

Educational and Labor Market Attainments of the 1.5- and Second-Generation Children of East Asian Immigrants in Canada

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Abstract

Using data from the most recent 2011 Canadian National Household Survey, educational, occupational, and earnings attainments of the East Asian 1.5- and second-generation groups are compared with those of the White third-plus generation. Specific attention is paid to those with both parents born in the People's Republic of China, Hong Kong, Taiwan, Korea, Japan, and in the Southeast Asian country of Vietnam. While East Asian offspring exhibit higher levels of education compared with the white third-plus generation and are more likely to have science and business majors, these more advantageous educational profiles relative to a White majority population do not mask economic inequality, as suggested by the model minority myth. Instead, for most groups a straightforward model holds, in which higher educational levels and majors usually translate into higher chances of professional employment and higher earnings for the 1.5 and second generations in Canada.

Keywords

second generation, Asian American, East Asian, model minority, overeducation

Introduction

Originating as White settler colonies, Canada and the United States are major immigrant destination areas, with large migrant populations, standing in 2011 at 21% or 6.8 million for Canada and 13% or 40.4 million for the United States. Although the United

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States remains unique with its Mexican-origin population, both countries witnessed large increases in Asian migration following the removal of national origins as the criterion of admissibility in the 1960s and 1970s (Boyd, 1976); today, 45% and 29% of the respective 2011 foreign-born populations in Canada and the United States are from Asian countries. As a result of post–World War II geopolitical reconfiguration of East Asia and the Korean and Vietnamese wars (Lee & Zhou, 2015; Paik, Kula, Saito, Rahman, & Witenstein, 2014; Zhou, 2014), East Asia is an important source region, representing 32% and 31% of the respective 2011 Asian foreign-born populations in Canada and the United States (Gyn & Gambino, 2012; Statistics Canada, n.d.).

The arrival of newcomers inevitably raises questions about incorporation, including acculturation and participation in societal institutions such as education, the economy, and the polity. Related debates consider how incorporation is conceptualized, including discussions of minority–majority relations, discrimination, and opportunity structures. Scholars also observe that migrant incorporation occurs over the life span of immigrants and involves their children, both those who are foreign born but arrive at an early age, generally pre–high school (1.5 generation), and those born in the destination country (second generation).

The Asian population is well researched in the United States regarding educational and economic status, discrimination, and most recently, the model minority myth (e.g., Chou & Feagin, 2015; Lai, 2013; Kao & Thompson, 2003; Sakamoto, Goyette, & Kim, 2009; Sakamoto, Takei, & Woo, 2012). Yet U.S. investigations into the labor market attainments of immigrant offspring are restricted by the absence of questions on parental birthplace on the American Community Surveys (ACS) and by small sample sizes for alternative data sources such as the Current Population Survey. With rare exceptions (Takei & Sakamoto, 2009; Yang, 2011), researchers study the labor market attainments of only the 1.5 generation; they focus on the monolithic “Asian” category or they equate the American-born population of a specific Asian origin group as representing the second generation (Kim & Sakamoto, 2010; Takei, Sakamoto, & Kim, 2013; Takei, Sakamoto, & Powers, 2012).

A Canadian focus extends knowledge on the educational and labor market attainments of East Asian children of immigrants in North America, and it overcomes the limitations found in U.S. approaches in four ways. First, the 1.5 generation and the second generation are directly measured because birthplace of parents questions were asked on Canadian censuses beginning in 2001; adequate sample numbers are available from the 2011 National Household Survey (NHS) which samples one in three Canadian households. Second, the analysis goes beyond singling out Chinese immigrant offspring (see Oh & Min, 2011; Reitz, Zhang, & Hawkins, 2011; Rumbaut, 2008) by including Korea, Japan, and Vietnam origins. Third, compared with the use of ethnic affiliation or racial identity, we more precisely define origin groups by combining respondents’ racial identities (Chinese, Korean, etc.) with parental countries of birth. Fourth, the “Chinese” are dehomogenized into those with parents from the People’s Republic of China (PRC), Hong Kong, and Taiwan.

Embedding the analysis within the context of existing conceptual frameworks on the socioeconomic integration of the broader Asian American population, we compare

the educational, occupational, and earnings attainments of the Canadian East Asian 1.5- and second-generation groups with the White third-plus generation. Consistent with recent critiques (Sakamoto et al., 2009; Sakamoto et al., 2012), our analysis produces little evidence for the model minority myth for the 1.5- and second-generation East Asian groups. While East Asian offspring exhibit high levels of education, this overeducation, relative to a White majority population, does not mask economic inequality. Instead, for most groups, a straightforward model holds, in which higher educational levels usually translate into higher chances of professional employment and higher earnings for the 1.5 and second generations in Canada.

Framing Generational Outcomes

Investigations into the educational and labor market attainments of the children of immigrants are rooted in two stratification paradigms that also shape investigations into migrant integration. The first emphasizes equality of opportunity; the second emphasizes pernicious majority–minority relations in which inequalities of power, wealth, and status are produced and maintained through discrimination, often against groups defined as phenotypically different from the dominant majority. Related to this latter perspective is a scenario that implies labor market disadvantages for children of Asian migrants who conform to the Asian “model minority” model but where overeducation masks labor market discrimination.

The equality of opportunity model encapsulates the American dream of unfettered economic success where outcomes reflect individual effort and hard work. Within the North American social stratification field, disparate socioeconomic outcomes for migrant and host country populations are problematic, as they suggest inequality of opportunity and reduced life chances. A concept developed by 19th-century social scientist Max Weber, life chances have more recently been redefined as characteristics associated with membership in economic classes and productive roles (see Tumin, 1967). Life chances typically refer to physical and mental health, levels of education, levels of poverty, quality of housing and neighborhoods, occupations, and income.

From this perspective, it is understandable that the socioeconomic integration of immigrants is a major site of investigation, with emphasis on securing employment and generating livelihoods. North American and European studies find migrants who arrive as adults experience labor market difficulties for any number of reasons. Compared with those born in the destination country, they may be less linguistically fluent (Adamuti-Trache, 2012; Kulkarni & Hu, 2014; van Tubergen & Kalmijn, 2005); their education, fields of study, or professional training may not be equivalent or not well recognized by employers (Arbeit & Warren, 2013; Kanas & van Tubergen, 2009; Kaushal, 2011), and there may be hiring and promotion barriers consistent with discrimination (Dechief & Oreopoulos, 2012).

However, according to equality of opportunity-based arguments, in a meritorious society, difficulties experienced by migrant parents should not extend across generations. Instead, the labor market experiences of their children, notably those arriving at young ages and those born in the host country, should be much like the experiences of

those further removed from the migration experience; they are all exposed to the destination country's schooling system, language(s), media and culture, and labor market institutions as youngsters. Arguably, not all children of migrants will have identical outcomes in educational attainments or in the labor market. Sociologists note that parental and familial resources vary; such differences shape the children's educational attainments and occupational aspirations; economists argue individuals vary in talent, and this affects labor market outcomes. But the equality of opportunity argument suggests equally endowed offspring should have similar locations in socioeconomic hierarchies; thus, those with similar educational levels should have similar occupational locations and similar earnings.

This latter premise was articulated over 50 years ago by Duncan and Duncan (1968). In their multivariate research design, compositional differences among racial groups were important sources of labor market differences. In what is now labelled the demographic heterogeneity perspective (Kim & Sakamoto, 2010), differences between groups defined on the basis of ascriptive status such as sex, origins, race, or generational status should largely disappear after controlling for characteristics known to influence socioeconomic outcomes. Conversely, the persistence of large gaps can indicate the omission of important predictors (such as parental education and family of origin characteristics) or the persistence of barriers thrown up by ascriptive distinctions.

This research design exists in a number of studies of the Asian population in the United States with extensions to a limited number of studies on the 1.5 generation and/or on specific origin groups (Hirschman & Wong, 1981; Sakamoto et al., 2012; Takei et al., 2013; Takei & Sakamoto, 2009). Because it rests on a generalized theory of status attainment and stratification, focuses on socioeconomic outcomes, and analyzes large surveys such as censuses of population, the demographic heterogeneity approach is most congruent with the linear—or straight line—assimilation model for immigrants and their children. The model envisions upward social mobility across generations, with growing convergence in the socioeconomic attainments between the large third-plus generation and the children of immigrants (Alba & Nee, 2003; Portes & Zhou, 1993). To the extent that group differences in socioeconomic outcomes, such as education, occupational location, and earnings, exist, they can be understood as reflecting differences between groups in characteristics highly associated with economic outcomes. In this approach, differential labor market outcomes between children of immigrants and the dominant majority population should disappear after differences between groups in labor market-relevant characteristics (age, education, marital status, etc.) are taken into account, usually through multivariate statistical modeling.

In contrast, the majority–minority model emphasizes asymmetries between the White majority and racialized minorities in power, wealth, and status. Most telling for minority groups, including those defined by race, ethnicity, and/or migrant status, is their exclusion from full participation in the dominant institutions of a society on the basis of these defined (ascriptive) characteristics (Wirth, 1945). Thus, the general majority–minority model stipulates a hierarchy of advantage–disadvantage in which

immigrants and racialized groups, regardless of their skills and capabilities, do less well in the labor market than the majority White population, largely because of unfair treatment (discrimination). For children of immigrants, systemic and institutionally embedded racism means the cross-generational persistence of discrimination, creating alternative models of segmented assimilation for immigrant offspring (Portes & Zhou, 1993).

Unequal relations between dominant and minority groups are the bedrock for the Asian model minority approach and the related overeducation perspective developed by American scholars. The U.S. Asian population is considered a racially defined minority, but a “model minority” in that education levels exceed those of the dominant White population, economic success is evident and rates of single-parent families and incarceration are low. The overeducation perspective refers to these favorable outcomes but argues Asian minorities reach economic parity with Whites only because they have higher education. When compared with similarly educated Whites, the earnings of Asian groups are substantially lower, implying they do not receive the same labor market rewards (Hirschman & Wong, 1981; Sakamoto et al., 2009; Sakamoto et al., 2012).

Several critical summaries (Sakamoto et al., 2009; Sakamoto et al., 2012) note that much of the evidence for the overeducation arguments rests on 30-year-old data, and frequently but inadvertently compares Asian immigrants with American-born Whites. An additional compelling test is what happens to the next generations of Asian origin offspring exposed at early ages to host society institutions. Are these offspring characterized by higher educational levels compared with the White majority, as suggested by the model minority thesis? What are the occupational locations and earnings of East Asian children of immigrants compared with a designated White majority? When compositional characteristics (including education) are considered, do labor market advantages relative to a designated White reference group become negative as suggested by the overeducation perspective, or do differences disappear as implied by the demographic composition approach?

Data and Methods

These questions are answered with data from the one in three household sample of the National Household Survey (NHS) fielded by Statistics Canada between May and August 2011. The NHS is a voluntary, self-administered survey of private households, mandated by the Conservative Party of Canada majority federal government in 2010 as a replacement for the mandatory 2B long-form census questionnaire. Consistent with other voluntary surveys, the overall response rate is 69% (Green & Milligan, 2010), although some small areas have substantially lower response rates and/or high item nonresponse rates to select questions. Statistics Canada thoroughly checked the quality of responses for many variables. It appears the survey is internally robust; the relationships between variables observed with 2006 data hold for the 2011 NHS. As observed by critics of the shift to the voluntary survey in 2011, the real issue is not the quality of the data but the compromised ability to keep identifying and/or correcting

for nonresponse biases in future voluntary surveys temporally more distant from the benchmark 2006 census data.

With the exception of several language questions being moved to a shorter 2A census questionnaire (where responses are legally required) and the dropping of three questions on unpaid work, the 2011 NHS questions are the same as those in the 2006 long-form census. In keeping with the 2001 and 2006 censuses, generation groups are created from responses to questions on birthdates and birthplaces of respondents, birthplaces of parents, and year of immigration for permanent residents. Three groups of interest are the 1.5 generation defined as foreign born but immigrating before the age of 13 years; the second generation, or those born in Canada with foreign-born parents; and the third-plus generation, or those born in Canada with both parents born in Canada. All generation groups include only those who are permanent residents of Canada and live in private households. Persons who are not permanent residents of Canada, members of collective units or residing in institutions are excluded. Unlike the U.S. census or ACS, respondents are asked to indicate if they have been legally admitted to Canada as permanent residents; this question permits the exclusion of temporary residents, including students, refugee claimants, and temporary workers. Also unlike the United States, the number of temporary or undocumented Mexican origin groups is very small. Out of a 2011 national population of 32.9 million, approximately 96,000 listed Mexican ethnic origins (multiple responses are permitted) of which 46,000 are permanent residents and 13,000 are in Canada temporarily.

Given the volume of East Asian (and Vietnamese) migration in recent years to North America, we study the attainments of East Asian 1.5 and second generations; however, they are still young, reside primarily in large cities, and the populations are small. These characteristics define the study population. First, the focus is on the population aged 25 to 39 years; the usual selection of the general working age population aged 25 to 64 years risks maximizing inequalities because the comparisons are between younger adults and an older reference population, usually the third-plus generation. In keeping with the age restrictions, the analysis omits persons still in school; not only is their education incomplete but they may be employed part-time or in jobs they will not normally hold on school completion. Second, the analysis is for populations residing in Census Metropolitan Areas (CMAs). Most East Asian immigrants live in cities of 100,000 or more, defined as CMAs; their children follow a similar residential workplace pattern, whereas the White third-plus generation has a larger percentage residing in smaller cities or in rural areas. National comparisons risk minimizing Asian White disadvantage since cities frequently have more complex economies and higher average wages than smaller areas. Third, sample size means only the larger East Asian origin groups can be studied: PRC, Hong Kong, Taiwan, South Korea, Japan, and Vietnam. Vietnam is usually considered part of Southeast Asia, but is included here because, as noted by Van Chinh (2013), China and Vietnam share a long border, and there is a long history of migration between the two countries. In fact, children of immigrants from Vietnam include those who identify racially as Chinese although sample sizes prevent further disaggregation in the analysis. In addition, from the late 1970s on, Canada accepted a large number of Vietnamese migrants in the aftermath of

the Vietnamese War; consequently, those of Vietnamese origins are a numerically important component of 1.5- and second-generation youth (see Table 1).

Because of the availability of NHS questions on race and country of parental birthplace, the origins of the 1.5- and second-generation East Asians are defined more precisely than in most North American studies which use ancestry or racial identification to define origin groups. Our analysis uses both the respondents' racial self-identifications and parental birthplace information. For example, 1.5- and second-generation Chinese with Hong Kong origins not only are identified as Chinese in a "race" question but have two parents born in Hong Kong; similarly, the Korean 1.5 and second generation consist of those who self-identify as Korean and have two parents born in Korea. This methodology enables greater specification of the Chinese children of immigrants by the country of parental origin and permits holding constant (by exclusion) the possible effects of parental intermarriage as a result of earlier migrations between East Asian countries. The methodology also means the exclusion of the 2.5 generation, defined as Canadian born with one Canadian born and one foreign-born parent. Here, the second generation refers to those Canadian-born with two foreign-born parents.

Although our analysis rigorously defines the origins of East Asian young adults, the reallocation of parents (and their offspring) to their countries of birth masks the experience of those with extensive residence in a different country. For example, migration from PRC to Hong Kong is well-established, and an analysis of the 2006 Hong Kong census shows the children of these migrants who are in their early to mid-20s have higher levels of educational, occupational, and earnings attainments than those with Hong Kong born parents (Zhang, 2014). This finding may reflect only recent flows, but if it holds for earlier periods, our procedure is not capturing this twice-migrated impact; instead, it is allocating such parents and their offspring to PRC. The size of this reallocation and its potential importance cannot be determined with census data, as such knowledge requires parental migration histories outside the destination country.

This study examines the educational attainments of the children of East Asian immigrants, their likelihood of having professional occupations, and their earnings. Educational attainments of the children of immigrants is well-studied in stratification research; parental educational levels, class background, and growing up in two-parent households are often heralded as influential factors for high school test scores and university completion (Azzolini & Barone, 2013; Pong & Landale, 2012; Zhang, 2014). But censuses and large general national surveys do not routinely collect such background information. Furthermore, while data on parental education are available when children and parents coreside, they are not available when young adults are not living with their parents. Reflecting these data gaps, we briefly discuss information on several educational characteristics without additional multivariate analyses of the patterns. Specifically, for the children of East Asian immigrants, data are presented for the highest levels of educational attainment and for the fields of study for the highest level attained beyond high school. Xie and Goyette (2003) argue the latter variable is important for understanding occupational outcomes of Asian Americans; yet until 2009, the

Table 1. Demographic, Social, and Economic Characteristics of East Asian-Origin 1.5 and Second Generations and White Groups, Aged 25 to 39 Years, Living in Census Metropolitan Areas, and Not Attending School, Canada, 2011.

	1.5 and second generations, both parents born in specified country															
	Chinese, People's Republic of China		Chinese, Hong Kong		Taiwan		South Korea		Japan		Viet Nam		1.5- and second-generation White		Third-plus generation White	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Population estimates (weighted and rounded Ms)	30,245	15,940	3,385	7,130	1,975	2,1235	285,910	2,362,880								
Generational status (%)	100	100	100	100	100	100	100	100								
1.5 Generation	41	52	83	44	19	70	23	—								
Second generation	59	48	17	56	81	30	77	—								
Third-plus generation	NA	NA	NA	NA	NA	NA	—	89								
Sex (%)	100	100	100	100	100	100	100	100								
Female	48	47	48	48	50	47	48	49								
Male	52	53	52	52	50	53	52	51								
Average age (years)	32	30	29	32	32	31	33	32								
Marital status (%)	100	100	100	100	100	100	100	100								
Married, incl. common law	46	39	28	42	50	46	62	63								
Single	52	59	70	57	48	49	34	32								
Other	3	2	1	1	2	5	4	4								
Place of residence (CMA; %)	100	100	100	100	100	100	100	100								
Montreal	5	2	4	3	2	16	14	15								
Toronto	38	50	30	58	30	35	40	9								
Calgary	8	6	2	4	9	9	4	5								
Edmonton	5	5	2	3	3	6	3	5								
Vancouver	33	30	55	21	44	16	7	5								
Other CMAs	11	8	7	10	12	18	33	62								
Language use (mother tongue; %)	100	100	100	100	100	100	100	100								
Non-English/French	67	66	85	54	61	77	41	0								
English and/or French	33	34	15	46	39	23	60	100								

(continued)

Table I. (continued)

		1.5 and second generations, both parents born in specified country															
		Chinese, People's Republic of China		Chinese, Hong Kong		Taiwan		South Korea		Japan		Viet Nam		1.5- and second-generation White		Third-plus generation White	
		1	2	3	4	5	6	7	8								
Educational level (%)		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<HS or HS, trade and apprenticeship degrees		20	12	12	16	24	35	37	45								
College and university (below bachelor's)		21	18	16	22	29	25	31	28								
Bachelor's degree and certificate or diploma (above bachelor's)		50	56	54	50	39	34	26	22								
Medical, dental, master's, and doctoral degrees		10	14	18	12	8	7	6	5								
Field of study of postsecondary degrees (%)		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Education		4	3	3	7	3	3	7	7								
Arts, communication technology, and humanities		11	11	14	18	20	7	11	10								
Social and behavioral sciences and law		13	13	16	18	18	11	15	12								
Business, management, and public administration		27	27	23	21	21	29	23	20								
STEM and architecture		31	31	30	23	20	33	25	27								
Health and related fields		11	11	11	9	14	12	10	14								
Other		3	3	2	3	5	5	8	10								
Experienced labor force status (%)		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Not in the experienced labor force		7	5	13	9	9	9	8	8								
In the experienced labor force		93	95	87	91	91	91	92	92								
Wage earner status* (%)		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Not in the earning equation		10	8	16	12	12	12	11	10								
In the earning equation		90	92	84	88	88	88	90	90								
Mean log weekly 2010 earnings ^b		6.78	6.80	6.59	6.77	6.72	6.68	6.72	6.66								
Mean actual weekly 2010 earnings ^b		1,256	1,248	1,026	1,264	1,190	1,111	1,162	1,075								

Note. CMA = Census Metropolitan Area; HS = high school; STEM = science, technology, engineering, and mathematics. Statistics Canada (2012) Research Data Center National Household Survey Masterfile.

*Based on the population used in Heckman models for weekly earnings (exclude people who worked 1 or more weeks but had negative/zero earnings). ^bBased on the population with positive earnings, worked 1 or more weeks in 2010.

annual ACS did not collect this information and only does so for the bachelor's degree, not the highest postsecondary degree.

As demonstrated in countless studies of industrial and postindustrial societies, education is strongly linked to the occupations and earnings of individuals. The dominant interpretation is that education is a form of human capital, enhancing productivity and positioning individuals in the labor market. But as noted by Di Stasio, Bol, and Van de Werfhorst (2015), education also signals potential productivity; by creating hiring queues, employers place those with higher education ahead of those with less. Furthermore, education can indicate credentials, whereby individuals are allocated to select occupations according to educational content and training (Di Stasio et al., 2015). Under the credentialism explanation for the importance of education in the labor market, field of study has direct links to specific occupations, including the professions.

Our study selects professional occupations as an indicator of labor market achievement. From its inception, the defining characteristics of "professions" include the possession of an expert knowledge, high degrees of autonomy, and high rewards in social status and earnings (Abbott, 1988; Gorman & Sandefur, 2011; Larson, 1977). In today's meritorious society, professional occupations frequently denote types of work requiring higher education (Gorman & Sandefur, 2011). This criterion is used in Statistics Canada's (2012) classification of professional occupations which typically require university degrees. Furthermore, professional occupations are frequently used as a measure of social standing and may be positively viewed by immigrant parents. Research on Chinese offspring in the United States finds professional occupations are viewed as desirable by parents who adopt an instrumental orientation to education (Zhou, 2014); a 2004 in-depth study of Chinese and Vietnamese 1.5 and second generations in Los Angeles similarly reports strong parental emphasis on their children working in a narrow range of professional occupations, notably medicine, engineering, science, and law (Lee & Zhou, 2015). So too Xie and Goyette's (2003) investigation of the educational choices of Asian American youth finds they consciously choose fields that map onto science, technology, and professional occupations with high earnings and where marketable credentials minimize discrimination.

Following Statistics Canada's classification, professional occupations are in business and finance, natural and applied sciences, health including nursing, education services, law and social, community and government services, and art and culture (National Occupational Classification Categories 11, 21, 30-31, 40-41, and 50). The summary indicator, working in a professional occupation—yes/no—is a binary dependent variable for which either logistic regression or probit multivariate techniques are appropriate. To correct for any selection effects and to generate estimates that include those currently without occupations, we use probit analysis, following a procedure available in STATA routines. The underlying methodology is described by Heckman (1976) and others (Greene, 2003; Van de Ven & Van Praag, 1981). The generic form of correcting for selection effects as a result of omitting a subpopulation is to first model the inclusion of those with no occupations to report in 2010 or 2011 into the population reporting occupations. Then, estimates of work in professional occupations

are calculated for the entire population, taking other factors (including those not in the labor force) into account. To facilitate interpretation, these estimates are transformed into probabilities and multiplied by 100. The calculated numbers represent chances out of 100 of holding jobs in professional occupations for each East Asian group, based on two assumptions: All groups have occupations; all groups have identical distributions of demographic and educational characteristics.

Weekly wage, salary, and self-employment earnings are analyzed for those in the three generation groups who are aged 25 to 39 years. Unlike U.S. studies, hourly wages are not considered; the question on hours worked refers to the week before data collection in May 2011, and earnings data are collected for 2010 only. We analyze only weekly positive earnings, because in the earnings determination model, earnings are transformed into logged (ln) earning to reduce the effects of skewed distributions and outliers. Less than 3% of all total wage, salary, and self-employment earnings in 2010 are either negative or zero. To be included in the earnings analysis, respondents must have worked at least 1 week in 2010. Since earnings are expressed in logged (ln) dollar amounts and represent interval data, ordinary least squares regression analysis can be used. However, as in the analysis of professional occupations, the multivariate earnings model corrects for selection effects, following the Heckman routine in Stata. Finally, the semilogged regression coefficients for generation groups are transformed into percentage deviations (Halvorsen & Palmquist, 1980).

All the occupational and earnings multivariate analyses begin with the unadjusted (or “gross”) difference between groups (Model 1). Subsequent models adjust for compositional differences between origin and generation groups. Model 2 displays differences that would be observed if all groups had the same distributions in sex composition, age, marital status, place of residence, and language use; Model 3 indicates differences that would remain if all groups had the same distributions in highest level of education attained and fields of study. Following Sakamoto and Woo (2007), occupational characteristics are not part of the wage determination modeling; not only are occupations considered endogenous to the earnings function by many economists but their inclusion “overcontrols.” If occupations are omitted, group earnings differentials partially reflect the effects of earlier observed differences between groups in the selection or allocation of occupations. If occupations are included in earnings determination models, the analysis captures group differentials in earnings within occupations.

In the analyses of both occupational outcome (the likelihood of working in professional occupations) and weekly earnings, third-plus generation Whites are the reference group to which East Asian origin groups are compared. This reference group is largely of British and French origins (over 60%), reflecting the early settlement history of Canada. We acknowledge taking an orthodox approach to the selection of the White third-plus generation; recent qualitative studies using subject-centered approaches find Asian children of immigrants are more concerned about their relative achievements vis-à-vis other Asian groups than compared with the White population (Jiménez & Horowitz, 2013; Lee & Zhou, 2015). However, from a stratification perspective, it is appropriate to compare the location of the 1.5 and the second generation in occupational and earnings hierarchies with those of the numerically and historically dominant White third-plus generation.

Our multivariate analyses use 2011 NHS data housed in federally and university-funded research data centers; analysts are granted access only for vetted and approved research proposals. Subsequent release of analytical results must meet Statistics Canada generated criteria that assure confidentiality for survey respondents and censuses housed in the research data centers. Under these guidelines, univariate and cross-tabular data releases require forward-looking thought, as refusal can occur when the population of interest is altered or when new subprojects are added.

Demographic and Educational Characteristics of the Children of East Asian Immigrants

Reflecting parental migration timing and characteristics, there is much diversity among the children of immigrants from East Asian countries (Paik et al., 2014). In the population of interest (aged 25 to 39 years, not attending school and living in CMAs), strong demographic variations exist in size, generational status, marital status, location of residence, and mother tongue (language first spoken and still understood). As shown in Table 1, the largest numbers represent those whose parents were born in PRC, Hong Kong, and Vietnam. The population of offspring with origins in South Korea, Taiwan, and Japan is much smaller. Those with parents born in Taiwan and Vietnam are the most likely to be 1.5 generation (83% and 77%, respectively); those with parents born in Japan stand at 19%.

Because of the data release requirements for tabular data, the remainder of Table 1 combines the 1.5 and second generation; these generations remain separated in the multivariate analyses. (Our decisions do not rest on problematic numbers or data quality issues but derive from the need to protect the ability to get additional data released for related projects.) The generational statuses of East Asian groups in Table 1 help explain, albeit imperfectly, variations among the groups in marital status; those Chinese offspring with parents born in Taiwan are youngest, on average, and are most likely (70%) to be single. Similarly, the impact of generational status can be seen in variations in the percentages whose mother tongue(s) as/are English and/or French or another language. Finally, the strong pull of Canada's two magnet cities (Toronto and Vancouver) for East Asian origin parents and their children can be seen in the very high proportions who reside there. Among the East Asian 1.5 and second generations, only the Vietnamese are likely to live in Montreal (after Toronto and Vancouver); this pattern may reflect the colonial French history of Vietnam and the country's use of French.

The highest percentages with university degrees or beyond are the children of immigrants who identify racially as Chinese and whose parents are born in PRC, Hong Kong, or Taiwan, along with those whose parents are born in South Korea. In contrast, university attainment is lower for those whose parents are born in Japan or Vietnam and lower still for the White 1.5, second and third-plus generations. Although emphasis is given to the East Asian population, the 1.5 and second White generations are included to determine if the multivariate analysis produces unique results for East Asian children of immigrants.

Variations similar to those for levels of education exist among the groups in their major fields of study (asked of those with education beyond high school). Persons declaring themselves Chinese with both parents born in PRC, Hong Kong, or Taiwan are the most likely to have studied business, management, public administration, science, technology, engineering, and mathematical (STEM) fields, with substantially lower percentages for the White 1.5, second and third-plus generations. STEM and business fields yield high returns in terms of occupational attainment and earnings, and many professional occupations draw from these majors.

Working in Professional Occupations

Descriptive data indicate East Asian children of immigrants in Canada have higher educational levels and greater concentrations in STEM and business fields of study than the White third-plus generation (and the White 1.5 and second generations). To what extent do these better educational profiles translate into higher chances of working in professional occupations? Do the chances vary by generational status or parental origins? Probit regressions with Heckman correction for sample selection bias (using the Heckprobit procedure in Stata 13) indicate educational profiles largely explain the higher chances of working in professional occupations for all 1.5 generation groups and for most of the second-generation groups.

As discussed in the Data and Method section, three models predict the likelihoods of working in professional occupations, progressively adjusting for group differences in demographic factors and educational characteristics. All coefficients from these regressions are found in Appendix A1. For ease of interpretation, predicted probabilities for all the original and generational groups are calculated using the margins procedure in Stata 13 by setting all other variables at their means. Table 2 presents these predicted probabilities as chances out of 100 of working in professional occupations; significance levels indicate if the underlying regression coefficients are different from the White third-plus generation (Appendix A1).

Children of East Asian immigrants have higher chances of working in professional occupations than the White third-plus generation after taking into account characteristics of those not in the experienced labor force (Table 2, Model 1; Excluding those with parents born in Taiwan, fewer than 10% of immigrant children did not work in the 14 months before the May 14 fielding of the NHS.) All 1.5- and second-generation East Asian groups (except for the 1.5-generation Japanese) have significantly higher chances of working in professional occupations than the White third-plus generation (3-29 percentage points).

Two patterns of variation within East Asian groups are evident. First, those with parents born in Taiwan and Hong Kong have the highest chances of working in professional occupations, followed by those with parents born in PRC and South Korea; groups where parents originate from Japan and Vietnam are at the lower end. Second, for each source country, the second generation has higher chances of working in professional occupations than the 1.5 generation. For example, among those with parents born in Taiwan, the chances of working in professional occupations are 57.0% for the

Table 2. Chances Out of 100 of Working in Professional Occupations for Select East Asian Groups and the White Population, by Generational Status, Aged 25 to 39 Years, Living in CMAs, Not Attending School, Canada, 2011.

	Unadjusted		Net of demographic		Net of demographic, education level, and field of study	
	Model 1		Model 2		Model 3	
	1		2		3	
	Predicted probability ^a	Sig. ^b	Predicted probability ^a	Sig. ^b	Predicted probability ^a	Sig. ^b
<i>Parental birthplace and generational groups</i>						
People's Republic of China, 1.5 generation	36.5	***	35.7	***	14.5	ns
Hong Kong, 1.5 generation	44.2	***	44.0	***	16.6	ns
Taiwan, 1.5 generation	41.5	***	42.5	***	14.2	ns
South Korea, 1.5 generation	37.2	***	36.0	***	13.1	ns
Japan, 1.5 generation	33.1	ns	32.0	ns	12.9	ns
Vietnam, 1.5 generation	31.5	***	30.6	**	16.5	ns
White, 1.5 generation	29.8	***	29.6	*	15.8	ns
People's Republic of China, second generation	41.4	***	40.5	***	16.5	ns
Hong Kong, second generation	48.5	***	47.8	***	19.6	***
Taiwan, second generation	57.0	***	56.6	***	28.5	*
South Korea, second generation	41.2	***	39.1	***	15.9	ns
Japan, second generation	34.6	*	33.6	*	16.3	ns
Vietnam, second generation	37.3	***	38.0	***	16.9	ns
White, second generation	29.0	***	27.9	ns	14.5	**
White, third-plus generation	28.1	(rg)	28.2	(rg)	15.3	(rg)

Note. The source is Appendix A1.

^aPredicted probabilities are obtained using the margins command in STATA and setting all other covariates at their means. ^bSignificance levels are in reference to the White third-plus generation, based on Heckprobit models in Table 3.

second generation compared with 41.5% for the 1.5 generation. Relative to the White third-plus generation, the White 1.5 and second generations are slightly more likely to hold professional occupations, although the gaps are smaller than in East Asian groups.

These patterns remain after adjusting for group differences in demographic characteristics (Table 2, Model 2). In fact, compositional differences in demographic factors between groups do not have strong effects on the chances of professional occupations. The pattern of significance levels in Model 2 (Table 2 and Appendix A1) remains similar to the base model; the magnitudes of differences are reduced only slightly for all 12

Asian-origin 1.5- and second-generation groups compared with the third-plus generation White group. However, educational attainments are important predictors of occupational attainment, measured as working in professional occupations. When the analysis adjusts for compositional differences in educational levels and fields of study (Appendix A1, Model 3), results show that if all groups had the same distributions for these two educational characteristics, the differential chances of working in professional occupations between most of the 1.5- and second-generation East Asian groups and the White third-plus generation would substantially reduce and cease to be statistically significant (Table 2, Model 3). Stated differently, the higher chances of children of East Asian immigrants of working in professional occupations reflect their better educational profiles, including their higher educational levels and particular fields of study (see Table 1).

That said, variations do exist within the East Asian–origin population. For both the White and the 1.5-generation Asian-origin groups, a better educational profile underlies a better chance of working in a professional occupation (Table 2, Model 3). However, even if all groups had the same distributions on educational characteristics, the second generation with parents from Hong Kong and Taiwan would continue to have higher predicted chances of working in professional occupations than the White third-plus generation by 4 and 13 percentage points, respectively (Table 2, Model 3). For the remaining East Asian children of immigrants, the likelihoods of working in a professional occupation are not statistically different from the White third-plus generation. Interestingly, without their slightly better educational profile, the White second generation actually would have less chance of holding a professional occupation (Table 2, column 3).

Earnings of Children of East Asian Immigrants

Earnings are an integral part of making a livelihood in monetarized societies; work-related income enhances access to health care, home ownership, consumption, and savings, to name a few. What are the earnings achievements of children of East Asian immigrants compared with the White third-plus generation and what roles are played by compositional differences among groups? Appendix A2 shows the full results from ordinary least squares regressions predicting natural logarithm transformed weekly earnings in 2010. Again using the Heckman procedure, the models correct for sample selection into working 1 or more weeks in 2010 and receiving positive earnings. As with the occupational models, the earnings models adjust step-by-step demographic factors and educational characteristics to assess the impact of each cluster of variables on the earnings disparities between various 1.5- and second-generation East Asian groups and the White third-plus generation. For easier interpretation, Table 3 expresses regression results as percent differences in weekly earnings relative to the White third-plus generation.

Differential earnings across generations and source countries are evident in the base model (Model 1 in Table 3 and Appendix A2). For the 1.5-generation East Asian groups, compared with the third-plus generation Whites, those with parents born in Hong Kong have 5.6% higher weekly earnings; those with parents born in PRC, South Korea, Japan, and Vietnam have comparable earnings, but those with parents born in

Table 3. Percentage Point Differences in Weekly Earnings for East Asian Groups and the White Population, by Generational Status, Relative to the White Third-Plus Generation, Aged 25 to 39 Years, Not Attending School, Living in CMAs, Canada, 2011.

Parental birthplace and generational groups	Model 1 ^a	Model 2 ^b	Model 3 ^c
	1	2	3
People's Republic of China, 1.5 generation	<i>ns</i>	<i>ns</i>	-11.7
Hong Kong, 1.5 generation	5.6	8.6	-8.0
Taiwan, 1.5 generation	-15.2	<i>ns</i>	-21.6
South Korea, 1.5 generation	<i>ns</i>	<i>ns</i>	<i>ns</i>
Japan, 1.5 generation	<i>ns</i>	<i>ns</i>	<i>ns</i>
Vietnam, 1.5 generation	<i>ns</i>	<i>ns</i>	-8.2
White, 1.5 generation	2.4	<i>ns</i>	<i>ns</i>
People's Republic of China, second generation	14.6	10.3	<i>ns</i>
Hong Kong, second generation	17.8	15.6	<i>ns</i>
Taiwan, second generation	24.7	20.9	<i>ns</i>
South Korea, second generation	16.1	9.9	<i>ns</i>
Japan, second generation	<i>ns</i>	<i>ns</i>	<i>ns</i>
Vietnam, second generation	<i>ns</i>	8.2	<i>ns</i>
White, second generation	6.5	<i>ns</i>	<i>ns</i>
White, third-plus generation	(rg)	(rg)	(rg)

Note. CMA = Census Metropolitan Area; The source is Appendix A1.

^aGross effects, no controls. ^bControlling for age, sex, marital status, place of residence, and mother tongue.

^cControlling for variables listed in Footnote b and for highest level of education and field of study.

Taiwan earn about 15% less. In contrast, all six second-generation East Asian groups have significantly higher or comparable earnings relative to the White third-plus generation. Specifically, Canadian-born children of immigrants from Hong Kong, Taiwan, PRC, and South Korea have earnings advantages over the third-plus generation Whites by between 14% and 25%, while the second-generation Japanese and Vietnamese have earnings that on average do not differ from the White third-plus generation.

Even if all groups had the same distributions on demographic factors, earnings advantages and disadvantages over the White third-plus generation would persist for most East Asian groups (Model 2 in Table 3 and Appendix A2), with two notable exceptions: the 1.5 generation Taiwanese and second generation Vietnamese. After adjusting for compositional differences in demographic characteristics, the earnings penalties in Model 1 become nonsignificant in Model 2 for the Taiwanese 1.5 generation who now have earnings levels comparable with the White third-plus generation. Meanwhile, the Vietnamese second generation now has significantly higher earnings than the White third-plus generation (comparing Model 2 and Model 1, Table 3). These changes suggest the two groups have one or more unfavorable demographic characteristics that lower their earnings relative to the distributions of the overall population. For example, the children of Taiwanese parents, on average, are younger, are

more likely to be single, and do not speak English and/or French as mother tongues, all factors associated with lower weekly earnings (Appendix A2, Model 2). By comparison, the slightly higher earning of the White 1.5 and second generations reflect their more favorable demographic profiles; notably, they are more likely to be married and to have English and/or French as their mother tongues.

Paralleling the findings for professional occupations, educational accomplishments are very important for the earnings achievements of children of East Asian immigrants. Compared with the White third-plus generation, higher proportions have a bachelor's degree or greater, and they concentrate in business and STEM fields of study (Table 1). Returns to these educational characteristics are among the largest in the earnings determination model (Appendix A2, Model 3). In short, without their better educational profiles, the second-generation East Asian groups would no longer have significant earnings advantages relative to the White third-plus generation (Table 3, Model 3). Moreover, when compositional differences in educational profiles are taken into account, the 1.5-generation groups with parents born in PRC, Hong Kong, Taiwan, and Vietnam would actually have significantly lower weekly earnings than the White third-plus generation, down by 8% to 22%. In other words, for these four groups, their better educational profiles have masked factors that would otherwise penalize their earnings.

Conclusion

American research pays considerable attention to the educational achievements of the Asian-origin population. Studies observe that compared with the White American born, on average, the Asian American born as a group and Asian-origin groups such as those of Chinese, Korean, Japanese, and Vietnamese origins have higher levels of education attainment (Rothon, Heath, & Lessard-Phillips, 2009; Sakamoto & Woo, 2007; Sakamoto, Takei, & Woo, 2011; Takei et al., 2013; Takei & Sakamoto, 2009; Yang, 2011). In addition to influences exerted by family of origin characteristics, such as parental education and family structure, on test scores and university degrees, investigations note such additional factors as parental aspirations for their children, bringing honor to the family, speaking the origin language at home but the destination country language elsewhere, working hard, using bridging language schools or special preparatory schools, and having ethnic community resources (Chen & Fouad, 2013; Jerrim, 2015; Lee & Zhou, 2015; Paik et al., 2014; Pong & Landale, 2012; Sakamoto et al., 2009; Zhang, 2014; Zhou, 2014).

Reflecting the importance of East Asia as a source region, our study explicitly examines the achievements of the Canadian 1.5 and second generations of East Asian descent, focusing on three Chinese-origin groups (PRC, Hong Kong, and Taiwan), and those with origins in South Korea, Japan, and Vietnam. Analyses of the 2011 NHS confirm the high educational attainments of these groups and extend the achievement story to labor market success. Compared with the White third-plus generation, all six origin groups have higher percentages attaining university degrees and higher, and they are more likely to have postsecondary school majors in business and in

engineering. Consistent with the findings of two U.S. investigations of the American born (Sakamoto & Woo, 2007; Yang, 2011), these groups have higher percentages in professional occupations.

Given the high educational profiles of the six Asian 1.5- and second-generation offspring, it is not surprising to find education underlies the two indicators of labor market integration: professional occupations and weekly earnings. These measures are different indicators of economic standing and do not necessarily produce the same results; however, for each, education plays important roles. Once the higher educational attainments (defined as highest level of education and postsecondary major field of study) are taken into account, we find no significant differences between the East Asian 1.5-generation groups and the White third-plus generation in holding professional occupations. We find similar results for the second generation, with the exception of those with parents born in Hong Kong and in Taiwan who continue to have higher percentages employed in professional occupations. For earnings, we find that once group-specific educational profiles are taken into account, no significant earnings differentials exist between the six second-generation East Asian groups and the White third-plus generation. However, among the 1.5 generation, adjusting for higher educational profiles tells a different story: Compared with the earnings of the White third-plus generation, those with parents born in PRC, Hong Kong, Taiwan, and Vietnam, on average, now have lower weekly earnings.

These results speak to the two core stratification perspectives guiding research on Asian Americans: The equality of opportunity framing of inequalities where unequal outcomes reflect compositional differences among subpopulations, and the majority–minority perspective where inequalities persist, with discrimination the likely culprit. The latter perspective resonates with depictions of Asian American as a model minority whose successes can be explained by their overeducation compared with a White majority; minorities reach economic parity with Whites only because they have higher education which compensates and masks unfavorable labor market outcomes.

Overall, our analytical results support the first stratification perspective rather than the second. Educational advantage exists and is an important factor underlying the higher proportions of the children of East Asian immigrants found in professional occupations and their higher earnings. The findings are particularly evident for second-generation East Asians where adjusting for compositional factors, especially educational levels and fields of study, does not produce occupational or earnings disadvantages relative to third-plus generation Whites. Stated differently, with one important proviso, our findings do not support the overeducation model. The only exception occurs for the 1.5 generation where similar educational profiles would elicit lower earnings for Chinese and Vietnamese than for the White third-plus generation. We have no compelling explanation for such findings regarding earnings; it could reflect the omission in the analysis of other factors, including later age of arrival or it could signal a process of disadvantage that might, or might not, persist as the 1.5 generation becomes older. Future studies will help assess the robustness of this particular finding.

Appendix A I

Coefficients From Probit Regressions of Working in a Professional Occupation With Heckman Sample Selection, for Select East Asian Groups and the White Population, by Generational Status, Aged 25 to 39 Years, Living in CMAs, Not Attending School, Canada, 2011.

	Unadjusted		Net of demographic		Net of demographic, education level, and field of study	
	Model 1		Model 2		Model 3	
	1		2		3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Parental birthplace and generational groups						
People's Republic of China, 1.5 generation	0.232	***	0.210	***	-0.034	ns
Hong Kong, 1.5 generation	0.434	***	0.425	***	0.054	ns
Taiwan, 1.5 generation	0.363	***	0.387	***	-0.047	ns
South Korea, 1.5 generation	0.251	***	0.216	***	-0.095	ns
Japan, 1.5 generation	0.140	ns	0.107	ns	-0.107	ns
Vietnam, 1.5 generation	0.098	***	0.070	*	0.050	ns
White, 1.5 generation	0.049	***	0.039	**	0.021	ns
People's Republic of China, second generation	0.362	***	0.336	***	0.049	ns
Hong Kong, second generation	0.542	***	0.521	***	0.169	***
Taiwan, second generation	0.756	***	0.743	***	0.455	*
South Korea, second generation	0.355	***	0.298	***	0.026	ns
Japan, second generation	0.183	*	0.154	*	0.041	ns
Vietnam, second generation	0.254	***	0.271	***	0.064	ns
White, second generation	0.025	***	-0.009	ns	-0.035	**
White, third-plus generation	(rg)		(rg)		(rg)	
Sex						
Men			(rg)		(rg)	
Women			0.177	***	0.073	***
Age			0.119	***	0.141	***
Age squared/100			-0.168	***	-0.215	***
Marital status						
Married			(rg)		(rg)	
Single			-0.022	***	-0.037	***
Other			-0.067	***	-0.057	**
Place of residence (CMA)						
Toronto			(rg)		(rg)	
Montreal			-0.057	***	0.058	***
Calgary			-0.020	ns	0.041	*
Edmonton			-0.128	***	-0.070	***
Vancouver			-0.081	***	-0.052	***
Other CMAs			-0.139	***	-0.071	***

(continued)

Appendix A1 (continued)

	Unadjusted		Net of demographic		Net of demographic, education level, and field of study	
	Model 1		Model 2		Model 3	
	1		2		3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Language use (mother tongue)						
Non-English/French			(rg)		(rg)	
English and/or French			0.026	*	0.030	ns
Educational level					(rg)	
<HS or HS, trade, and apprenticeship degrees						
College					0.829	***
Bachelor's degree and certificate or diploma (above bachelor's)					1.952	***
Medical, dental, master's, and doctoral degrees					2.423	***
Fields of study						
HS degree and below					(rg)	
Education					0.563	***
Arts, communication technology, and humanities					-0.432	***
Social and behavioral sciences and law					-0.385	***
Business, management, and public administration					-0.326	***
STEM and architecture					-0.032	ns
Health and related fields					0.212	***
Other					-0.652	***
Constant	-0.579	***	-2.641	***	-4.020	***
Selection equation: worked in 2010 or 2011						
Age	-0.005	***	-0.014	***	-0.020	***
Have college and above education	1.108	***	1.063	***	0.591	***
Married	0.179	***	0.170	***	0.427	***
Number of children aged 0-5 years	-0.097	***	-0.113	***	-0.259	***
Constant	0.866	***	1.214	***	1.670	***
Log pseudolikelihood	-1913741		-1898106		-1605902	
ρ	-0.997		-0.995		-0.259	
$(\rho = 0): \chi^2$	9978.92	***	11422.28	***	72.87	***

Note. CMA = Census Metropolitan Area; ns = not significant at $p = .05$ level. The source is Statistics Canada (2012) National Household Survey Masterfile housed at the Research Data Center.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Appendix A2

Coefficients From Heckman Weekly Earnings Determination Models for Select East Asian Groups and the White Population, by Generational Status, Aged 25 to 39 Years, Living in CMAs, Not Attending School, Canada, 2011 NHS.

	Unadjusted		Net of demographic		Net of demographic, education level, and field of study	
	Model 1		Model 2		Model 3	
	1		2		3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Parental birthplace and generational groups						
People's Republic of China, 1.5 generation	0.019	<i>ns</i>	-0.006	<i>ns</i>	-0.125	***
Hong Kong, 1.5 generation	0.055	*	0.082	**	-0.083	**
Taiwan, 1.5 generation	-0.165	***	-0.073	<i>ns</i>	-0.244	***
South Korea, 1.5 generation	0.031	<i>ns</i>	0.015	<i>ns</i>	-0.094	<i>ns</i>
Japan, 1.5 generation	0.032	<i>ns</i>	-0.017	<i>ns</i>	-0.021	<i>ns</i>
Vietnam, 1.5 generation	0.010	<i>ns</i>	-0.042	<i>ns</i>	-0.086	***
White, 1.5 generation	0.024	*	-0.002	<i>ns</i>	-0.016	<i>ns</i>
People's Republic of China, second generation	0.136	***	0.098	***	-0.028	<i>ns</i>
Hong Kong, second generation	0.164	***	0.145	***	-0.018	<i>ns</i>
Taiwan, second generation	0.221	*	0.190	*	0.008	<i>ns</i>
South Korea, second generation	0.150	***	0.094	*	-0.002	<i>ns</i>
Japan, second generation	0.081	<i>ns</i>	0.032	<i>ns</i>	-0.015	<i>ns</i>
Vietnam, second generation	-0.005	<i>ns</i>	0.079	*	-0.029	<i>ns</i>
White, second generation	0.063	***	0.001	<i>ns</i>	-0.001	<i>ns</i>
White, third-plus generation	(rg)		(rg)		(rg)	
Sex						
Men			(rg)		(rg)	
Women			-0.302	***	-0.328	***
Age						
Age squared/100			0.129	***	0.110	***
Marital status						
Married			(rg)		(rg)	
Single			-0.110	***	-0.081	***
Other			-0.048	***	0.006	<i>ns</i>
Place of residence (CMA)						
Toronto			(rg)		(rg)	
Montreal			-0.145	***	-0.132	***
Calgary			0.144	***	0.142	***
Edmonton			0.102	***	0.129	***
Vancouver			-0.050	***	-0.023	**
Other CMAs			-0.136	***	-0.105	***
Language use (mother tongue)						
Non-English/French			(rg)		(rg)	
English and/or French			0.015	<i>ns</i>	0.014	<i>ns</i>

(continued)

Appendix A2 (continued)

	Unadjusted		Net of demographic		Net of demographic, education level, and field of study	
	Model 1		Model 2		Model 3	
	1		2		3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Educational level						
<HS or HS, trade, and apprenticeship degrees					(rg)	
College					0.044	***
Bachelor's degree and certificate or diploma (above bachelor's)					0.346	***
Medical, dental, master's, and doctoral degrees					0.499	***
Fields of study						
HS degree and below					(rg)	
Education					0.037	***
Arts, communication technology, and humanities					-0.146	***
Social and behavioral sciences and law					0.025	**
Business, management, and public administration					0.129	***
STEM and architecture					0.202	***
Health and related fields					0.154	***
Other					0.052	***
Constant	6.803	***	4.570	***	4.678	***
Selection equation: worked 1 or more weeks, had positive earnings in 2010						
Age	0.008	***	-0.012	***	-0.012	***
Have college and above education	0.557	***	0.616	***	0.441	***
Married	0.360	***	0.287	***	0.317	***
Number of children aged 0-5 years	-0.146	***	-0.154	***	-0.167	***
Constant	0.514	***	1.166	***	1.279	***
Log pseudolikelihood	-3782849		-3705204		-3640549	
λ	-0.775		-0.747		-0.698	
$(p = 0): \chi^2$	12647.21	***	11766.35	***	8755.98	***

Note. CMA = Census Metropolitan Area; HS = high school; STEM = science, technology, engineering, and mathematics; NHS = National Household Survey. *ns* = not significant at $p = .05$ level. The source is Statistics Canada (2012) National Household Survey Masterfile housed at the Research Data Center.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

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