

Bruce Garnett

Maria Adamuti-Trache

and

Charles Ungerleider

University of British Columbia

The Academic Mobility of Students for Whom English is Not a First Language: The Roles of Ethnicity, Language, and Class

This study uses extant data to examine the roles of ethnicity, social class, and linguistic proficiency in predicting the participation and performance of students for whom English is not a first language (ENFL) from the class of 2002 in a provincially examinable grade 12 subject areas in a large urban British Columbia school district (n=4,075). Descriptive statistics show similar performance levels, but variable participation rates among ENFL and native English-speaking (NES) baseline students. However, these results mask differences between ethnolinguistic subgroups of ENFL students. Linear and logistic regressions show that although social class and linguistic proficiency significantly affect outcomes, participation and performance advantages to Chinese- and Korean-speaking students over their ENFL and NES peers hold across the sciences. Smaller performance advantages to Chinese speakers hold across the humanities.

Cette étude puise dans des données d'examens provinciaux de la 12^e année de 4 075 élèves en 2002 pour examiner les rôles que jouent l'ethnicité, la classe sociale et la compétence linguistique comme prédicteurs de la participation et la performance d'élèves dont l'anglais n'est pas la langue maternelle (ENFL) et provenant d'un grand district scolaire en Colombie britannique. Les statistiques descriptives ont révélé des performances similaires, mais des taux de participation différents, pour les élèves dont l'anglais n'est pas la langue maternelle et les élèves témoins anglophones. Toutefois, ces statistiques masquent les différences entre les sous-groupes ethnolinguistiques des élèves ENFL. Des régressions linéaires et logistiques ont révélé que si la classe sociale et la compétence linguistique affectent légèrement les résultats, la supériorité en matière de participation et de performance chez les élèves d'expression chinoise et coréenne par rapport à leurs pairs anglophones est constante pour les sciences. Les élèves d'expression chinoise ont également démontré une supériorité, moins grande, dans leur performance en lettres et sciences humaines.

Bruce Garnett is a teacher of ESL students in the Surrey School District in British Columbia. His research focuses chiefly on the academic trajectories of immigrant students and K-12 educational policy.

Maria Adamuti-Trache is research manager with Edudata Canada and a statistical consultant in the Faculty of Education.

Charles Ungerleider is professor of sociology of education and Director of research and knowledge mobilization at the Canadian Council on Learning.

Introduction

Equal opportunity is the fundamental promise of liberal democratic societies. If multicultural policy in pluralist countries like Canada is to be meaningful, we have a particular obligation to ensure that opportunities extend to immigrant citizens and their children; fair opportunity for all social groups is a necessary component of Cummins' (2000) proposal to move from coercive to collaborative power relations in society. Given that school is widely and historically recognized as the mediator of labor market opportunities and life chances, the schooling outcomes of students for whom English is not a first language (ENFL students) demand examination. We choose this label rather than ESL because enrollment in an ESL program is long past for many of these grade 12 students.

This article capitalizes on the data available to explore the equality of educational outcomes of diverse subsets of ENFL students. It is hypothesized that a number of factors will affect the outcomes of ENFL students including the sociocultural experience of immigration, the role of ethnic community values, their socioeconomic standing, and the degree to which they are able to use English across subject areas. Various ethnolinguistic subsets of immigrant ENFL students' outcomes are measured against each other and against a baseline provided by native English speakers (NES).

Theoretical Perspectives

Sociocultural Theories

Ogbu's (1992) well-known sociocultural theory of minority achievement (Ogbu & Simons, 1998) posits that "community forces" internal to distinct minority groups along with external "ecological" forces account for the varying educational outcomes of minority groups in the same environment. Crucially, community forces act differently between voluntary and involuntary minorities. Voluntary minorities, immigrants, have cultural models that uncritically accept folk theories of upward mobility in the new society; hardships are temporary obstacles, removable through education and hard work. Accordingly, they are willing to acquiesce and trust in mainstream (White) institutions to help them fulfill their aspirations. The cultural and language differences they see—their frames of reference—are mere barriers to be overcome, and they make concerted efforts to do so. Generally, they believe that more opportunities exist in the host society than in the old one.

By contrast, involuntary minorities, colonized peoples, suspect that hard work and education contribute little to their mobility in a racist society and are consequently distrustful of White institutions and their personnel. Cultural and language differences between themselves and the mainstream are not obstacles to overcome, but markers of identity to be maintained. Moreover, they compare their opportunities with those of the White middle class, not with those that they had at home. Attitudes toward schooling may be anti-success.

Ogbu's (1992) model is a heuristic tool. Both types of minority have culturally patterned educational strategies that can lead either to success or to failure. However, voluntary minorities have a wider range of successful strategies from which to choose; thus their dominant pattern is one of success whereas the inverse is true for involuntary minorities.

Empirically, Samuel, Krugly-Smolka, and Warren (2001) find evidence supporting Ogbu's (1992) theory in the Canadian context. The voluntary immigrants in their study from five major immigrant groups excel academically despite barriers of language and racial discrimination; however, socioeconomic status (SES) is not accounted for in the study. Nonetheless, in the United States Kao (1995) shows that contrary to what Ogbu and Samuel et al. say, not all voluntary immigrant groups outperform Whites.

Another strand of theory explains immigrant achievement through values inherent in ethnic communities, apart from the immigrant experience. This explanation is most prominent in explaining the success of the so-called Asian "model minority" whose values are often thought to be docility, industriousness, respect for authority, and an emphasis on learning (Peng & Wright, 1994). Regarding a specific Asian subgroup, Chow (2004) comments on the "vitality of educational values and work orientation as an aspect of Chinese culture" (para. 1) and recognizes that education in the Chinese community is conceived of as an avenue of social, economic, and moral advancement. Accordingly, he asserts that ethnic capital, the degree of internalization of one's ethnic values and sense of connectedness to the ethnic community, helps account for high scores among Chinese students.

Some model minority researchers tread close to socioeconomic terrain, claiming that the cultural values listed above can be understood as a function of home environments with educated, intact two-parent families and extracurricular educational activities (Peng & Wright, 1994). Schneider and Lee (1990) find that Asian parents are more supportive of learning and provide more opportunities and pressures to learn for their children than other parents. Sue and Okazaki (1990) posit a theory of "relative functionalism," which states that Asian ethnic groups see educational achievement as the only way to overcome the racist barriers thrown up by society and thus stress its importance to their children. Nevertheless, Kao (1995) cautions against treating Asians as a homogeneous group and documents significant differences in attainments among various Asian subgroups.

Li (2001) provides qualitative evidence of the potential power of ethnicity, illustrating that "high Chinese parental expectations and children's striving for excellence are not only individually and psychologically driven, but largely a collective function of their family, community, and society at large" (p. 489). Furthermore, the families in her study prioritize the sciences because they believe that jobs dependent on the humanities such as law are effectively closed to their children due to discrimination, a finding reminiscent of Sue and Okazaki's (1990) relative functionalism (see also Kao, 1995).

Socioeconomic Theories

The positive correlation between SES and schooling outcomes may be the most enduring sociological research finding (Ma, 2002; White, 1982). The income level and education of an individual's family or neighborhood are the key components of SES (Haveman & Wolfe, 1994). Chow (2000) hypothesizes that simple access to financial resources provides tutors for the higher-achieving students in his sample, whereas low income leads to poor educational attainments by way of low birth weights, poor nutrition, poor housing and inadequate access to health care (Bradley & Corwyn, 2002) Regarding education

level, Bourdieu (1977; Bourdieu & Passeron, 1977) and his followers have long argued for the importance of middle- and upper-class cultural capital in predicting educational outcomes. Zady and Portes (2001) find that low-SES mothers employ less effective techniques in helping their children with science homework, for example. Conversely, Adamuti-Trache and Andres (in press) show that university-educated parents encourage enrollment in prestigious grade 12 science courses. Likelihood of graduation, years of schooling, and future economic inactivity among youth are further outcomes all correlated with family and neighborhood SES (Haveman & Wolfe).

The contemporary socioeconomics of immigration are elucidated in a theory of “segmented assimilation” (Portes & Rumbaut, 1990, pp. 216-221), a phenomenon that affects linguistic and academic attainments and social mobility. Unlike historical immigration patterns that followed an upward trajectory of social mobility over generations, economically disadvantaged immigrants remain stuck at the bottom of the social ladder for two reasons: they tend to settle in homogeneous ethnic neighborhoods with employment that provides little opportunity or necessity to learn the host language; and the labor-intensive manufacturing and growing personal service sectors of the new economy offer few upward channels of mobility (Portes & Zhou, 1993). Simultaneously, a class of economically advantaged immigrants is settling in prosperous heterogeneous communities where the need and opportunity to learn the host language is high. “In upscale middle-class suburbs, wealthy immigrants with ‘bags’ of monies buy up luxurious homes and move right in, jumping several steps ahead and bypassing the traditional bottom-up order” (Zhou, 1997, p. 979). Each immigrant group assimilates to a particular socioeconomic segment of society depending on the context (social, geographical, and political) into which they move and the resources they bring with them.

Language Acquisition and School Subjects

ENFL students’ academic learning depends on English language acquisition. Cummins (2000) hypothesizes that language tasks are more difficult to the degree that they are context-reduced as opposed to context-embedded, and cognitively demanding as opposed to cognitively undemanding. Academic language tends toward the former item of each distinction; typically, learners take five to seven years to achieve grade-level equivalency in academic language with native speakers (Collier, 1987, 1989; Cummins). Therefore, immigrants’ age of arrival and prior experiences with English mediate their eventual academic language proficiency, as does their first-language literacy (Cummins). Furthermore, the *critical period* hypothesis suggests that after certain ages, phonological and morphosyntactic ability in a second language may decrease, although the latter ability loss may be owing to variations in education and language use confounded with age on arrival rather than biological maturational effects (Flege, Yeni-Komshian, & Liu, 1999).

Various subject areas present varied linguistic and cultural demands on ESL learners. Mathematics and science should not be construed as only minimally language-dependent (Carrasquillo & Rodriguez, 2002; Chamot & O’Malley, 1994); however, some areas of mathematics are less reliant on language than other subjects, and science lends itself to linguistically context-embedded activity work such as demonstrations, observations, and experimentation. More-

over, most students have prior, if naïve, knowledge of scientific phenomena that crosses cultural boundaries (e.g., boiling water makes steam, Chamot & O'Malley) and *some* ESL students have prior, sometimes more extensive, school experiences in mathematics (Seror, 2002).

Such linguistic and cultural supports are rarer in the humanities. In social studies "language input is often decontextualized, dealing with abstract ideas and information removed in space and time from students' own experiences" (Chamot & O'Malley, 1994, p. 261). Similarly, "no area of the school curriculum is more closely linked to culture than literature" (p. 288) with its "overwhelming array of unfamiliar vocabulary" (p. 290). Duff (2001) agrees that ENFL students may lack the linguistic, cultural, and geographic knowledge needed to interpret social studies texts. Correspondingly, reticent ESL students may lack the cultural capital to participate and display knowledge in literature discussion (Early, 2003). Later entry into the school system entails disadvantages due to the cumulative nature of the social studies curriculum and dissimilar prior knowledge and experiences in both subject areas.

The Current Study

Few studies combine socioeconomic, sociocultural, and linguistic perspectives in a much-needed "ecological and multidimensional view of language minority children's development" (Gonzalez, 2001, para. 1; see also Cummins, 2000) to fully understand academic outcomes. Thus it is not surprising that the outcomes for immigrant ESL students in the Canadian context are unclear. Worswick (2001) and Samuel et al. (2001) find that immigrant outcomes, including those of ENFL students, equal or exceed those of native English-speaking Canadians. By contrast, another corpus of work indicates massive ESL (i.e., ENFL) school dropout rates (Derwing, DeCorby, Ichikawa & Jamieson, 1999; Watt & Roessingh, 1994, 2001) or disappearance from academic courses (Gunderson, 2004, 2007). Notwithstanding these studies, Chow (2004) reminds us of the "paucity of research on the school performance of minorities in Canada" (para. 4) despite the continual influx of immigrants to Canada. This study addresses this gap by using an existing large, recent dataset to examine the effects of the diverse background factors identified on students' voluntary participation and performance in provincially examinable academic subjects.

In BC participation in these courses was (and is) mediated by the requirements for both graduation and postsecondary entrance. Language Arts 12, typically English 12, has been the only provincially examinable grade 12 course mandatory for graduation, whereas mathematics, the sciences, and the social studies have been selected by students according to their interests, abilities, and postsecondary plans. However, admission to Vancouver-area universities UBC and SFU has typically required three additional grade 12 provincially examinable courses. Thus although graduation in 2002 was possible with only one provincially examinable course, participation in others was (and is) a necessity for future academic mobility.

Data and Research Methodology

This article addresses the following specific questions.

- How do diverse ethnolinguistic groups of ENFL students’ participation rates and scores across provincially examinable grade 12 subject areas compare with their NES peers and with each other?
- How do diverse ethnolinguistic groups of ENFL students’ participation rates and scores across provincially examinable grade 12 subject areas compare with each other across subject areas when controlling for social class and language proficiency?

The research methodology includes:

- Descriptive statistics;
- Logistic regression models to analyze participation in specific provincially examinable subjects;
- Linear regression models to analyze high school achievement scores in these subjects.

Data Derivation

Longitudinal administrative (demographics, school programs) and assessment data (course participation and achievement) for the graduating class of 2002 in one large urban BC public school board were provided by the BC Ministry of Education. We focused on regular students (19 years old or less) for whom grade 12 achievement data in selected academic courses were available. The final research sample consists of $N=4,075$ students (57% of the September 2001 enrollment) in 18 secondary schools.

Research Sample

To divide the sample accurately into ENFL students and native English speakers we classified it in two ways:

- ESL program enrollment: ESL (students enrolled at least one year in an ESL program) versus No ESL (students never enrolled in ESL programs);
- Home language: English (students who indicated only English as home language since 1990) versus Other (students who indicated another home language at least once since 1990).

The distribution of students across the resulting four groups is shown in Table 1.

This article examines the two groups that constitute over 90% ($N=3,698$) of the research sample, English-speaking students never enrolled in ESL (NES) and Other-home-language students enrolled at least once in ESL (ENFL). Neither of the remaining small groups clearly meets the criteria of immigrant

Table 1
Home Language by Participation in ESL Programs

<i>ESL Programs</i>	<i>Home Language</i>		<i>Total</i>
	<i>English</i>	<i>Other</i>	
No ESL	1,019 (86%)	212 (7%)	1,231 30%
ESL	165 (14%)	2,679 (93%)	2,844 70%
Total	1,184 100%	2,891 100%	4,075 100%

ENFL students that we intended to study. We include children of immigrant families in the *immigrant* label, and refugees are also included.

Variables

DV: marks and participation. We retrieved final marks (school and provincial exam marks combined) in Language Arts 12 (one of English or Communications), Mathematics 12, Biology 12, Chemistry 12, Physics 12, Geography 12, and History 12 for the graduating class of June 2002. We considered three years of provincial exam data to obtain accurate information on students who had written exams in grades 10 or 11 (perhaps higher achievers). All the above subjects exceeded 5% student participation. To supplement the discrete examinations of the subjects above, an overall grade 12 final mark was calculated based on the final marks obtained in each subject as a general measure of students' performance. Course enrollment plus final exam participation indicated participation in a given course.

IV: Individual characteristics. Gender is considered in modeling participation and achievement. Fifty-two percent of ESL students are female, as are 51% of NESs. Age of first entry to the school system is included; for ESL students it acts as a partial proxy for language proficiency and cultural knowledge as it often indicates the approximate date of arrival in Canada, although migration from other Canadian provinces is possible. The average age on entering the BC school system was about 7 for NESs and 9 for ESL. Time spent in ESL programs is also a proxy for language proficiency; more time spent in ESL classes indicates lower English-language ability.

IV: Social class characteristics—neighborhood. Based on students' postal codes in grade 12 and Census data, specific SES indicators of their neighborhoods could be employed. Because many of these socioeconomic indicators were highly correlated, we kept only two in the analysis: proportion of people with university degrees (educational); and proportion of families with income less than 20k (economic).

IV: Social class characteristics—school. The school board provided the proportion of families on income assistance (IA), as a measure of economic hardship, at the school level in 2002; we created a dichotomous high SES-low SES variable based on these data. Schools with percentages higher than the district average of 9% on IA were deemed low SES; those below 9% were deemed high SES. Further cluster analysis with 2001 Census data (provided by the BC Ministry of Education) on education and employment levels in schools (i.e., based on school head counts and students' postal codes) satisfactorily confirmed our categorization. Low SES schools enrolled 37% of the sample.

It is important to stress that although individual SES is certainly related to community SES, our social class variables do not directly measure SES at the individual level.

IV: School program enrollment. We hypothesized that enrollment in special programs—special education, gifted, and French immersion—might be indicative of individual academic ability, lower in the case of the former program and higher in the case of the latter two. We assigned students to programs if their records indicated that they had participated in one of the programs at least once in their school careers. Table 2 shows the breakdown between groups.

Table 2
School Program Enrollment

School Program	NES N		ENFL N	
Gifted students (ever)	210	21	507	19
Special education (ever)	95	9	138	5
French Immersion (ever)	121	12	71	3

IV: *Ethnicity—ethnolinguistic groups.* As a proxy for ethnicity, the ENFL sample was divided into the six most numerous linguistic groups according to their self-reported home language.

- Students reporting Mandarin, Cantonese, or Chinese were labeled *Chinese* ($n=1,708$);
- Students reporting Punjabi, Hindi, Urdu, or Gujarati were labeled *South Asian* ($n=250$);
- Students reporting Vietnamese were labeled *Vietnamese* ($n=181$);
- Students reporting Philippino or Tagalog were labeled *Tagalog* ($n=105$);
- Students reporting Spanish were labeled *Spanish* ($n=75$);
- Students reporting Korean were labeled *Korean* ($n=64$);
- All other reported languages were labeled *Other* ($n=296$).

We recognize the limitations of implicitly assuming both that speakers of diverse languages share the characteristics of the “same” ethnic group and that speakers of the same language hail from the same geographic or cultural area. A more nuanced approach to ethnicity was limited by the data available. Still, this study is a refinement of others that speak only, for example, of *Asian-Americans* (Peng & Wright, 1994).

Study Findings

Overall Participation and Achievement in Grade 12 Academic Subjects by Home Language Groups

Performance and participation in academic provincially examinable subjects is presented in Table 3 for native English speakers, all ESL students, and ethnolinguistic subgroups of ENFL students for math and the sciences (hereafter the sciences) and in Table 4 for English and the social studies (hereafter the humanities). Performance varies slightly across groups and subjects; in general, the NES group slightly outperforms the ENFL group as a whole, more so in the humanities than in the sciences. Participation rates, however, are dramatically higher among the ENFL group in math, chemistry, and physics and slightly higher in biology. The only subject showing dramatically lower participation rates for ENFL students is history. Nonetheless, examining ENFL students as a homogeneous group is misleading.

The analyses by ethnolinguistic groups show the dominance of Chinese and Korean speakers in the sciences, especially math, chemistry, and physics. Although the aggregate mean performance scores are lower for ENFL students than for NESs across the sciences (save for math), in reality Chinese speakers outperform NESs in math and biology and equal them in chemistry and physics. Koreans outperform NESs and Chinese speakers in math and NESs in

Table 3
Participation and Performance of NES, All ENFL and Ethnolinguistic
Subgroups of ENFL in the Sciences

Home Language Group	Math			Chemistry			Physics			Biology		
	% Partic	Mean Score	N	% Partic	Mean Score	N	% Partic	Mean Score	N	% Partic	Mean Score	N
English (NES)	40	72	408	25	75	255	16	73	163	42	69	428
All ENFL	67	72	1,808	52	74	1,380	31	72	830	46	68	1,226
Chinese	83	75	1,421	66	75	1,118	41	73	707	48	72	814
South Asian	31	60	78	26	61	64	8	66	19	48	61	119
Tagalog	22	56	23	19	58	20	3	67	3	52	55	55
Vietnamese	41	61	75	24	63	43	10	63	18	48	62	86
Korean	86	76	55	75	74	48	34	63	22	31	71	20
Spanish	25	56	19	12	65	9	7	57	5	32	52	24
Other	46	65	137	74	73	78	19	67	56	37	68	108

biology. Only in physics is Korean performance substantially lower than NES or others. All other ethnolinguistic groups achieve substantially lower performance scores than their Chinese-speaking and NES peers across the sciences, with the lowest scores obtained by Tagalog and Spanish speakers.

The participation results for science are even more dramatic. Eighty-three percent of Chinese and 86% of Koreans participate in Math 12, more than doubling the participation of NESs. Vietnamese students also exceed NESs in per-capita participation. Chinese and Korean speakers also have the highest rates of participation in chemistry and physics whereas in the latter course Tagalog and Spanish speakers have meager 3% and 7% participation rates respectively. Only in biology does participation become more evenly distributed among ethnolinguistic groups, with Tagalog speakers forming the largest per-capita group and Korean the smallest, interesting given their high relative rate of participation in the other sciences.

The humanities story is similar ethnolinguistically but with lower relative levels of participation and performance. Participation rates are high in English for all groups because a language arts course is mandatory for graduation. Those who did not take English 12 probably took Communications 12, a less academic option. Therefore, the high participation rate in English among Chinese and Korean speakers compared with Tagalog and especially Spanish speakers is noteworthy. The Chinese mean score is substantially higher in English than for the other defined ethnolinguistic groups. Korean speakers are the dominant participators in history, although all ethnolinguistic groups' participation is low in this subject area. Again Chinese speakers score the highest and Spanish speakers the lowest. Koreans participate the most in geography in contrast to Spanish speakers who do so the least, and score the highest in contrast to Tagalog speakers who score the lowest. Geography is the only area where Chinese speakers' performance is substantially below another ethnolinguistic group and one of only two subjects where their performance is not the highest overall (see Table 4).

Table 4
 Participation and Performance of NES, All ENFL and Ethnolinguistic
 Subgroups of ENFL in the Humanities

Language Group	English			History			Geography		
	% Partic.	Mean Score	N	% Partic.	Mean Score	N	% Partic.	Mean Score	N
English (NES)	93	74	948	44	73	448	37	71	377
All ENFL	85	69	2,287	19	69	512	30	67	811
Chinese	88	70	1,499	17	72	282	30	68	507
South Asian	82	65	206	24	68	61	31	65	78
Tagalog	76	63	80	14	64	15	35	56	37
Vietnamese	78	66	141	17	66	30	30	66	54
Korean	89	66	57	30	69	19	36	74	23
Spanish	71	65	53	19	54	14	23	61	17
Other	85	69	251	31	66	91	32	69	95

The participation and performance rates seen thus far might be thought to correspond to the socioeconomic standing of each ethnolinguistic group. For example, Chinese speakers are widely presumed to be high SES in Greater Vancouver, and Spanish speakers hailing from Central America far less so. At this point, regression analyses were conducted to control for SES to see how strongly the ethnic variable explained differences among ENFL students.

Table 5 shows logistic regressions for participation in the sciences, geography, and history. English is not included in participation analyses because language arts is mandatory. Each model, or column, predicts the participation in the specified subject by individual, ethnolinguistic, socioeconomic, and program enrollment variables when all variables are controlled for each other. The table reports odds ratios: the odds that a category (i.e., female) of a variable (i.e., gender) predicts participation relative to the variable’s reference category (i.e., male). A score of 1.000 indicates even odds (no advantage to either category). For example, in Math 12, girls are have .73 the odds of boys to participate; Vietnamese have one quarter the odds of Chinese to participate, and students at high-SES schools have 1.7 times the odds to participate than those at low SES schools.

Similar patterns hold across math, physics, and chemistry, and all models are well described by the independent variables (e.g., the *R* squared shows physics and mathematics models explain 32% and 41% of the variability in the outcome respectively). ENFL students have better odds of participation in these academic disciplines if they are male and if they enter the school system at a later age. The number of years spent in ESL classes is not significant. Language proficiency appears not to be an important variable in predicting participation in these three courses, but ethnicity is largely significant. Compared with all ethnolinguistic subgroups except the Korean-speaking students, Chinese-speaking students have overwhelmingly better odds of participation even with SES and other controls in place. For example, they have 10 times the odds of Spanish speakers to enroll in Math 12 and Physics 12, and 20 times the

Table 5
Odds Ratios for ENFL Participation in Six Academic Subjects

<i>Variables</i>	<i>Odds Ratio</i> <i>Math</i>	<i>Odds Ratio</i> <i>Physics</i>	<i>Odds Ratio</i> <i>Chemistry</i>	<i>Odds Ratio</i> <i>Biology</i>	<i>Odds Ratio</i> <i>Geography</i>	<i>Odds Ratio</i> <i>History</i>
Gender (M=0; F=1)	0.730*	0.303**	0.812*	2.465**	1.146	0.827
Age entering system	1.142**	1.127**	1.101**	0.834**	.859**	.836**
Years in ESL	1.021	0.984	0.991	0.881**	0.984	0.987
<i>Ethnicity</i> (Chinese=0)						
South Asian	0.151**	0.204**	0.342**	0.846	0.862	1.343
Tagalog	0.053**	0.040**	0.139**	1.291	1.597*	1.059
Vietnamese	0.250**	0.277**	0.322**	0.847	1.007	0.891
Korean	0.55	0.397*	0.728	0.691	2.043*	4.526**
Spanish	0.104**	0.160**	0.113**	0.488*	0.643	1.1
Other	0.182**	0.349**	0.179**	0.496*	1.175	2.374**
<i>SES-school</i> (Low=0; High=1)						
SES-univ parents	1.721**	1.414*	1.687**	0.598**	1.456**	.777*
SES—income<20k	1.018*	1.011	1.029**	1.015*	0.996	1.006
SES—income<20k	0.992	0.985	0.997	1.004	1.004	1.001
Evergifted	3.059**	3.087**	2.699**	1.687**	0.854	1.386*
Eversped	0.113**	0.280**	0.146**	0.252**	0.465	.448*
Everfrenim	0.999	0.784	0.825	0.834	0.678	1.297
(Constant)	0.796	0.267*	0.289*	4.930**	1.45	0.945
Model Chi square	932.8**	682.9**	798.8**	372.1**	132.831	176.178
Nagelkerke F^2	0.412	0.319	0.345	0.174	0.069	0.103
Percentage Correct	79.1	75.7	73.6	65.4	69.4	80.9

* $p < .05$ ** $p < .001$.

odds of enrolling in Math 12 and Chemistry 12 of Tagalog speakers. Chinese speakers have 3 to 4 times the odds of enrolling in these courses of Vietnamese speakers, and 3 to 6 times better odds than speakers of South Asian languages. Enrollment in a high-SES school is also a highly significant and substantial predictor of participation in these three subjects.

By contrast, participation in biology is overwhelmingly female and significantly predicted by increased linguistic proficiency, as evidenced by an earlier age entering the system and less time spent in ESL classes. Ethnolinguistic status is not often significant, and students enrolled in low-SES schools are more likely to participate. Not surprisingly, however, for all models, ever being enrolled in a gifted class or a special education class are the strongest predictors of participation in these academic subjects. Lower ages entering the system significantly increase the odds of participation in geography and history. Korean speakers have significantly higher odds than their peers of participating in these two subjects, although Tagalog speakers also have a participation advantage over others in geography. Attending a high-SES school increases participation in geography, but not in history. Geography and history models are far weaker than those for the sciences with R squares reporting only 7% and 10% of variability explained respectively.

Table 6
Regression Analyses for ENFL Performance in Math, English, and Overall

<i>Variables</i>	<i>Math</i>	<i>English</i>	<i>Grade 12 overall</i>
Gender (<i>M</i> =0; <i>F</i> =1)	0.032	.111**	.068**
Age entering system	0.048	-.290**	-.080*
Years in ESL	-.098*	-.156**	-.108**
<i>Chinese=0</i>			
South Asian	-.096**	-.087**	-.106**
Tagalog	-.088**	-.081**	-.129**
Vietnamese	-.076**	-.062*	-.088**
Korean	-.025	-.023	-.034
Spanish	-.071*	-.039*	-.080**
Other	-.124**	-.040*	-.112**
SES-school (low=0;high=1)	0.028	-.038	0.008
SES-uni	0.065	.107**	.100**
SES -inc.< 20k	-.068*	-.027	-.063*
Evergifted (<i>n</i> =0; <i>y</i> =1)	.167**	.228**	0.202**
Eversped (<i>n</i> =0; <i>y</i> =1)	-.021	-.058*	-.037*
Everfrenim (<i>n</i> =0; <i>y</i> =1)	0.009	-.001	-.019
Constant			
Adjusted <i>R</i> ²	0.115	0.162	0.148
Anova	<i>F</i> =16.548**	<i>F</i> =30.401**	<i>F</i> =31.579**

Table 6 shows the regression models that predict performance for the foundational courses of the sciences and humanities, math and English respectively, and for overall achievement scores. The standardized regression coefficients describe the positive or negative association between predictors (e.g., years in ESL) and the outcome variable (e.g., final grade 12 mark in math), and the relative contribution of the predictor variables in explaining the outcome. Thus we see a significant gender advantage to females in English and Overall. There is a substantial and significant disadvantage to entering the system later for English, but none for math. For Overall scores a significant, though smaller, disadvantage remains for entering the system later. More time spent in ESL predicts reduced scores most strongly in English and somewhat less so in math and Overall.

Chinese speakers retain a performance advantage over all other ethnolinguistic groups in English and math and Overall scores. Only Korean speakers who exhibit a small and insignificant disadvantage approach Chinese speakers' scores. South Asians are the farthest below in math and English, and Tagalog speakers the farthest below Overall. Vietnamese and Spanish speakers also remain somewhat below Chinese speakers across the three columns, albeit less so for Spanish speakers in English.

School SES ceases to play a significant role in performance, although the education level of the neighborhood significantly predicts higher performance in English and Overall scores. By contrast, students in lower-income neighborhoods face small but significant disadvantages in math and Overall scores. Perhaps not surprisingly, for performance the strongest predictors were enroll-

ment in gifted programs. By contrast, having ever been enrolled in a special education program significantly, though minimally, reduces performance in English and overall scores. Performance models are much weaker than the participation models, explaining between 11% and 16% of the variance in the outcome.

Discussion

All the results should be interpreted in the light of data limitations and the study's parameters. We wished to explore trajectories of immigrants and children of immigrant ENFL students. These students may be imperfectly captured; some students needing ESL service may not have received it, and therefore would not have met our selection criteria. Others speaking other home languages and requiring ESL might not have had immigrant parents. And in BC's ethnically diverse Lower Mainland, native English-speakers certainly include immigrant children for whom English is not a first language, but who did not need ESL service. Our measures of English-language proficiency are also indirect. Nonetheless, some broad insights into immigrant ENFL achievement have been gained.

Sociocultural and Socioeconomic Factors

Because ENFL students in the urban Lower Mainland are predominantly from voluntary immigrant families, their high participation rates in prestigious provincially examinable courses (see Tables 3 and 4) seem initially to verify Ogbu's (1992) claim that such families exist in "an educational climate or orientation that strongly endorses academic success" (p. 291). We regret that our data could not distinguish immigrants from refugees, though Ogbu has little to say about this distinction. In any case, however, the subsequent analyses by ethnolinguistic groups reveal dramatic differences in participation rates. Although Chinese and Korean speakers more than double the participation rate of NESs in mathematics, physics, and chemistry, their South Asian, Tagalog, Vietnamese, and Spanish-speaking peers lag behind NESs, in some cases precipitously (e.g., Tagalog speakers in physics). Biology participation is somewhat more evenly distributed; however, Chinese and Korean speakers have a marked performance advantage over the other four ethnolinguistic groups in all the sciences with the exception of Korean speakers in physics.

Although participation is more evenly distributed in the humanities, occasionally favoring other groups, Chinese and Korean performance still overtakes the four other groups, thus demonstrating both differences between Asian and non-Asian (Spanish-speaking) immigrant groups and echoing Kao's (1995) finding that "Asians are not uniformly advantaged educationally" (p. 151). Indeed, these results suggest that interpretation in the light of Ogbu's (1992) theory has to be significantly tempered with understandings of ethnic groups' cultural values, or community forces, independent of the immigrant experience. The participation and performance of Chinese speakers across the sciences supports Chow's (2004) assertion that the Chinese community prioritizes educational values and a work orientation. By contrast, the lower participation and achievement of Tagalog and Spanish speakers and to a lesser degree Vietnamese and South Asian language groups belies Ogbu's assertion that "in [immigrant] communities social, peer, and psychological pressures not

only encourage students to perform like Whites [i.e., dominant population] but also to surpass Whites in academic achievement" (p. 291). To a large degree, the high achievement of Chinese-language speakers and the low achievement of Spanish, Tagalog, and Vietnamese students reported here echo Gunderson's (2004, 2007) findings for these groups.

One intuitively attractive possibility is that these differences can be explained in terms of the SES of the ethnolinguistic groups. Indeed, school SES proves to be an important predictor of participation in math, physics, chemistry, and geography; the former three courses Sanders and Nelson (2004) claim are the gateways to high-status careers (see also Adamuti-Trache & Andres, *in press*). Because attendance at neighborhood schools was, and to a lesser degree is still, the dominant paradigm in BC in 2001-2002, high-SES schools would be predominantly attended by students whose families could afford homes in wealthy neighborhoods (e.g., Gunderson, 2007, describes wealthy immigrants choosing houses based on neighborhood school). Because the students attending these high-SES schools were 1.4 to 1.7 times more likely to participate in these gateway courses than their peers at low SES schools, segmented assimilation (Portes & Zhou, 1993) is evidently occurring in the district; wealthier immigrant families are ensuring that their children travel the pathways of upward social mobility. ENFL students' success depends fairly strongly on the economic and human capital their families bring to the home-school equation. As Zhou (1997) reminds us, "family socioeconomic status shapes the immediate social conditions for adaptation" (p. 987).

Critically, however, the ethnic group effect remains strong across math, physics, and chemistry even when SES is controlled. Chinese students are still far more likely to take these courses than their non-Chinese-speaking peers. Moreover, when we observe performance, school SES ceases to be significant, indicating that it plays a filtering role in influencing who enrolls in the courses, but is not important in determining the performance of those who eventually do. Although living in a university-educated and higher-income neighborhood is significant overall and for English and math respectively, Chinese speakers still retain a significant performance advantage over all other ethnolinguistic groups except Korean speakers in English, math, and overall scores. Although individual characteristics may be most important, the clear advantage of Chinese students, and to some degree Koreans, over their peers even when controlling for SES and language proficiency indicates that these ethnic groups have specific values or community forces that contribute to achievement that do not crosscut other immigrant groups.

The finding that Chinese or Asians in general favor math and science courses is not new (Kao, 1995; Li, 2001). Both Kao and Li hypothesize that this phenomenon is owing to a strain of Sue and Okazaki's (1990) "relative functionalism" whereby Asians see the opportunities offered by the humanities closed to them by discrimination, thereby increasing the value of the sciences, which lead to "safe" professions like accountancy, physical science research, engineering and medicine. Although there may be some truth in this hypothesis, it cannot account for the low participation in the sciences, and equal or higher participation in the humanities, of Filipino Tagalog speakers, South Asians, and Vietnamese.

Language Factors

Socioeconomic and ethnolinguistic variables do a poor job of illuminating patterns of participation in the humanities and biology. To understand results for these subject areas, it is perhaps more fruitful to consider linguistic factors. Whereas in math, physics, and chemistry the odds of participation are actually increased by entering the school system at a later age, in history, geography, and biology the odds are significantly reduced by entering the system at a later age. Geography and history are both subdisciplines of social studies, which Chamot and O'Malley (1994) claim contain proportionally more context-reduced language than the sciences, and which they and Duff (2001) assert depends most on specific cultural knowledge that ESL (i.e., ENFL) students are less likely to have, particularly the later they enter the school system due to the cumulative nature of the social studies curriculum. Chamot and O'Malley also provide evidence of the linguistic difficulties inherent in biology, a science that does not share a mathematical foundation with physics or chemistry.

Although years spent in ESL, our other proxy for reduced linguistic proficiency, are significant only for participation in biology, the performance scores seem to bear out a distinction between the linguistic and cultural difficulties inherent in the humanities versus the sciences. The overall scores are negatively correlated to both age entering the system and years spent in ESL, supporting the commonsense notion that reduced linguistic proficiency leads to reduced performance. However, the disadvantage varies across subject areas. In sum, increased age entering the school system does not significantly affect math performance, but is fairly dramatically negatively correlated with performance in English. Similarly, although years spent in ESL is negatively correlated with math performance, it appears more strongly correlated with English performance, thereby supporting Chamot and O'Malley's (1994) claim that the literature classroom can be culturally confusing and linguistically formidable and Early's (2003) finding that many ESL students were "tremendously disadvantaged" (Summary and Implications, para. 1) in entering the discourse community of the English class. Although these results also attest to the fact that math is not easy for ESL students as folk beliefs often maintain, it seems that prior training in math can help overcome linguistic hurdles (Seror, 2002), an advantage not available in the English classroom.

These results do not nullify theories that the discriminatory context of the host society leads minorities to pursue upward mobility through the sciences, but they remind us that such theories ought to be tempered with the commonsense notion that some courses are strategically wiser choices for ENFL students who face increased disadvantages to the degree that courses are culturally loaded and linguistically challenging.

Special Program Enrollment

It must be recognized that much of the variation in the models is brought about by special program enrollment. Our models thus indicate that an individual's previous propensity for academic achievement—as evidenced by enrollment in gifted or special education—is the most important predictor of performance and usually participation for all students; however, this achievement varies in a context mediated by ethnicity, SES, and language proficiency for ENFL students.

Summary and Implications

The results of this study do not support Ogbu's (1992) heuristic explanation of minority achievements. Two of the minority groups, Chinese speakers and Koreans, generally participated and performed at levels at or greatly exceeding the NES population; however, the four other defined ethnolinguistic groups, who also represent immigrants, children of immigrants, or refugees, in the Greater Vancouver context, participated and performed at levels below, in some cases far below, the NES mainstream and their Chinese and Korean peers. Although it is tempting to suppose that the socioeconomic position of the ethnolinguistic groups might explain away this difference, the effect of belonging to particular ethnolinguistic groups remained a strong and significant predictor of participation across prestigious math and science courses, and Chinese performance still outstripped that of the other ethnolinguistic groups across subject areas even when controlling for SES. Therefore, the community forces and cultural values of some ethnolinguistic groups, Chinese and Korean, confer educational advantage, but voluntariness of immigration does not seem to be the deciding factor. Nonetheless, SES was clearly a significant and important additional factor in determining participation in these three courses as well as geography, leading to the conclusion that segmented assimilation is occurring to some degree among the immigrant population.

Although earlier qualitative evidence documenting perceptions of racism in the host society cannot be refuted, the results of this study also indicate that it is reasonable to interpret ENFL participation in the sciences as a strategic choice based on the linguistic and cultural difficulties inherent in humanities courses. Further qualitative and microethnographic research could uncover both students' perceptions of the linguistic and cultural hurdles present in each class and contribute to our understanding of the types of discourse tasks inherent in each subject area. Despite some recent literature (Duff, 2001; Early, 2003; Harklau, 1999), far more qualitative work needs to be done in the latter area. In the meantime, if we wish to have an immigrant population well versed in the humanities, efforts will have to be made to prepare them better for the curricula, perhaps through collaboration between ESL and mainstream teachers, which could be facilitated with the additional money the province provides school boards to support ESL students. Furthermore, the curricula will have to speed up their slow march toward greater inclusivity.

Further qualitative research might also usefully compare the perceptions and cultural beliefs and possibly home environments of two or more of the ethnolinguistic groups in this study to illuminate why such disparities exist between the participation and performance of Chinese- and Korean-speaking students and their other ethnolinguistic peers. In fact given that the sample captures only students who progressed as far as grade 12, probably many of the identified subgroups here may actually be faring even more poorly in their K-12 educations than indicated here (Derwing et al., 1999; Gunderson, 2004, 2007; Watt & Roessingh, 1994, 2001). Administrators, counselors, teachers, and multicultural workers also should be made aware that students of identifiable ethnic groups are effectively being tracked away from certain subject areas, for example, Filipinos (Tagalog speakers) from physics, so that they can make efforts to mitigate this process. Moreover, to the extent that academic participa-

tion occurs less at low-SES schools, frontline workers and district administrators have to be even more concerned about these populations. Because school boards in BC have wide latitude for spending funds meant to support students in ESL programs, more targeted support programs for underachieving populations and release time for collaboration between ESL and content area specialists in schools with underachieving ESL (i.e., ENFL) populations can plausibly be developed.

This article capitalizes on the data available to explore from a multidimensional perspective the equality of educational outcomes for varied subgroups of students for whom English is not a first language. The investigation was necessarily limited by the quality and quantity of the data available to us, and thus results should be viewed with caution. Nonetheless, we have shown that even with limited data, it is possible to explore relationships in ways that help to inform, modestly, educational policy and practice. It is a step toward examining equality of outcomes and academic mobility among the ENFL population in BC.

References

- Adamuti-Trache, M., & Andres, L. (in press). Embarking on and persisting in scientific fields of study: Social class, gender and curriculum along the science pipeline. *International Journal of Science Education*.
- Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge, UK: Cambridge University Press.
- Bourdieu, P., & Passeron, J.C. (1977). *Reproduction in education, society and culture*. London: Sage.
- Bradley R.H., & Corwyn R.F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53, 371-99.
- Carrasquillo, A.L., & Rodriguez, V. (2002). *Language minority students in the mainstream classroom*. Toronto, ON: Multilingual Matters.
- Chamot, A., & O'Malley, M. (1994). *The Calla handbook*. Reading, MA: Addison Wesley.
- Chow, H. (2000). The determinants of academic performance: Hong Kong immigrants in Canadian schools. *Canadian Ethnic Studies*, 32(3). Retrieved July 17, 2004, from CBCA Education database.
- Chow, H. (2004). The effects of ethnic capital and family background on school performance: A case study of Chinese-Canadian adolescents in Calgary. *Alberta Journal of Educational Research*, 50. Retrieved January 5, 2005, from CBCA Education database.
- Collier, V. (1987). Age and rate of acquisition of second language for academic purposes. *TESOL Quarterly*, 21, 617-641.
- Collier, V. (1989). How long? A synthesis of research on academic achievement in a second language. *TESOL Quarterly*, 23, 509-531.
- Cummins, J. (2000). *Language power and pedagogy: Bilingual children caught in the crossfire*. Toronto, ON: Multilingual Matters.
- Duff, P. (2001). Language literacy and content and (pop) culture: challenges for ESL students in mainstream courses. *Canadian Modern Language Review*, 58(1), Retrieved November 16, 2004, from CBCA Education database.
- Derwing, T.M., DeCorby, E., Ichikawa, J., & Jamieson, K. (1999). Some factors that affect the success of ESL high school students. *Canadian Modern Language Review*, 55, 532-547.
- Early, M. (2003). Literate traditions are "culturally constituted tools." *English Quarterly*, 35(1), Retrieved February 6, 2005, from CBCA Education database.
- Fllege, J.E., Yeni-Komshian G., & Liu, S. (1999). Age constraints on second language learning. *Journal of Memory and Language*, 41, 78-104.
- Gonzalez, V. (2001). The role of socioeconomic and sociocultural factors in language minority children's development: An ecological research view. *Bilingual Research Journal Online*, 25(1&2). Retrieved September 6, 2004, from: <http://brj.asu.edu/v2512/articles/art2.html>
- Gunderson, L. (2004). The language, literacy, achievement, and social consequence of English only programs for immigrant students. In J. Hoffman & D.Shallert (Eds.), *National reading conference yearbook* (pp. 1-27). Milwaukee, MI: National Reading Conference.
- Gunderson, L. (2007). *English only instruction and immigrant students in secondary schools: A critical examination*. Mahwah, NJ: Erlbaum.

- Harklau, L. (1999). The ESL learning environment in the secondary school. In C. Faltis & P. Wolfe (Eds.), *So much to say: Adolescents, bilingualism and ESL in the secondary school* (pp. 42-60). New York: Teachers College Press.
- Haveman, R., & Wolfe, B. (1994). *Succeeding generations: On the effects of investments in children*. New York: Russell Sage Foundation.
- Kao, G. (1995). Asian-Americans as model minorities? A look at their academic performance. *American Journal of Education*, 103, 121-159.
- Li, J. (2001). Expectations of Chinese immigrant parents for their children's education: The interplay of Chinese tradition and the Canadian context. *Canadian Journal of Education*, 26, 477-494.
- Ma, X. (2002). Socioeconomic gaps in academic achievement within schools: Are they consistent across subject areas? *Educational Research and Evaluation*, 6, 337-355.
- Ogbu, J.U. (1992). Adaptation to minority status and impact on school success. *Theory into Practice*, 31, 287.
- Ogbu, J.U., & Simons, H. (1998). Voluntary and involuntary minorities: A cultural-ecological theory of school performance with some implications for education. *Anthropology and Education Quarterly*, 29, 155-188.
- Peng, S.S., & Wright, D. (1994). Explanation of academic achievement of Asian American students. *Journal of Educational Research*, 87, 346-352.
- Portes, A., & Rumbaut, R. G. (1990). *Immigrant America: A portrait*. Berkeley, CA: University of California Press.
- Portes, A., & Zhou, M. (1993). Should immigrants assimilate. *Public Interest*, 94(116), 18-35.
- Samuel, E., Krugly-Smolksa, E., & Warren, W. (2001). Academic achievement of adolescents from selected ethnocultural groups in Canada. *McGill Journal of Education*, 36(1), 61-73.
- Sanders, J., & Nelson, S.C. (2004). Closing gender gaps in science. *Educational Leadership*, 62(3), 74-77.
- Schneider, B., & Lee, Y. (1990). A model for academic success: The school and home environment of East Asian students. *Anthropology and Education Quarterly*, 21, 358-377.
- Seror, J. (2002). *Learning from example: Exploring immigrant language minority students' perceptions of what it takes to "make it" as an ESL student*. Unpublished master's thesis, University of British Columbia.
- Sue, S., & Okazaki, S. (1990). Asian-American educational achievements: A phenomenon in search of an explanation. *American Psychologist*, 45, 913-920.
- Watt, D., & Roessingh, H. (1994). ESL dropout: The myth of educational equity. *Alberta Journal of Educational Research*, 40, 283-296.
- Watt, D., & Roessingh, H. (2001). The dynamics of ESL dropout: Plus ça change ... *Canadian Modern Language Review*, 58, 203-222.
- White, K.R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin*, 91, 461-481.
- Worswick, C. (2001). *School performance of the children of immigrants in Canada*. Ottawa: Statistics Canada.
- Zady, M., & Portes, P. (2001). When low SES parents cannot assist their children in solving science problems. *Journal of Education for Students Placed at Risk*, 6, 215-229.
- Zhou, M. (1997). Segmented assimilation: Issues, controversies, and recent research on the new second generation. *International Migration Review*, 31, 975-1008.