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Abstract

Using data from the 2002 Ethnic Diversity Survey (EDS), this paper compares fertility behavior across four groups of generations: recent and long-term immigrants of 1st generation, plus second and third generations. Several important findings emerge from this study: First, consistent with previous studies, we have documented higher current fertility among recent immigrants, but childbearing is lowest in the second generation. Second, although cumulative fertility tends to be significantly higher among long-term immigrants than recent immigrants, it becomes more similar to that of second and successive generations after adjusting for socio-demographic composition. This suggests that it is not generation per se, but compositional characteristics associated with generation groups that underlie fertility differentials. It can be argued that differences in the fertility patterns of long-term immigrants in Canada are likely to diminish as their socio-economic and cultural characteristics converge to those of the Canadian-born. This study also documents ethnic minority and age at arrival differences, suggesting higher fertility for those who are less acculturated or assimilated into the society.

Introduction

The effect of immigration on population change includes the impact through the fertility of immigrants. The differential fertility by immigrant generational status can be related to places of birth and to the integration into the host society. Fertility that is similar to that of the host society can be seen as a measure of assimilation or integration. Higher fertility could either be based on the countries of birth, or on difficulties of adaptation that would bring a higher reliance on family support. Alternatively, lower fertility may result from the difficulties of assimilation, as efforts are placed on socio-economic achievements that infringe on family building. It is important to not only measure the extent of the gap but to determine whether this gap varies by place of birth, ethnic minority, age of arrival in Canada, duration of residency (recent and long-term) or acculturation. To what extent are fertility variations associated with generational differences and can the gap be related to factors indicated above and/or to other demographic and socio-economic conditions associated with migration processes?

The Canadian patterns largely show lower fertility for the foreign born until the 1981 census and higher fertility since the early 1980s (Bélanger and Gilbert, 2003, 128; Maxim, 1996). For instance, using data from the 1991 census, Ng and Nault (2002) find that foreign-born women who came to Canada between 1986 and 1991 had a higher current fertility than those who immigrated in earlier years. Without the fertility question in censuses since 1991, and given the difficulty of using vital statistics to measure fertility of immigrants, Bélanger and Gilbert (2003) and Caron Malenfant and Bélanger (2006) have used the own-children method. For the 2001 census, the total fertility rate of

first-generation is estimated at 1.8, compared to 1.4 for second generation and 1.5 for

third generation or higher (Bélanger and Gilbert, 2003). Using the 1996 and 2001

censuses, fertility is found to be higher for the visible minority population as a whole,

with considerable variation across specific groups (Caron Malenfant and Bélanger, 2006).

In Sweden, Andersson (2004) finds higher fertility for immigrants in the first five

years after arrival, both at first birth and at higher order births. But, after a period of about

five years, the fertility of recent immigrants in Sweden did not significantly differ from

that of the native-born women. Bean et al. (2000) also indicated that first generation

Mexican-origin women in the United States had the highest fertility compared to non-

Hispanic whites, followed by the third or higher generation, and second generation

having the lowest fertility. In the United States, the fertility of Chinese immigrants is

found to be significantly lower than that of U.S. born Chinese and American Whites

(Yang, 2001). This may imply that the Chinese immigrants are more attached to the

Chinese culture, instead of being integrated into the mainstream of the U.S. Society.

Other studies also suggested that some immigrant groups are more likely to maintain

fertility behavior similar to that of their home countries (Coleman, 1994).

The fertility gap between recent immigrants compared to long-term immigrants or

native-born can be attributed to several reasons. Recent immigrants from high fertility

countries may sustain their traditional practices that reinforce and encourage adherence to

traditional pronatalist norms (Frank and Heuveline, 2005). This higher fertility may be

particularly the case for foreign-born populations who have a high level of contact with

their country of origin or with their sub-culture in the receiving country (Frank and Heuveline, 2005). In contrast, an assimilation hypothesis would suggest that, over time, immigrants fertility changes from the level at the place of birth to the level of the native born at the place of destination, as the socioeconomic characteristics of migrants converge toward those of the host society (Kahn, 1988; Ford, 1990). With the longer residence in the receiving country, traditional practices may be weakened or discouraged following also on improvements in socio-economic status. Longer stay also leads to integration of the immigrants into the culture of the receiving country and to changes in attitude regarding family size (Frank and Heuveline, 2005). Kahn (1988) also argues that the assimilation or integration process is more likely to decrease fertility for immigrants who migrate as children, as compared to those who migrate as adults. That is, persons who arrived in the country of destination during childhood are more likely to have their attitudes about fertility shaped by their experience in the host society.

However, some studies provide evidence for a disruption hypothesis which would mean that during the period immediately following immigration, foreign-born fertility is depressed, but subsequently rises and then declines as duration of stay increases (Stephen and Bean, 1992). According to the disruption hypothesis, migration itself is stressful and may lower fertility by separating spouses and delaying marriages (Stephen and Bean, 1992; Goldstein and Goldstein, 1983). Goldstein and Goldstein (1981) found a drop of fertility followed by an acceleration of fertility after migration and then stabilization in the long-term. In addition, migration is not a random process, but one in which migrants are selected by socio-economic status, such as education, occupation, income and marital

status, and therefore could be expected to have different fertility preferences compared to the populations at origin or destination (Hervitz, 1985; Kahn, 1988).

The present study considers these questions of cultural retention, disruption and assimilation in the Canadian case. We include measures of generation of Canadian residence, minority status, acculturation, place of birth and age at arrival, as well as socio-demographic characteristics.

Data and methods

In the absence of census data on fertility and of vital statistics data by immigration status, we take advantage of a large survey that was designed to capture ethnic variation in Canada, for both the foreign-born and Canadian-born populations. This 2002 Ethnic Diversity Survey (EDS) was not specifically designed to measure fertility. That is, there was no question on births in the last year, nor on children ever born. Instead, we measure current fertility through the question on the number of children under age two in the household, and we measure cumulative fertility of women of childbearing age through the number of children in the household.

We first provide descriptive results on age-specific fertility rates and average number of children by generation, visible minority status, place of origin, and age of immigrants at arrival. Because the sample size of immigrants' children under age two is too small when disaggregated by age at arrival, particularly among those who arrived during childhood, age at arrival is excluded from the analysis of current fertility. Next,

we use multivariate regression techniques to control for socio-demographic factors. To analyze current fertility, we use a logistic regression model because such a model is more appropriate when the outcome is dichotomous (presence or absence of a child under two years of age). To analyze cumulative fertility or the number of children, we use a Poisson regression model. In all our analyses, weights are used that adjusted for the sampling design of the EDS.

We distinguish three types of generations: 1st generation, 2nd generation, and 3rd generation or more. Members of the 1st generation are those born outside Canada. This group is further divided into short-term immigrants (those who arrived in Canada during 1991-2001) and the long-term immigrants (those who arrived in Canada before 1991). The second generation is defined as those born in Canada and at least one parent was born outside Canada. The third generation consists of those born in Canada and both of their parents were also born in Canada.

We measure the term "acculturation" through questions asking about sense of belonging. The sense of belonging to one's own ethnic group represents a relative preference for maintaining one's heritage culture and identity, while the sense of belonging to the wider Canadian society is captured through the relative preference for participating in the larger society along with other ethno cultural groups (Berry, 2008). The strength of sense of belonging to one's ethnic/cultural group is obtained from the question: how strong is your sense of belonging to your ethnic or cultural group? The responses for this question were separated into "weak" and "strong." The strength of

sense of belonging to the wider society is obtained through factor analysis based on three questions: how strong is your sense of belonging to city/town, province, and Canada. Once again, we distinguish the categories of "weak" and "strong." Following Berry (2005, 2008), we then created a new variable called "acculturation" by combining both measures of sense of belonging, to obtain the four following categories: marginalized, separated, assimilated, and integrated. Marginalization refers to individuals who have weak sense of belonging to both their own culture/ethnic identity and to the broader society. Separation represents individuals who have strong sense of belonging to their own group, but weak belonging to the broader society. Assimilation refers to individuals who have weak belonging to their own ethnic group but strong sense of belonging to the broader society. Integration refers to individuals who have strong sense of belonging to their own ethnic group and to the broader society.

Visible minority status is coded into five categories: Chinese, South Asian, Black, all other visible minorities, and not visible minority. Country of birth is coded into five categories: Canada, Europe, Asia and Middle East, Central and South America, Africa and other. The age of immigrants at the time of arrival in Canada is separated into three categories: immigrants who arrived before age 15, after age 15, and those of Canadian origin.

Other demographic and socio-economic factors of interest to this study are age of women, marital status, education, work status. Age refers to age of women at interview. Marital status differentiates between women who are ever married or currently in a

common law relationship, compared to the never married. Education is coded into three categories: high school or less, some college/university education, college/university diploma/degree. Work status is derived from the principal activity at the time of the survey and is categorized as: working, housework/family caring, going to school, or other main activities.

Results

Age-specific fertility rates and average children ever born
We begin our investigation by showing the patterns of age-specific fertility rates (current fertility) and average children ever born (cumulative fertility), by generation, place of origin, visible minority status, and age at arrival.

Although all generations have common fertility peaks at ages 30-34, marked differences in levels of current fertility are apparent between foreign-born and Canadian-born women, particularly the lower fertility of the second generation in each age group and the third generation after age 34 (Figure 1). At ages 15-24, the recent immigrants, arriving during 1991 to 2001, have the highest fertility. Figure 2 shows the differences in cumulative fertility between the foreign-born and Canadian-born groups. Consistent to the pattern of current fertility, at ages 15-35, the second generation is distinct with its lowest cumulative fertility, but at ages 35-44 this generation has a level of fertility that is similar to the third and subsequent generations.

Figure 1 & 2 about here

Figure 3 presents the age-specific fertility rates by visible minority status. It can be seen that the visible minority category displays distinctively lower fertility at younger ages (25-29) and higher fertility at older ages (30 or older) than the non-visible minority category. This suggests later childbearing among the visible minority groups. Figure 4 shows that the higher current fertility at younger ages and lower current fertility at older ages of the non-visible minority category translates into similar pattern of cumulative fertility, with higher cumulative fertility for visible minority at ages 35+. Figures 5 and 6 compare the age-specific and average children of Canadian-born and foreign-born. The foreign-born are shown to have higher current and cumulative fertility rates across all ages, but particularly at ages between 30 or above. Figure 7 indicates that average number of children is highest for those who arrived at older ages, in comparison to the Canadian-born and those who arrived at ages under 15. The higher fertility among those who were older at arrival may suggest that they are maintaining stronger links to the higher fertility norms of their country of birth (Abbasi-Shavazi and McDonald, 2000).

Figures 3 through 7 about here

While foreign born women have higher completed fertility than the Canadian-born, there are significant differences across groups as defined by place of birth, visible minority status, and age at arrival (Table 1). At ages 35-44, the highest completed fertility is for those born in Africa, followed by South America, then Asia and Middle East. The women classified as 'other' origins have an average fertility that is similar to that of the

Canadian-born. Turning to visible minority status, except the Chinese who had slightly lower fertility, all other minority groups had higher completed fertility at ages 35-44 than women born in Canada. Completed fertility is higher among immigrants who arrived at older ages (15 or older), compared with those who arrived at childhood ages and Canadian-born women.

Table 1 about here

Current and cumulative fertility, controlling for other factors

The bivariate analysis has shown that there are few differences in current and cumulative fertility rates between first and third generations, but fertility is lower in the second generation. Both current and cumulative fertility measures also tend to be higher among those born outside Canada, visible minorities, and those who arrived at ages 15 or older. Since these variations in fertility by generation, place of birth, visible minority status, and age at arrival can be due to other socio-demographic factors, it is useful to properly differentiate the independent effects of the various variables. In the following part of the paper, we present the results from multiple regression models to examine the net effect of generation, place of birth, age at arrival on current and cumulative fertility. Since generation, place of birth, and age at arrival overlap for the Canadian-born, separate models are used.

For current fertility, Model 1 shows the earlier results with highest odds of having a child under two for the recent arrivals (1991-2001) of the first generation, with lowest

fertility for the second generation (Table 2). When we control for visible minority status, acculturation, maternal age, education, work, and marital statuses, the difference across the different generations is no longer significant, though the second generation continues to have the lowest fertility. Noteworthy here is that the differences disappear between the earlier and later arrivals of the first generation. The comparison of Models 1 and 2 suggests that a greater part of the fertility variations across the generation groups is explained by other socio-demographic and ethnic/cultural factors.

The differences by visible minority status follow the pattern of the bivariate results, with the Chinese group having the lowest current fertility and the Black minority group showing the highest. There is very little difference in current fertility between the acculturation groups. As expected, current fertility decreases significantly as women's age increases. Work status and marital status exhibit significant effects on current fertility and are in the expected direction, with women who are working and studying, and never married having significantly lower current fertility. However, contrary to expectations, Table 2 shows higher fertility for women who have a college or university degree or diploma. These puzzling results may be partly a function of age, with the less educated women being older and having lower odds of having a child under two in the household. Also, the women with degrees may have delayed their childbearing and thus have higher current fertility.

Models 3 and 4 of Table 2 examine the link between current fertility and place of birth. It is evident from the unadjusted results (Model 3) that the odds of having a child

under two are highest among women born in Africa, followed by Central and South America, Other and Asia and the Middle East, and lowest among the Canadian-born and women born in Europe. After controlling for other factors, the odds retain the same pattern, but the differences are smaller, with higher odds for women born in Africa being the only ones that remain statistically significant. This suggests that a substantial part of the effect of place of birth is channeled through the socio-demographic variables included.

Table 2 about here

Table 3 presents the results for cumulative fertility, based on Poisson Regression models. The differences across generations show highest fertility for the earlier arrivals of the first generation, and lowest fertility for the second generation. After controlling for other factors, the differences are smaller but they follow the same pattern, with the lower fertility of the second generation remaining statistically significant (Model 2). These results are consistent with our earlier findings on current fertility. The substantial reduction in the magnitude and significance of fertility deviation between the long-term and short-term immigrants, and their similarity to the levels for third generation, would suggest that these differences were a function of other socio-demographic characteristics.

Models 3 and 4 present the results for place of birth. Marked differences are evident between birth place groups where fertility is 46 percent higher among those born in Central and South America, 28 percent higher for African origins, and 23 percent

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among the Asian and Middle East born, in comparison to the Canadian-born (Model 3). However, after controlling for the socio-demographic factors, the differences are smaller and only the deviations of the birth places of Central America and Asia and Middle East remain statistically significant.

Consistent with the descriptive results of the cumulative fertility, Model 5 indicates that women who arrived at older ages (15 or older) have significantly higher number of children in the household compared with their younger counterparts. However, when the socio-demographic variables are held constant, age at arrival appears to have no significant effect on number of children in the household (Model 6). This may suggest that the lower fertility among women who arrived before age 15 years is not due to the effect of childhood age per se, but due to other socio-demographic effects.

Important variations in cumulative fertility are also evident among the visible minority and acculturation groups with lowest fertility for the Chinese group, and highest fertility for the Black group followed by the South Asians and other visible minority (Model 4). Fertility is also lowest for the marginalized and separated groups of the acculturation factor. The marginalized group refers to individuals who have weak sense of belonging to both their own ethnic/cultural group and to the wider Canadian society, while separated group refers to those with strong ethnic/cultural sense of belonging but weak sense of belonging to the wider society. Fertility is higher for those who are more assimilated or integrated, as measured by the sense of belonging.

As expected, cumulative fertility increases with age and is higher for married women in comparison to the never married. Fertility decreases with education, with more educated women having significantly lower fertility. By work status, the highest levels are shown for those doing household work or family caring as their main activity and it is particularly low for women going to school.

Table 3 about here

Discussion and Conclusion

This study addresses two primary questions about immigrant fertility. The first concerns fertility variations by immigrant generation and place of origin, or age at arrival. Secondly, to what extent can these variations be explained by socio-demographic and/or other cultural or ethnic factors? The answers to these questions are important for two reasons. First, variations in fertility by immigrant generation may impact fertility levels and their projections for the country as a whole. In addition, the fertility across generations and place of origin or age at arrival provide important clues about the assimilation or adaptation process among first and successive generations of immigrants.

This study yields several interesting findings. First, in our unadjusted models, we found significantly higher current fertility among recent immigrants, compared to long-term immigrants or Canadian-born women. However, after controlling for other factors the higher current fertility of recent foreign-born women diminishes and becomes similar

to the fertility levels associated with long-term resident immigrants or Canadian-born women.

Second, although recent immigrants exhibit higher current fertility than immigrants who have a longer association with Canada, the recent arrivals have lower cumulative fertility. This could suggest that recent immigrants have not made up for the fertility delays associated with migration.

Third, although we found fertility discrepancies between short- and long-term immigrants, we have documented considerable similarity of the cumulative fertility pattern between immigrants and Canadian-born women after adjusting for the socio-demographic variables. The patterns by age show that foreign-born immigrants (1st generation, both recent immigrants who arrived during 1991-2001 and long-term immigrants who arrived before 1991) exhibit significantly higher average number of children than Canadian-born women (both 2nd and 3rd generations). In addition, the univariate results indicate that the rate ratios of having children are higher among the foreign-born than among their Canadian-born counterparts. But this pattern is no longer significant after holding the socio-demographic composition constant. In fact, the results show that the rate ratios of children in the household (cumulative fertility) of the long-term foreign-born are substantially reduced and not significantly different compared to the third generation. This suggests that the higher first generation fertility is a function of socio-demographic characteristics. Other studies have found lower fertility among

immigrants in the U.S. than among natives after adding controls such as education, age, marital status (Blau, 1992) and income, education, and ethnicity (Kahn, 1994).

Place of birth is also significantly associated with both current and cumulative fertility, the odds of having children being significantly higher among immigrants whose origin is from high fertility countries including Africa, Central and South America, and Asia and Middle East. However, the effect is attenuated in both magnitude and statistical significance after adjusting for the socio-demographic factors.

Adaptation theory suggests that those who migrated as children are more likely to adapt to the host society. We find in particular that cumulative fertility is higher for those who arrived after age 15. This suggests that immigration at a younger age facilitates assimilation to the childbearing norms of the receiving society (see also Abbasi-Shavazi and McDonald, 2000).

The findings of this study also provide another important insight into the relationship between visible minority status and fertility. One notable finding is that the Chinese minority has the lowest current and cumulative fertility. The lower fertility of the Chinese visible minority in comparison with the other visible minority groups may be partly explained by the fact that the Chinese group is emphasizing socio-economic integration into the Canadian society at the expense of childbearing. Other research has found that immigrants from Mainland China, when they first came to the U.S., had a lower fertility than American whites because of the impact of the family planning

policies in China (Hwang and Seanz, 1997). That is, the lower fertility of Chinese immigrants, compared with U.S.-born Chinese and American whites, might also be viewed as an outcome of the carryover of reproductive norms in the place of origin. Similarly, the significantly higher current fertility among the Black minority followed by South Asian and Other visible minority, and higher cumulative fertility among the Black minority followed by the Other visible minority groups, can partly be accounted for by their lack of cultural or political integration to Canadian society.

The findings with regard to acculturation are also noteworthy. While the differences in current fertility were not significant, it was found that women who are assimilated and integrated to the mainstream of the Canadian society have higher fertility than the ones who are marginalized or separated. It would appear that fertility is lower for those who have less of a sense of belonging to their ethnic group and to Canadian society. This may indicate that the marginalized and separated have difficulty achieving their fertility goals. Further investigation is needed to complement our findings and to search for explanations.

It is important to recognize the limitations of this study. While the Ethnic Diversity Survey has rich data on immigrant generations, origins and ethnicity, it was not designed to specifically examine fertility. In particular, the survey did not collect information on births last year and on the total children ever born. Consequently, these two variables are measured by proxy measures (children under age two for current fertility, and children in the household for cumulative fertility). Also, though we tried to
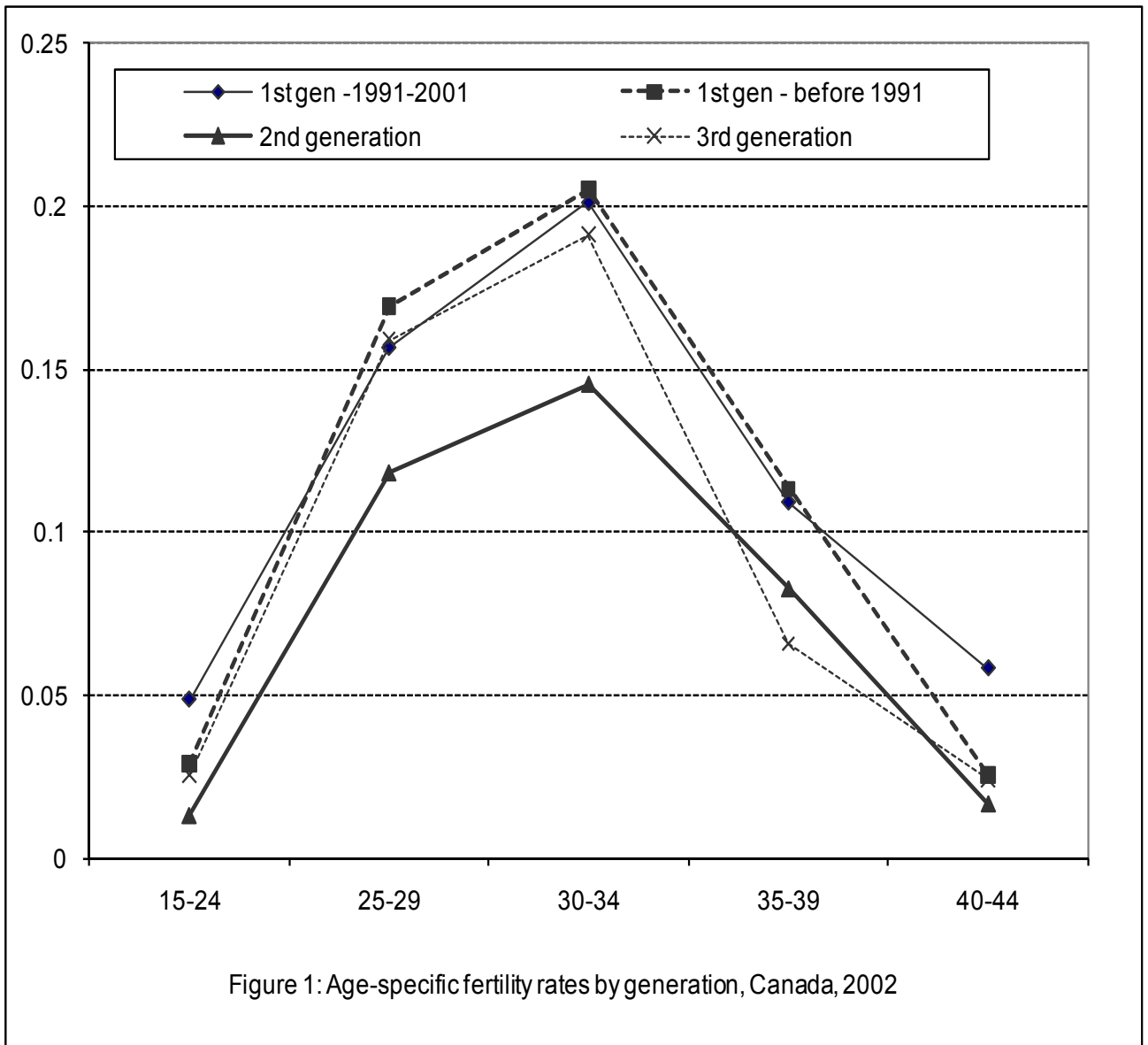
control for a set of characteristics in order to understand the sources of variations in fertility among the different generations of foreign-and Canadian-born women, there are other factors that were not available, such as the socio-economic characteristics of foreign-born women before migration.
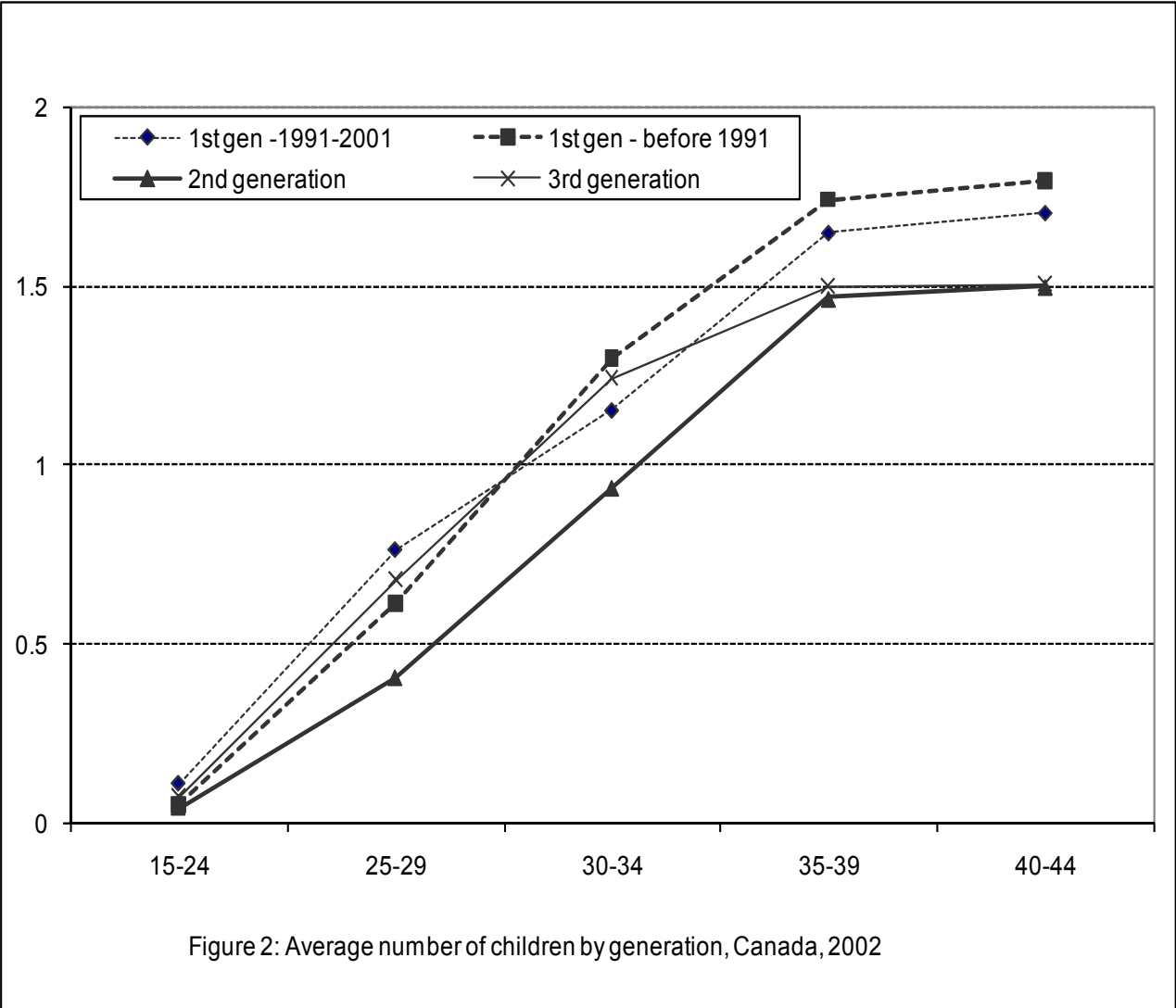
Nonetheless, we have documented important patterns in Canadian fertility by immigration status. Fertility is higher for the foreign-born, but after controls for other factors it is especially the lower fertility of the second generation that is noteworthy. There are considerable differences across places of origin, especially the higher cumulative fertility of women born in Central and South America, the higher current fertility of women from Africa, and the lower fertility of the Chinese visible minority. The decline in differences once controls are introduced for other socio-demographic factors, and the lower fertility of women who are less assimilated or integrated into Canadian society, suggest that adaptation over time is in the direction of convergence with the receiving society, especially if there is adequate socio-economic integration.
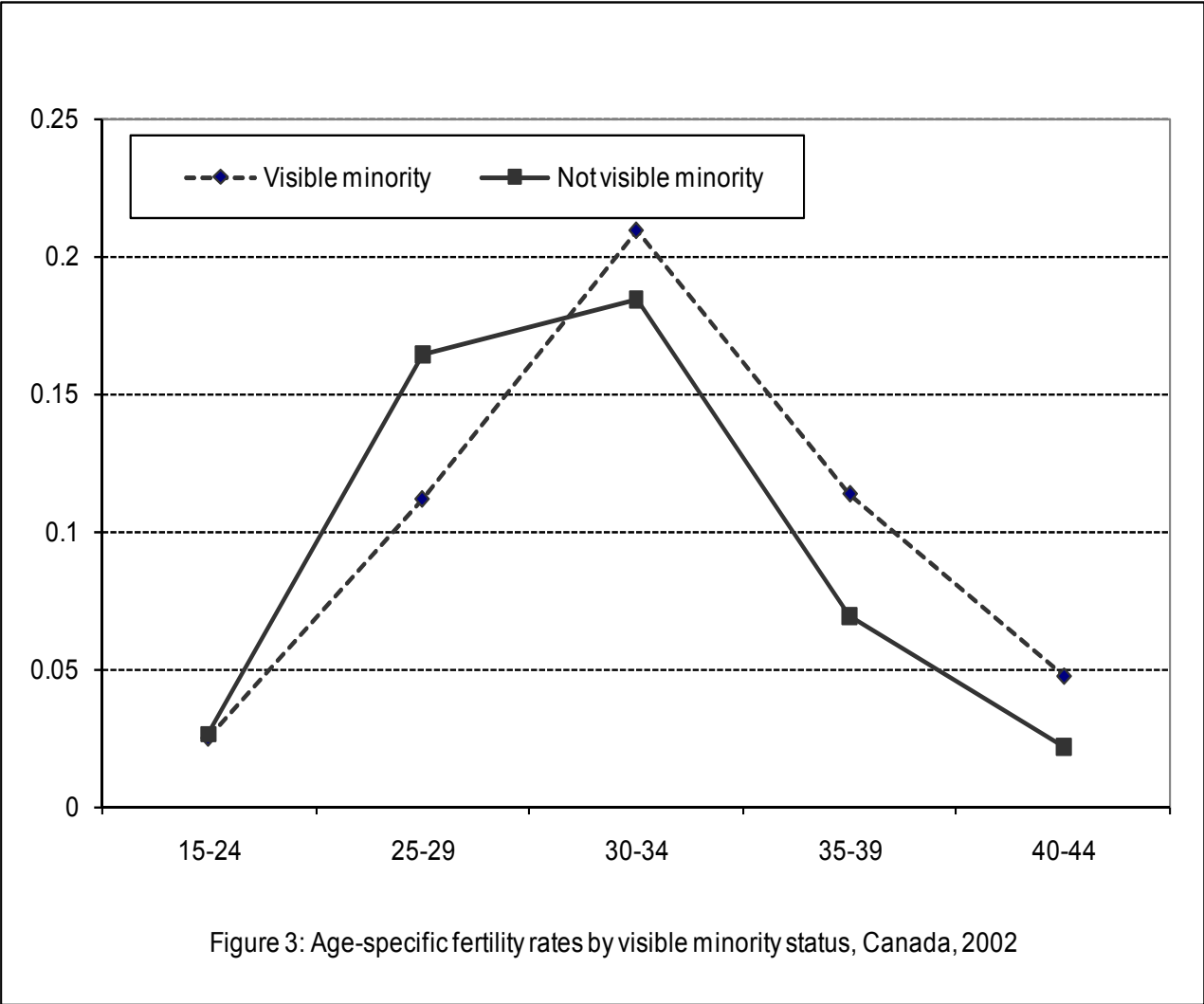
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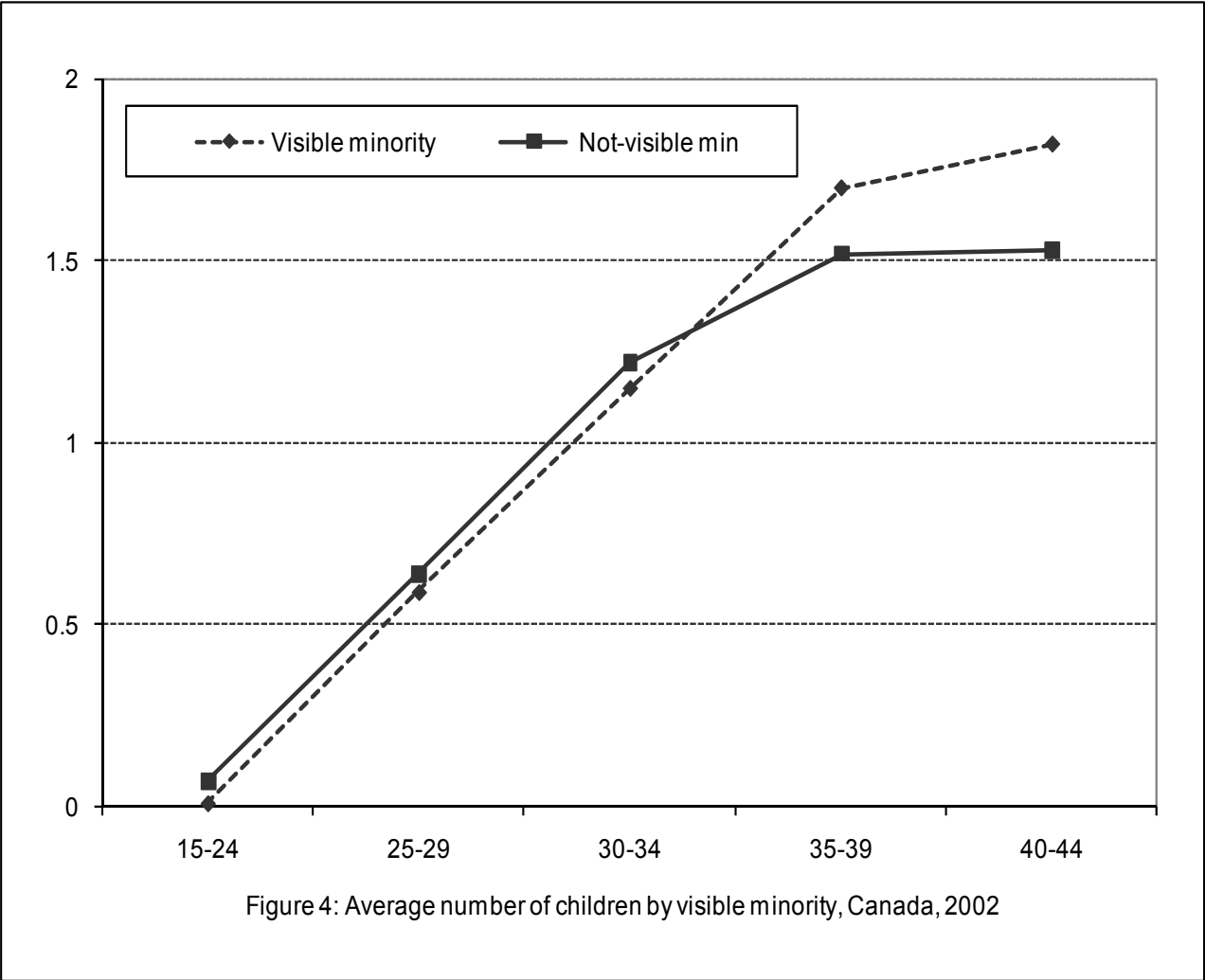
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Figure 1: Age-specific fertility rates by generation, Canada, 2002

Figure 2: Average number of children by generation, Canada, 2002

Figure 3: Age-specific fertility rates by visible minority status, Canada, 2002

Figure 4: Average number of children by visible minority, Canada, 2002
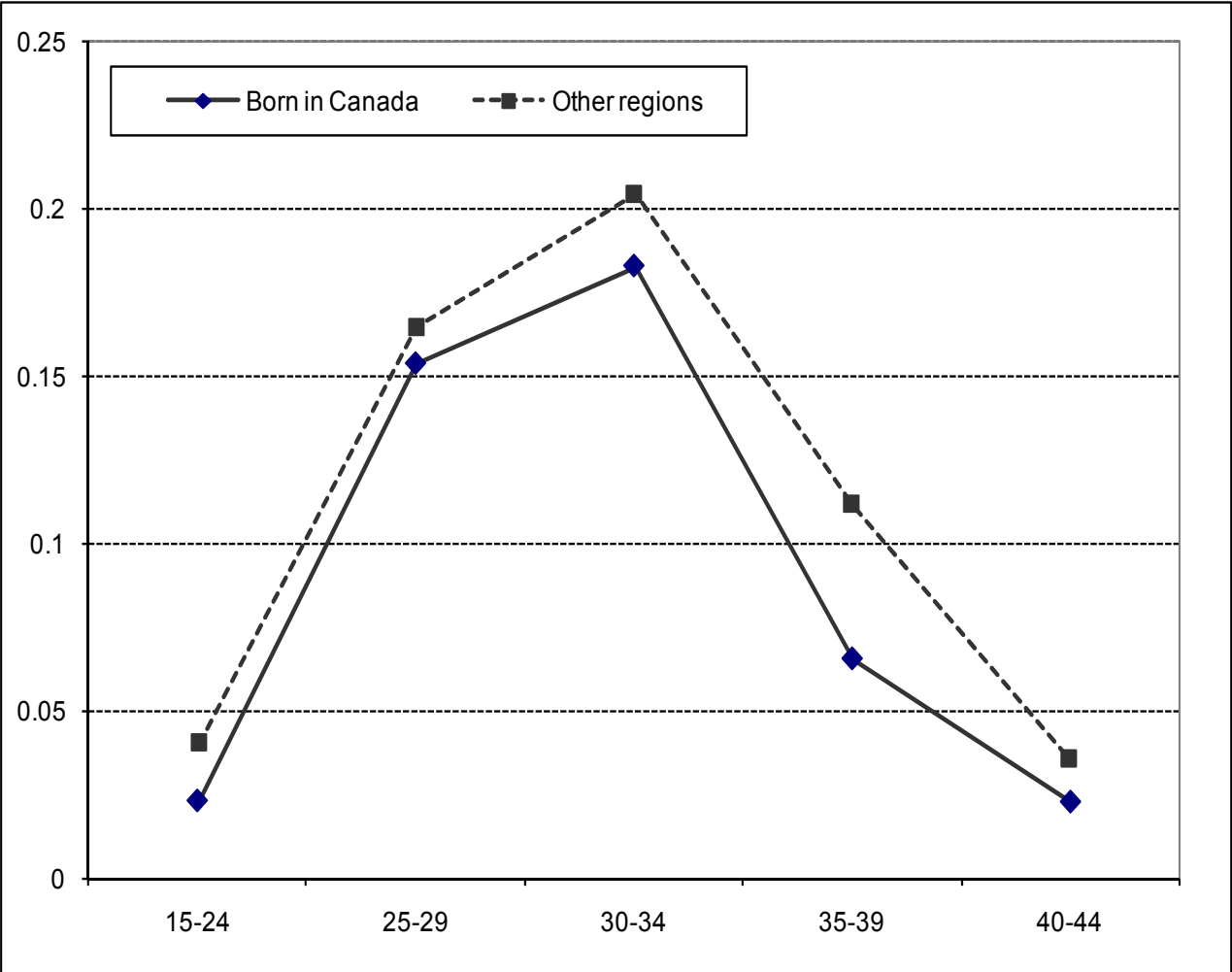
Figure 5: Age-specific fertility rates by country of birth, Canada, 2002

Figure 6: Average number of children by place of birth, Canada, 2002

Figure 7: Average number of children by age at arrival, Canada, 2002
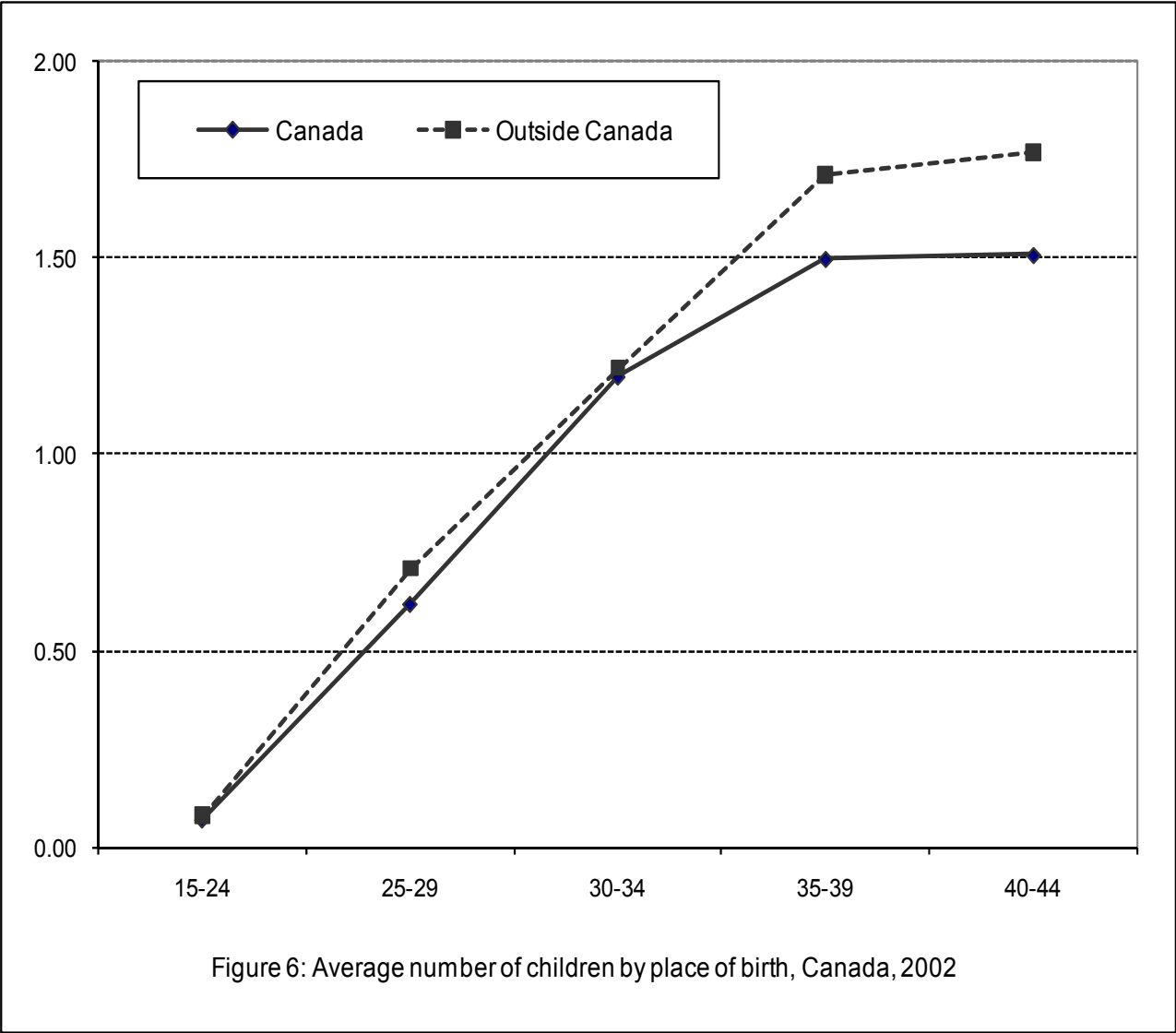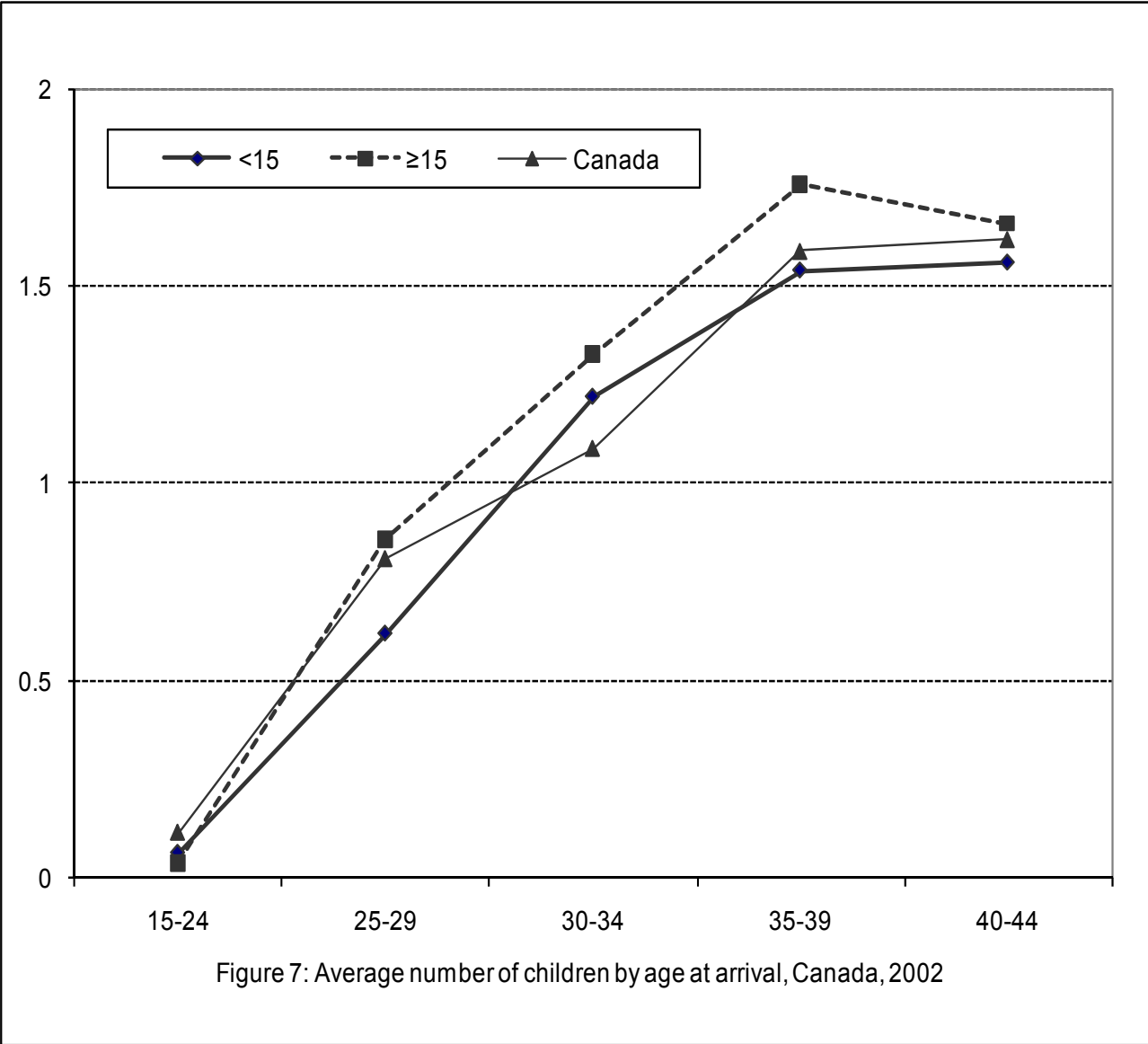
Table 1: Average number of children of foreign-born (first generation) versus Canadian-born by place of birth, visible minority and age at arrival, women aged 35-44, Canada, 2002			
Variables	Canadian-born	Foreign-born (1st Generation)	Differential from Canadian-born
Place of birth			
Canadian-born (2nd & 3rd generation)	1.50		-
Europe		1.59	0.09
Asia & Middle East		1.75	0.25
Central, South America & Caribbean		2.00	0.50
Africa		2.20	0.70
Other		1.50	0.00
Visible minority			
Chinese		1.47	-0.03
South Asian		1.93	0.43
Black		1.73	0.23
Other visible minority		1.84	0.34
Not visible minority		1.52	0.02
Age at arrival			
<15		1.55	0.05
≥15		1.80	0.30
Total		1.76	0.26

Table 2 : Logistic regression models of current fertility by selected factors, Canada, 2002				
Variables	Model 1	Model 2	Model 3	Model 4
Generation				
1st generation between 1991-2001	1.66***	1.2	-	-
1st generation before19 91	1.09	1.26	-	-
2nd generation	0.81**	0.85	-	-
3rd generation	1	1	-	-
Place of birth				
Europe	-	-	1.19	1.16
Asia & Middle East	-	-	1.21*	1.35
Central, South America & Caribbean	-	-	1.86***	1.39
Africa	-	-	2.00***	1.89*
Other	-	-	1.69*	1.55
Canada	-	-	1	1
Visible minority				
Chinese		0.73		0.65
South Asian		0.80		0.72
Black		2.32***		2.00**
Other visible min		1.17		1.04
Not-visible min		1		1
Acculturation				
Marginalization		0.88		0.88
Separation		0.99		0.96
Assimilation		1.09		1.03
Integration		1		1
Age		0.86***		0.86***
Education				
High school or less		0.30***		0.32***
Some university education		0.49***		0.49***
University diploma/degree		1		1
Work status				
Working		0.17***		0.18***
Household work/caring family		1.37**		1.45**
Going to school		0.05***		0.05***
Other main activities		1		1
Marital status				
Never married		0.08***		0.08***
Married		1		1

Table 3: Poisson regression models of children in the household by selected variables, Canada, 2002						
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Generation						
1st generation between 1991-2001	1.09***	0.96	-	-	-	-
1st generation before 19 91	1.40***	1.06	-	-	-	-
2nd generation	0.87***	0.93**	-	-	-	-
3rd generation	1	1	-	-	-	-
Place of birth						
Europe			1.27**	1.01	-	-
Asia & Middle East			1.23***	1.15*	-	-
Central, South America & Caribbean			1.46***	1.24***	-	-
Africa			1.28***	1.15	-	-
Other			1.18*	0.9	-	-
Canada			1	1	-	-
Age at arrival(years)						
<15			-	-	0.79***	1.00
>=15			-	-	1.54***	1.06
Canada			-	-	1	1
Visible minority						
Chinese		0.80***		0.70***		0.76***
South Asian		1.14**		1.03		1.11*
Black		1.36***		1.16		1.31***
Other visible minority		1.12**		0.97		1.08
Not-visible minority		1		1		1
Acculturation						
Marginalization		0.87***		0.87***		0.87***
Separation		0.90***		0.92***		0.92***
Assimilation		1.02		1.01		1.01
Integration		1		1		1
Age		1.05***		1.05***		1.05***
Education						
High school or less		1.10***		1.12***		1.12***
Some university education		1.05***		1.05**		1.05**
University diploma/degree		1		1		1
Work status						
Working		1.11		1.07		1.07
Household work/caring family		1.82***		1.78***		1.78***
Going to school		0.51***		0.51***		0.51***
Other main activities		1		1		1
Marital status						
Never married		0.22***		0.24***		0.24***
Married		1		1		1

Note: Coefficients are exponentiated and expressed as rate ratios