-54	1	127	7	8	2787	134	5.224	5.97	0.746	0.286	1.922	4.22879	0.995
	1	55-64	1	106	4	9	1928	110				0.465	1.785	3.9266	-0.29
	1	65+	1	73	3	5	1285	76				0.388	2.234	4.914	-0.967
EDUCATION--MEDIUM	2	05-09	2												
	2	10-14	2												
CLASS 2	2	15-19	2	301	52	14	3791	353	14.731	3.966	-10.765	0.368	1.886	4.15	10.581
	2	20-24	2	1390	218	71	16000	1608	13.557	4.415	-9.142	0.442	0.854	1.8781	11.679
WITH CERTIFICATE	2	25-29	2	1363	171	115	17222	1534	11.147	7.497	-3.651	0.663	0.804	1.7678	9.38
OR DIPLOMA	2	30-34	2	1252	120	98	15944	1372	8.746	7.143	-1.603	0.611	0.763	1.678	7.068
IN 1981	2	35-44	2	1552	98	97	20869	1650	5.939	5.879	-0.061	0.463	0.582	1.28014	4.659
	2	45-54	2	975	38	31	14886	1013	3.751	3.06	-0.691	0.208	0.597	1.31342	2.438
	2	55-64	2	733	11	29	11102	744	1.478	3.898	2.419	0.261	0.442	0.97344	0.505
	2	65+	2	636	6	17	7959	642	0.935	2.648	1.713	0.213	0.38	0.835	0.099
EDUCATION--LOW	3	05-09	3												
	3	10-14	3												
CLASS 3	3	15-19	3	1085	75	34	8568	1160	6.465	2.931	-3.534	0.395	0.722	1.5885	4.877
	3	20-24	3	1406	170	63	12375	1576	10.787	3.997	-6.789	0.507	0.781	1.7191	9.068
WITHOUT DEGREE,	3	25-29	3	1270	124	73	10597	1394	8.895	5.237	-3.659	0.684	0.762	1.6774	7.218
CERTIFICATE OR	3	30-34	3	1318	73	62	10573	1391	5.248	4.457	-0.791	0.583	0.598	1.3154	3.933
DIPLOMA IN	3	35-44	3	2279	92	91	21368	2371	3.88	3.838	-0.042	0.424	0.397	0.87255	3.008
1981	3	45-54	3	2303	34	56	24756	2337	1.455	2.396	0.941	0.226	0.248	0.54491	0.91
	3	55-64	3	2507	28	45	24396	2535	1.105	1.775	0.671	0.184	0.208	0.45668	0.648
	3	65+	3	3039	27	33	29119	3066	0.881	1.076	0.196	0.113	0.169	0.371	0.509
EDUCATION--STUDENT	4	05-09	4	3432	216	162	30300	3648	5.921	4.441	-1.48	0.532	0.391	0.8597	5.061
	4	10-14	4	3665	175	144	32982	3840	4.557	3.75	-0.807	0.435	0.337	0.74043	3.817
CLASS 4	4	15-19	4	2752	118	105	27597	2870	4.111	3.658	-0.453	0.379	0.371	0.8154	3.296
	4	20-24	4	752	97	29	11188	849	11.425	3.416	-8.009	0.259	1.092	2.4019	9.023
STILL A STUDENT	4	25-29	4	291	76	29	5780	367	20.708	7.902	-12.807	0.499	2.115	4.6535	16.055
IN 1981	4	30-34	4	216	41	32	4271	257	15.953	12.451	-3.502	0.744	2.284	5.0251	10.928
	4	35-44	4	264	47	23	4686	311	15.112	7.395	-7.717	0.488	2.031	4.4682	10.644
	4	45-54	4	104	10	4	2157	114	8.772	3.509	-5.263	0.185	2.649	5.82884	2.943
	4	55-64	4	39	1	1	840	40				0.119	2.469	5.43081	-2.931
	4	65+	4	22	1	1	365	23				0.273	4.252	9.355	-5.007

	OBS	AGE	OBS	ASTAY	AOUT	ROUT	RSTAY	APOP76	OUTRATE	INRATE	NETRATE	ROURATE	S	ERROR	LCI

MARITAL STATUS	5	05-09	1												
	5	10-14	1												
CLASS 1	5	15-19	1	40	22	0	853	62	35.484	0	-35.484	0	6.077	13.3683	22.116
	5	20-24	1	349	82	23	4618	431	19.025	5.336	-13.689	0.496	1.891	4.1594	14.866
MARRIED--	5	25-29	1	1440	147	110	14415	1587	9.263	6.931	-2.331	0.757	0.728	1.601	7.662
	5	30-34	1	2293	186	157	24256	2479	7.503	6.333	-1.17	0.643	0.529	1.164	6.339
GOT MARRIED	5	35-44	1	3691	212	187	41892	3903	5.432	4.791	-0.64	0.444	0.363	0.79811	4.634
BETWEEN 1976-1981	5	45-54	1	2931	77	75	36343	3008	2.56	2.493	-0.066	0.206	0.288	0.63352	1.926
	5	55-64	1	2572	33	61	29280	2605	1.267	2.342	1.075	0.208	0.219	0.48206	0.785
	5	65+	1	2138	15	30	21742	2153	0.697	1.393	0.697	0.138	0.179	0.394	0.302

MARITAL STATUS	6	05-09	2												
	6	10-14	2												
CLASS 2	6	15-19	2	70	15	4	730	85	17.647	4.706	-12.941	0.545	4.135	9.0968	8.55
	6	20-24	2	1039	138	56	10201	1177	11.725	4.758	-6.967	0.546	0.938	2.063	9.662
WEDDED--	6	25-29	2	866	149	76	10797	1015	14.68	7.488	-7.192	0.699	1.111	2.4439	12.236
	6	30-34	2	253	38	27	3560	291	13.058	9.278	-3.78	0.753	1.975	4.3455	8.713
GOT MARRIED	6	35-44	2	74	11	5	1279	85	12.941	5.882	-7.059	0.389	3.641	8.00953	4.932
BETWEEN 1976-1981	6	45-54	2	18	0	3	295	18				1.007	0	0	0
	6	55-64	2	11	0	0	128	11				0	0	0	0
	6	65+	2	5	0	1	67	5				1.471	0	0	0

MARITAL STATUS	7	05-09	3	3432	216	162	30300	3648	5.921	4.441	-1.48	0.532	0.391	0.8597	5.061
	7	10-14	3	3665	175	144	32982	3840	4.557	3.75	-0.807	0.435	0.337	0.74043	3.817
CLASS 3	7	15-19	3	4027	208	150	38321	4235	4.911	3.542	-1.37	0.39	0.332	0.7306	4.181
	7	20-24	3	2200	286	82	24794	2486	11.504	3.298	-8.206	0.33	0.64	1.4079	10.097
SINGLE--	7	25-29	3	738	129	60	9774	867	14.879	6.92	-7.958	0.61	1.209	2.659	12.22
	7	30-34	3	327	34	19	4409	361	9.418	5.263	-4.155	0.429	1.537	3.382	6.036
NEVER BEEN MARRIED	7	35-44	3	315	13	21	3950	328	3.963	6.402	2.439	0.529	1.077	2.36994	1.593
	7	45-54	3	227	4	6	2922	231				0.205	0.858	1.8882	-0.157
	7	55-64	3	238	3	5	2645	241				0.189	0.714	1.57125	-0.326
	7	65+	3	319	5	6	3214	324	1.543	1.852	0.309	0.186	0.685	1.507	0.037

MARITAL STATUS	8	05-09	4												
	8	10-14	4												
CLASS 4	8	15-19	4	3	0	0	60	3				0	0	0	0
	8	20-24	4	59	5	8	871	64	7.813	12.5	4.688	0.91	3.355	7.3801	0.432
DIV/WID.--	8	25-29	4	161	26	18	2110	187	13.904	9.626	-4.278	0.846	2.53	5.5662	8.337
	8	30-34	4	194	27	20	2788	221	12.217	9.05	-3.167	0.712	2.203	4.8464	7.371
BEING DIVORCED, SEPRATED OR	8	35-44	4	335	33	24	4849	368	8.967	6.522	-2.446	0.493	1.489	3.27665	5.691
	8	45-54	4	333	8	15	5026	341	2.346	4.399	2.053	0.298	0.82	1.80326	0.543
WIDOWED IN 1981	8	55-64	4	564	8	18	6213	572	1.399	3.147	1.748	0.289	0.491	1.08022	0.318
	8	65+	4	1308	17	19	13705	1325	1.283	1.434	0.151	0.138	0.309	0.68	0.603

	OBS	AGE	OBS	ASTAY	AOUT	ROUT	RSTAY	APOP76	OUTRATE	INRATE	NETRATE	ROURATE	S	ERROR	LCI
MOTHER TONGUE	9	05-09	1	3003	199	140	20187	3202	6.215	4.372	-1.843	0.689	0.427	0.9386	5.276
	9	10-14	1	3219	158	131	21815	3377	4.679	3.879	-0.8	0.597	0.363	0.79949	3.879
CLASS 1	9	15-19	1	3577	220	136	25590	3797	5.794	3.582	-2.212	0.529	0.379	0.8341	4.96
	9	20-24	1	3128	449	127	25173	3577	12.552	3.55	-9.002	0.502	0.554	1.2187	11.334
ENGLISH	9	25-29	1	2719	386	202	22393	3105	12.432	6.506	-5.926	0.894	0.592	1.3027	11.129
	9	30-34	1	2593	237	186	20286	2830	8.375	6.572	-1.802	0.909	0.521	1.1456	7.229
	9	35-44	1	3769	220	199	27651	3989	5.515	4.989	-0.526	0.715	0.361	0.79516	4.72
	9	45-54	1	2960	71	69	22062	3031	2.342	2.276	-0.066	0.312	0.275	0.60439	1.738
	9	55-64	1	2879	35	68	20657	2914	1.201	2.334	1.132	0.328	0.202	0.44396	0.757
	9	65+	1	3233	31	40	21398	3264	0.95	1.225	0.276	0.187	0.17	0.373	0.576

MOTHER TONGUE	10	05-09	2	410	15	22	8054	425	3.529	5.176	1.647	0.272	0.895	1.9691	1.56
	10	10-14	2	408	17	13	8602	425	4	3.059	-0.941	0.151	0.951	2.09119	1.909
	10	15-19	2	532	21	17	11302	553	3.797	3.074	-0.723	0.15	0.813	1.7881	2.009
CLASS 2	10	20-24	2	491	54	37	12104	545	9.908	6.789	-3.119	0.305	1.28	2.8156	7.093
	10	25-29	2	469	56	56	10935	525	10.667	10.667	0	0.51	1.347	2.9639	7.703
FRENCH	10	30-34	2	442	34	28	10073	476	7.143	5.882	-1.261	0.277	1.18	2.597	4.546
	10	35-44	2	567	29	27	15271	596	4.866	4.53	-0.336	0.176	0.881	1.93885	2.927
	10	45-54	2	466	13	24	12522	479	2.714	5.01	2.296	0.191	0.742	1.63337	1.081
	10	55-64	2	444	6	13	9971	450	1.333	2.889	1.556	0.13	0.541	1.18952	0.144
	10	65+	2	473	4	11	9123	477				0.12	0.418	0.919	-0.08

MOTHER TONGUE	11	05-09	3	19	2	0	2059	21				0	6.406	14.0924	-4.569
	11	10-14	3	38	0	0	2565	38				0	0	0	0
CLASS 3	11	15-19	3	31	4	1	3072	35				0.033	5.378	11.8313	-0.403
	11	20-24	3	28	8	5	3207	36	22.222	13.889	-8.333	0.156	6.929	15.2438	6.978
"MINORITY"	11	25-29	3	17	9	6	3768	26	34.615	23.077	-11.538	0.159	9.33	20.5262	14.089
	11	30-34	3	32	14	9	4654	46	30.435	19.565	-10.87	0.193	6.784	14.9254	15.509
	11	35-44	3	79	20	11	9048	99	20.202	11.111	-9.091	0.121	4.035	8.87766	11.324
	11	45-54	3	83	5	6	10002	88	5.682	6.818	1.136	0.06	2.468	5.42904	0.253
	11	55-64	3	62	3	3	7638	65				0.039	2.602	5.72544	-1.11
	11	65+	3	64	2	5	8207	66				0.061	2.11	4.642	-1.612

	OBS	AGE	OBS	ASTAY	AOUT	ROUT	RSTAY	APOP76	OUTRATE	INRATE	NETRATE	ROURATE	S	ERROR	LCI
NATIVITY	12	05-09	1	3219	136	95	27932	3355	4.054	2.832	-1.222	0.339	0.34	0.7491	3.305
	12	10-14	1	3284	86	60	28317	3370	2.552	1.78	-0.771	0.211	0.272	0.59762	1.954
CLASS 1	12	15-19	1	3691	143	76	33602	3834	3.73	1.982	-1.747	0.226	0.306	0.6733	3.057
	12	20-24	1	3294	375	82	33516	3669	10.221	2.235	-7.986	0.244	0.5	1.1002	9.121
NATIVE--	12	25-29	1	2862	289	75	27923	3151	9.172	2.38	-6.791	0.268	0.514	1.1312	8.041
	12	30-34	1	2676	130	51	23225	2806	4.633	1.817	-2.815	0.219	0.397	0.873	3.76
PROV. OF BIRTH	12	35-44	1	3785	111	44	31737	3896	2.849	1.129	-1.72	0.138	0.267	0.5864	2.263
SAME AS PROV. OF	12	45-54	1	3017	31	16	26602	3048	1.017	0.525	-0.492	0.06	0.182	0.39983	0.617
RESIDENCE IN 1976	12	55-64	1	2912	25	15	22871	2937	0.851	0.511	-0.34	0.066	0.17	0.37293	0.478
	12	65+	1	3272	24	6	20990	3296	0.728	0.182	-0.546	0.029	0.148	0.326	0.402

NATIVITY	13	05-09	2	21	6	1	875	27	22.222	3.704	-18.519	0.114	8.001	17.602	4.62
	13	10-14	2	79	14	8	2211	93	15.054	8.602	-6.452	0.361	3.708	8.15786	6.896
CLASS 2	13	15-19	2	84	18	13	3143	102	17.647	12.745	-4.902	0.412	3.775	8.3042	9.343
	13	20-24	2	60	16	8	3070	76	21.053	10.526	-10.526	0.26	4.676	10.2882	10.764
FOREIGN BORN--	13	25-29	2	51	20	14	4502	71	28.169	19.718	-8.451	0.31	5.338	11.7445	16.424
	13	30-34	2	98	35	24	6961	133	26.316	18.045	-8.271	0.344	3.818	8.4003	17.916
BORN OUTSIDE OF	13	35-44	2	205	54	38	12467	259	20.849	14.672	-6.178	0.304	2.524	5.55324	15.296
	13	45-54	2	198	15	12	11134	213	7.042	5.634	-1.408	0.108	1.753	3.85685	3.185
CANADA	13	55-64	2	177	6	14	9112	183	3.279	7.65	4.372	0.153	1.316	2.89607	0.383
	13	65+	2	207	1	11	12316	208				0.089	0.48	1.055	-0.574

NATIVITY	14	05-09	3	192	74	66	1493	266	27.819	24.812	-3.008	4.233	2.748	6.0446	21.775
	14	10-14	3	302	75	76	2454	377	19.894	20.159	0.265	3.004	2.056	4.52319	15.371
CLASS 3	14	15-19	3	365	84	65	3219	449	18.708	14.477	-4.232	1.979	1.84	4.0489	14.659
	14	20-24	3	293	120	79	3898	413	29.056	19.128	-9.927	1.986	2.234	4.915	24.141
NON-NATIVE--	14	25-29	3	292	142	175	4671	434	32.719	40.323	7.604	3.611	2.252	4.9548	27.764
	14	30-34	3	293	120	148	4827	413	29.056	35.835	6.78	2.975	2.234	4.915	24.141
PROV. OF BIRTH	14	35-44	3	425	104	155	7766	529	19.66	29.301	9.641	1.957	1.728	3.80146	15.858
DIFFERENT FROM	14	45-54	3	294	43	71	6850	337	12.76	21.068	8.309	1.026	1.817	3.99839	8.761
PROV. OF RESIDENCE	14	55-64	3	296	13	55	6283	309	4.207	17.799	13.592	0.868	1.142	2.51248	1.695
IN 1976	14	65+	3	291	12	39	5422	303	3.96	12.871	8.911	0.714	1.12	2.465	1.496

	OBS	AGE	OBS	ASTAY	AOUT	ROUT	RSTAY	APOP76	OUTRATE	INRATE	NETRATE	ROUTRATE	S	ERROR	LCI
SEX	15	05-09	1	1636	111	72	14755	1747	6.354	4.121	-2.232	0.486	0.584	1.2839	5.07
	15	10-14	1	1763	76	73	16017	1839	4.133	3.97	-0.163	0.454	0.464	1.02113	3.112
CLASS 1	15	15-19	1	1981	118	76	19711	2099	5.622	3.621	-2.001	0.384	0.503	1.1061	4.516
	15	20-24	1	1811	231	87	20136	2042	11.312	4.261	-7.052	0.43	0.701	1.5421	9.77
FEMALE	15	25-29	1	1629	217	143	18485	1846	11.755	7.746	-4.009	0.768	0.75	1.6492	10.106
	15	30-34	1	1497	141	124	17691	1638	8.608	7.57	-1.038	0.696	0.693	1.5247	7.083
	15	35-44	1	2171	123	121	25898	2294	5.362	5.275	-0.087	0.465	0.47	1.0347	4.327
	15	45-54	1	1758	40	49	22167	1798	2.225	2.725	0.501	0.221	0.348	0.7652	1.459
	15	55-64	1	1791	27	47	19899	1818	1.485	2.585	1.1	0.236	0.284	0.62411	0.861
	15	65+	1	2069	19	28	21853	2088	0.91	1.341	0.431	0.128	0.208	0.457	0.453

SEX	16	05-09	2	1796	105	90	15545	1901	5.523	4.734	-0.789	0.576	0.524	1.1526	4.371
	16	10-14	2	1902	99	71	16965	2001	4.948	3.548	-1.399	0.417	0.485	1.06653	3.881
CLASS 2	16	15-19	2	2159	127	78	20253	2286	5.556	3.412	-2.143	0.384	0.479	1.054	4.502
	16	20-24	2	1836	280	82	20348	2116	13.232	3.875	-9.357	0.401	0.737	1.6206	11.612
MALE	16	25-29	2	1576	234	121	18611	1810	12.928	6.685	-6.243	0.646	0.789	1.735	11.193
	16	30-34	2	1570	144	99	17322	1714	8.401	5.776	-2.625	0.568	0.67	1.4741	6.927
	16	35-44	2	2244	146	116	26072	2390	6.109	4.854	-1.255	0.443	0.49	1.07774	5.031
	16	45-54	2	1751	49	50	22419	1800	2.722	2.778	0.056	0.223	0.384	0.84383	1.878
	16	55-64	2	1594	17	37	18367	1611	1.055	2.297	1.241	0.201	0.255	0.56008	0.495
	16	65+	2	1701	18	28	16875	1719	1.047	1.629	0.582	0.166	0.246	0.54	0.507