

The Immersion Centre and the Dual-Track School: A Study of the Relationship between School Environment and Achievement in a French Immersion Program

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Now that the early French-immersion program is a well-established educational alternative for English-speaking students in the Carleton Board of Education in Ontario, it has become important to examine factors which may influence the achievement of immersion students. In this study two different school settings for the program are compared: immersion centres housing only the immersion program, and dual-track schools in which both the immersion and regular English programs operate. Earlier program evaluation results had led to the hypothesis that the immersion centre environment might be more conducive to achievement in a French immersion program than the dual-track school environment. A battery of achievement tests of French, English, and other subjects was administered to classes of Grade 5 students in both school settings, and questionnaires were developed to gather relevant information from students, teachers, and principals. The test results indicate superior achievement on the part of immersion centre students in several aspects of French and English skills. The questionnaire data provide information on the possible reasons for these differences. The overall implication of the study for planning immersion programs is to provide a school environment which encourages the maximum use of French.

Maintenant que le programme de français par immersion s'avère un choix bien établi en matière d'enseignement pour les élèves de la Commission scolaire de Carleton, il devient important d'examiner les facteurs qui sont susceptibles d'influer sur le rendement des étudiants. Cette étude avait pour objet de comparer deux milieux d'apprentissage de français: dans le premier cas il s'agissait d'un milieu ne comportant qu'un programme d'immersion alors que dans le deuxième cas il s'agissait d'un milieu offrant un programme d'immersion de français et le programme régulier d'anglais. Les résultats d'évaluations de tels programmes avaient fait naître l'hypothèse selon laquelle l'environnement des centres d'apprentissage pouvait être plus propice à la réussite des étudiants dans un programme de français par immersion seulement que dans l'environnement offrant à la fois un programme d'immersion et un programme régulier d'anglais. Dans les deux cas précités, on a soumis des étudiants de 5^{ième} année à une série de tests de connaissance de français, d'anglais et autres matières académiques. On a également élaboré divers questionnaires dans le but de recueillir des renseignements pertinents de la part d'étudiants, d'enseignants et de directeurs d'écoles. L'analyse des résultats montre que les étudiants des centres d'immersion seule ont mieux réussi que ceux des écoles offrant les deux programmes, et ce, sous plusieurs aspects touchant leurs aptitudes en français et en anglais. L'implication générale de cette étude pour la planification de programmes d'immersion est d'offrir un milieu scolaire qui favorise l'utilisation maximale du français.

In the long-term evaluation of the early French-immersion program in the public school boards of the Ottawa-Carleton region of Ontario, the

most thoroughly assessed aspects have so far been the overall academic and second-language achievement of the immersion students in relation to reference groups outside the program. In order to determine what effect the immersion program may have had on the students' general academic progress, comparisons have been made between groups of immersion students and their peers in the regular English program of the same boards;¹ and in order to assess the immersion students' progress in French, comparisons have been made with native French-speakers and, to the extent feasible, with groups of students enrolled in other French as a second language programs (Barik & Swain, 1975, 1977, 1978; Swain & Barik, 1976, 1977; Andrew, Lapkin, & Swain, 1979, 1980).

Assessment of the programs of the immersion students in relation to reference groups outside the program continues to be an important focus. At the same time, however, it is becoming increasingly important to consider variations connected with the immersion program itself, in order to determine whether one variation is superior to another in fostering the achievement of the immersion pupils. Such variations may have to do with the relative amount of time devoted to French and English in the program, the allocation of particular subjects to the French or English segments of the day, and the type of school setting in which the immersion program is housed. Evaluation of the relative merits of different immersion program variations is clearly of major significance to school boards who, having once decided to offer an immersion program, are still faced with difficult decisions with respect to time distribution, subject matter allotment, and housing of the program. The questions of time distribution and which subjects are best taught at different stages of the immersion program are being monitored (Swain, 1978; Andrew, Lapkin, & Swain, 1979). The question of school setting for the program has not previously been investigated in depth and it is with this issue that the present report is concerned.

BACKGROUND

In the Bilingual Education Project's 1978 evaluation of the French-immersion program in the Ottawa and Carleton Boards of Education, Andrew, Lapkin and Swain (1979) observed that at the Grade 5 level in 1977-78 there were differences in several areas of achievement (including aspects of French- and English-language skills, science, mathematics, and work-study skills) that favored immersion classes in the Carleton Board of Education over immersion classes in the Ottawa Board of Education. This finding was supplementary to the main finding of the evaluation that the Grade 5 immersion students were doing as well as, or better than, their peers in the regular English program in all areas tested. The immersion sample at the Grade 5 level consisted of four classes in three Carleton schools and two classes in two Ottawa schools. Two of

the three Carleton schools in the Grade 5 sample had been identified by the Carleton Board of Education as "immersion centres": they were already, or were in the process of becoming, schools in which only the French-immersion program is offered. The other three schools in the sample are what may be called "dual-track" schools, in which the immersion program is offered concurrently with the regular English program on a continuing basis.

In the absence of any other obvious reason for the between-board differences, Andrew et al. (1979) hypothesized that the immersion centre environment might be more conducive to achievement in a French-immersion program than the dual-track school environment. This hypothesis was formulated with respect to French achievement on the basis of considerable evidence that amount of exposure to the second language in the immediate environment (whether in the classroom or the home) enhances achievement in the second language (see, for example, Swain & Bruck, 1976; MacNab & Kirby, 1975). The immersion centre, it was argued, being more completely geared to the immersion program than the dual-track school, would be more likely to have French as the language of the school environment, and this in turn might tend to enhance the French skills of the immersion centre students.

On the other hand, it was cautioned, there was no evidence to suggest that the amount of use of the target language in the wider community environment is positively related to achievement in French in an immersion program. In a bilingual community, there may be little interaction between the Francophone community and immersion students. Indeed, in a study comparing French achievement results from immersion programs in a number of Canadian cities varying widely in the proportion of their populations who are native French-speaking, Swain (1979) found no association between immersion students' achievement in French and the use of French in the wider environment.

In the school environment, however, midway between the "micro" classroom or home environment and the "macro" environment of the wider community, one might reasonably expect an increased use of the target language to affect achievement in that language. Based on this reasoning, a further analysis was conducted to compare the French achievement of the Grade 5 immersion centre classes with the Grade 5 immersion classes in the dual-track schools. They found that the immersion centre students were scoring significantly higher than the dual-track students in three out of the four measures of French achievement that were administered: the Test de rendement en français ($p \leq .01$), the Test de compréhension auditive ($p \leq .001$), and the Test de compréhension de l'écrit ($p \leq .001$).² No significant differences were found on the fourth test, the Test de mots à trouver. These findings led the authors to conclude that the immersion centre phenomenon deserved further, more detailed study.

In an additional analysis of achievement results in areas other than French language arts, it was found that the immersion centre students were also a little ahead of those in the dual-track schools with respect to some of the English skills assessed by the Canadian Tests of Basic Skills (CTBS): namely, vocabulary ($p \leq .001$), reading comprehension ($p \leq .001$), usage ($p \leq .001$), and language total ($p \leq .05$). This finding is consistent with a suggestion made by Cummins (1979) that high levels of achievement in a second language may serve to enhance first-language skills and other aspects of cognitive functioning. The Grade 5 immersion centre students, with their higher level of achievement in French, may thus have had a corresponding advantage in English over the dual-track students. This advantage appeared to extend to other subjects as well. The immersion centre students were also found to be performing significantly better on a science test, and on all the work-study and mathematics tests of the CTBS.

THE ENLARGED STUDY

During 1979, a more detailed study of the relationship between school environment and achievement in French immersion was carried out with the assistance of a grant which was made available by the Carleton Board of Education. By extending its testing program at the Grade 5 level to new classes and additional schools in the Carleton Board of Education, the Bilingual Education Project was able to determine whether the 1978 achievement results favoring immersion centres were confirmed with a broader sample of schools taken from within a single board of education. At the same time, it was possible to administer questionnaires to staff and students which would provide detailed information about the school environment in immersion centres and dual-track schools.

Description of sample

The sample for the enlarged and more detailed study of the relationship between school environment and achievement in French immersion consisted of six immersion classes in five immersion centres of the Carleton Board of Education, four immersion classes from two dual-track schools, and five regular program classes from five schools in the same board. This sample included the three immersion centre classes, one dual-track school immersion class, and one regular program class tested in 1978. The remaining classes were tested in the spring of 1979. Three regular English classes were in schools devoted entirely to the regular English program, and the other two classes were in the dual-track schools. The distribution of classes across schools is summarized in Table 1. The total number of students involved in the study was 417, with 164 of them in immersion centres, 111 in the immersion program in the dual-track

TABLE 1
Distribution of Classes in Sample

	<i>Immersion Centres</i>					<i>Dual-Track Schools</i>		<i>Other Schools</i>
	A	B	C	D	E	F	G	
No. of immersion classes tested in 1978	1	2					1	
No. of immersion classes tested in 1979			1	1	1		2	1
No. of regular English classes tested							1	1
								3

schools, and 142 in the regular English program. The study also entailed a survey by questionnaire mailed to 94 staff members at the seven schools offering the immersion program. Various categories of staff were sampled: principals and vice-principals, immersion homeroom teachers, teachers of English to immersion students, regular English program teachers, and others such as librarians and specialist teachers.

The rationale for the selection of schools for the study was as follows: All schools which had been defined by the Carleton Board of Education as immersion centres and in which the immersion program had reached the Grade 5 level at the time of achievement testing were included in the sample. Only two of the schools defined as dual-track schools in the Carleton Board had immersion classes at the Grade 5 level in 1979, and both of these were included in the sample. In the case of the dual-track schools, comparison classes of regular English program students were selected from within the school. Comparison classes for the immersion centres were selected from regular English schools located in the same neighborhoods as the centres. School board officials provided information on the socioeconomic characteristics of the student populations to ensure the comparability of the subjects.

Instruments used in the study

The measures administered to the Grade 5 students in spring 1979 were the same (with one addition, the Second Language Student Survey) as those administered at the Grade 5 level in 1978 (see Andrew, Lapkin, & Swain, 1979). A detailed description of tests (a) to (d) below may be found in Swain and Barik (1977) and of tests (e) to (h) in Barik and Swain (1978). The tests measure cognitive ability, French and English language skills, work study skills, and achievement in mathematics and science. Tests (a) to (d) below were administered to all the Grade 5 students in the study, including the regular English program students:

(a) Canadian Cognitive Abilities Test (CCAT), Nonverbal Battery, Level C. This test was administered as a measure of IQ.

(b) Canadian Tests of Basic Skills (CTBS), Level 11. This test supplies a range of measures of English language skills, work-study skills, and mathematics.

(c) Metropolitan Achievement Tests (MAT): Science, Intermediate level. This test assesses achievement in science.

(d) English Story Completion (Cloze) Test, Level C³ This test is a measure of overall language proficiency (see Lapkin & Swain, 1977).

The following four French tests were administered to the Grade 5 immersion students only:

(e) Test de compréhension auditive, Niveau A.⁴ This test, developed by the Bilingual Education Project, measures the comprehension of spoken French as used in a number of real-life situations.

(f) Test de compréhension de l'écrit, Niveau A.⁵ Also developed by the Bilingual Education Project, this test assesses the comprehension of written French in items taken from a variety of written contexts.

(g) Test de mots à trouver, Niveau D.⁶ This is a cloze procedure test in French similar to the English Story Completion (Cloze) Test, (d) above. It provides a measure of overall French-language proficiency.

(h) Test de rendement en français, 5e (1973-74 edition). This is a measure of general achievement in French. The test was administered in May 1979 to the Grade 5 immersion pupils. The results are thus not directly comparable with those of the native French-speaking norming population in Montreal to whom the test was administered in November.

In addition to the above measures, a questionnaire was administered to the Grade 5 immersion students taking part in the study in 1979, and to those Grade 6 Carleton immersion students who had been tested at the Grade 5 level the previous year. This questionnaire is described below.

Second Language Student Survey: Four research teams co-operated in the development of this questionnaire: a team headed by Dr. H. P. Edwards of the University of Ottawa responsible for the evaluation of the bilingual programs in the Ottawa Roman Catholic Separate School Board, the Bilingual Education Project, the FRENCH Project of the Research Centre of the Ottawa Board of Education, and Dr. C. McInnis and Ms. E. Donoghue responsible for evaluating the immersion program in the Carleton Roman Catholic Separate School Board. The questionnaire seeks information in English about home and school exposure to French, the students' use of French in and out of school, and attitudes to French and French speakers. Students respond to questions by marking an X in the appropriate box on a five-point scale: for example, concerning the frequency of use of French outside school — "Never," "Hardly ever," "Sometimes," "Quite frequently," "Daily."

Two kinds of questionnaires were administered to the staff of the seven schools in the study: a teacher survey and a principals' survey. Both

questionnaires were designed expressly for this school environment study by the Bilingual Education Project.

Teacher Survey: Available in both English and French, the questionnaire seeks detailed information about various aspects of the school environment, the teachers themselves, and their experience with the immersion program. Included are questions concerning the individual's teaching experience, his or her language background, the availability of program resources, satisfaction with the immersion program, and the use of French in the school.

Principals' Survey: Designed for principals and vice-principals, this questionnaire contains many of the same questions as the teacher survey, but also includes some questions related to the school as a whole and the administration of the immersion program.

Immersion students' achievement results: Centres vs. dual-track schools

Comparisons were made on the various tests of French and English language skills, work-study skills, mathematics and science between the Grade 5 immersion centre students and the immersion students in the dual-track schools. The statistical technique used for these comparisons was a one-way analysis of covariance, using IQ as the covariate.

The results of the comparisons are presented in Tables 2 and 3. Included are both the unadjusted means for each test administered, and the adjusted means for each measure (based on the analysis of covariance with IQ as the covariate). The test of significance for age and IQ is based on the analysis of variance; otherwise all the tests of significance shown are based on the adjusted means for each measure.

Age and IQ. The average age of the immersion centre students was not statistically significantly different from that of the immersion students in the dual-track schools. Nor was the average IQ of the immersion centre students (106.1) significantly different from that of the dual-track immersion students (107.9).

French-language skills. However, as Table 2 shows, there were significant differences in the area of French-language skills. The adjusted mean scores of the immersion centre students were higher than those of the dual-track school immersion students on the Test de compréhension auditive ($p \leq .001$) and the Test de compréhension de l'écrit ($p \leq .05$). No significant differences were found on the Test de mots à trouver or the Test de rendement en français. These results are consistent with those reported for 1978, where two out of the three dual-track school immersion classes in the comparison were from a different board, rather than, as is the case here, from the same board.

English language skills. In addition, two of the language subtests of the Canadian Tests of Basic Skills⁷ show significant differences in favor of the immersion centre students: the vocabulary subtest ($p \leq .01$) and

TABLE 2
*Achievement Results in French: Immersion
Centres vs. Dual-Track School*

	Unadjusted Means						Adjusted Means (covs.=age,IQ)		
	Immersion Centres			Dual-Track Schools			Immersion Centres	Dual-Track	F ratio
	n	$\bar{X}$	SD	n	$\bar{X}$	SD	$\bar{X}$	$\bar{X}$	
Age (mos., June 1978 or 79)	141	130.46	3.91	104	130.01	3.95			.79
Cdn. Cog. Ab. Test (Stand. Age Sc.=IQ)	141	106.06	13.97	104	107.87	12.79			1.08
Test de com- préhension auditive	132	10.50	2.78	94	9.20	3.06	10.53	9.39	13.19**
Test de com- préhension de l'écrit	135	10.70	3.86	99	9.92	3.96	10.79	9.79	4.35*
Test de mots à trouver	133	13.41	3.56	97	13.10	3.36	13.47	13.02	1.01
Test de rendement en français ^a	68	18.59	5.28	66	17.30	4.83	18.54	17.36	2.12

^a This test was administered in May to the 1978-79 Grade 5 classes. Since this administration time differed from that of the 1977-78 classes (November 1977), the latter are not included in the analyses.

* $p \leq .05$.

** $p \leq .01$.

the reading subtest ($p \leq .01$) (see Table 3). No other significant differences in English-language skills were found between the immersion centre students and those in the dual-track schools. These results are somewhat less far-reaching than the 1978 findings in which significant differences favoring the immersion centre students were also found on two other CTBS measures of English: usage and language total.

Science, mathematics, and work-study skills. There were no significant differences between the dual-track students and the immersion centre students on the measures of science, mathematics, and work-study skills (see Table 3). These results are different from those reported for 1978, where significant differences favoring the immersion centre students were noted in all three areas.

TABLE 3
Achievement Results in English: Immersion Centres vs. Dual-Track Schools

	Immersion Centres			Unadjusted Means			Dual-track Schools		Adjusted Means (cons. = age, IQ)		
	<i>n</i>	$\bar{X}$	<i>SD</i>	<i>n</i>	<i>SD</i>		$\bar{X}$	<i>SD</i>	Immersion Centres $\bar{X}$	Dual-track Schools $\bar{X}$	<i>F</i> ratio
Age (mos., June '78 & May '79)	141	130.46	3.91	104			130.01	3.95			.79
Cdn. Cog. Ab. T. (Stand. Age Sc. = IQ)	141	106.06	13.97	104			107.87	12.77			1.08
CTBS											
Grade equivs.											
Eng. Skills:											
a) Vocab.	111	6.66	.92	99			6.28	1.14	6.67	6.27	8.96*
b) Read. comp.	111	6.45	.92	100			6.15	1.02	6.46	6.13	8.44*
c) Spelling	110	6.54	1.04	101			6.42	1.08	6.55	6.43	.78
d) Capitalization	110	6.07	1.19	102			6.34	1.09	6.08	6.31	2.18
e) Punctuation	110	6.53	1.31	102			6.56	1.10	6.55	6.53	.03
f) Usage	110	6.47	.96	101			6.31	1.09	6.49	6.28	2.58
g) Lang. Tot. (c-f)	110	6.41	.95	100			6.41	.90	6.43	6.39	.10
Math Skills:											
h) Concepts	112	6.60	1.13	96			6.46	1.00	6.61	6.45	1.52
i) Prob. Solv.	112	6.20	1.09	97			6.16	1.18	6.21	6.14	.24
j) Maths. Tot. (h-i)	112	6.41	1.01	96			6.32	.98	6.42	6.30	.96
Work Study Skills:											
k) Map read.	111	6.32	.93	96			6.20	.89	6.33	6.20	1.16
l) Graphs & Tables	111	6.61	1.11	99			6.54	1.17	6.63	6.50	.78
m) Use ref. mat.	111	6.40	.95	96			6.19	1.05	6.41	6.18	3.08
n) Wk. Study Tot. (k-m)	110	6.44	.87	93			6.31	.88	6.45	6.29	2.23
o) CTBS Comp. Sc. (a.b.g.j.n.)	103	6.47	.84	81			6.33	.86	6.49	6.30	2.96
MAT Science (st. score)	136	83.87	8.20	101			83.88	8.36	84.06	83.62	.19
Eng. Story Compl. (max = 41)	138	18.09	3.91	100			18.76	4.01	18.21	18.59	.63

* $p \leq .01$.

Achievement results: Dual-track vs. Regular English program

In order to determine whether the results of the immersion centre versus dual-track school comparison meant that the dual-track school immersion students were not performing satisfactorily in English in relation to their peers in the regular English program, a further comparison between the dual-track school immersion students and the regular English program students was made on all but the French tests. This comparison was again based on a one-way analysis of covariance, using IQ as covariate. There were no statistically significant differences on the initial analysis of variance for age and IQ. Moreover, no significant differences were found between the regular English program students and the dual-track immersion students on any of the achievement measures given in English, mathematics, science, or work-study skills.⁸

INTERPRETATION OF ACHIEVEMENT RESULTS

The superior performance of the immersion centre students compared with the dual-track school immersion students on several measures of French and English skills suggests confirmation of the notion that there is an immersion centre phenomenon to be explained. At the same time, there is no evidence to suggest that the general school achievement of the dual-track immersion students may be suffering in relation to that of the regular English program students. Both immersion centre students and the immersion students in the dual-track schools appear instead to be reaping substantial benefits from the immersion program in terms of the amount of French they have learned. The benefits appear to be greater for the immersion centre students, however, not only in French-language skills but in some aspects of English as well.

Analysis of questionnaires

Data from the staff and student questionnaires, along with additional factual information from the schools and the board, will be used to describe differences between the immersion centres and the dual-track schools that may have some bearing on the differences in achievement that have been found. Of the 94 questionnaires sent out to staff at the immersion centres and dual-track schools, 66 were returned altogether (70%). The proportion of returns from the dual-track schools was not as high as that from the immersion centres. While 48 of the 61 immersion centre staff members surveyed (79%) returned their questionnaires, the returns in the two dual-track schools totalled 18 out of 33 (55%).⁹ For a breakdown of questionnaire returns for the various categories of staff, see Table 4. In view of the complex nature of the staff questionnaires in which comments were invited, and the different numbers of staff involved in the five immersion centres and the two dual-track

TABLE 4
Questionnaire Returns for Staff Survey

<i>Staff Category</i>	<i>Immersion Centres</i>	<i>Dual-Track Schools</i>
Principals and vice-principals	5/7 (71%)	3/4 (75%)
Immersion homeroom teachers	20/22 (91%)	7/9 (78%)
Teachers of English to immersion students	10/13 (77%)	1/4 (25%)
Reg. English program teachers	2/4 (50%)	4/7 (57%)
Others	11/14 (79%)	3/9 (33%)
Total no. of questionnaires sent	61	33
Total no. of returns	48 (79%)	18 (55%)

schools, it was considered inappropriate to conduct statistical comparisons of responses on these questionnaires. Caution should also be exercised in relating the findings of the staff questionnaires directly to the students' achievement results, in that the number of students tested differed from school to school, while the staff questionnaire results are reported as an average of the immersion centres versus the dual-track schools, giving equal weight to each school.

The Second Language Student Survey was administered in school and results are based on a sample of about 200 immersion students, with roughly equal numbers from the immersion centres and the dual-track schools. The comparison between immersion centre students and those in the dual-track schools was carried out using a one-way analysis of variance for all the items analyzed.

French-language skills

A number of factors were considered that might be relevant to enhanced French achievement in an immersion program.

Use of French in school. The first question to be investigated was whether there is more French used in the school environment in immersion centres than in dual-track schools.

Initial information was sought from the board and the principals concerning the proportion of immersion classes to regular classes that existed in each school where the Grade 5 immersion classes were tested in 1978

and/or 1979. It will be recalled that the board definition of an immersion centre is that it is already, or is in the process of becoming, a school in which only the immersion program is offered. Of the five immersion centres in the study, three schools were found to be still offering a regular English program to a few classes at the upper grade levels. Overall, however, the proportion of French immersion to regular English classes in the immersion centres (varying from 82% to 100%) was substantially higher than that in the dual-track schools (47% to 68%), suggesting a stronger emphasis on French immersion in the immersion centres.

Information obtained from class lists revealed that the proportion of the daily program taught in French in the immersion centres was, however, actually less than that in the dual-track schools. In the immersion centres, the proportion of French in the program averaged approximately 60% in 1979 versus an average of approximately 70% in the immersion program of the dual-track schools. This surprising finding might lead one to expect an advantage in French achievement for the immersion students in the dual-track schools rather than for those in the immersion centres.

In addition, findings from the staff and student questionnaires provided little evidence that the immersion centre students were speaking French (i.e., using French productively) to a greater extent than the dual-track students in school contexts.

When asked how often they used French during French classes when talking with the teacher, the dual-track school immersion students reported a more frequent use of French in these circumstances than the immersion centre students did ($p \leq .01$). In other circumstances in the classroom and around the school, there were no significant differences in the amount of French the two groups of students claimed to use. These results are presented in Table 5.

Homeroom teachers were also asked to estimate the amount of French used by their students in various in-school contexts, using a 3-point scale: "Often," "Sometimes," or "Never." Table 6 reports the proportion of immersion homeroom teachers in the immersion centres versus those in the dual-track schools who responded in each of the "Often," "Sometimes," "Never," or "No opinion" categories. Differences suggesting more use of French by the immersion students in immersion centres were found in only three out of seven contexts: when speaking to classmates out of class and to other students in the school, and when speaking to members of the staff other than their homeroom immersion teacher (see Table 6). These results thus provide some indication that there may be, on average, more French spoken by immersion centre students in certain out-of-class contexts than in the dual-track schools.¹⁰ Within the classroom, however, where differences are found, these appear in general to slightly favor the dual-track school students over the immersion centre students.

TABLE 5
*Use of French in School According to Immersion
Students (responses on 5 point scale)^{a b}*

		<i>n</i>	$\bar{X}$	<i>SD</i>	<i>F</i>
During French classes, talking with the teacher	IC	90	4.40	.93	6.97*
	DT	70	4.74	.63	
During French classes, talking informally with other pupils	IC	89	3.07	.96	2.85
	DT	70	3.33	.97	
At school, between classes, or at lunch	IC	87	1.87	1.01	1.51
	DT	70	2.09	1.15	

^a 1=never; 2=hardly ever; 3=sometimes; 4=about half the time; 5=most or all of the time.

^b One immersion centre class and one dual-track school immersion class were omitted from this particular analysis because these two classes had been tested in 1978 and had since moved on to other schools where they received the questionnaires in 1979. It was felt that their responses to these questions would reflect the situation in their new schools rather than that in the schools taking part in the study which they had attended the previous year.

* $p \leq .01$.

Concerning the amount of French to which the students are exposed in the school context (their receptive use of French), there is evidence from the staff questionnaires to suggest that the immersion centre students may be getting, on average, more exposure to spoken and written French in the school environment than are the dual-track school students. This is an interesting finding, given that it is precisely on tests of receptive skills in French (listening and reading comprehension) that the Grade 5 immersion centre students were, on average, doing better than the immersion students in the dual-track schools.

Table 7 shows the proportion of material displayed in various school contexts that, according to staff members, is French or French-oriented, together with the estimated proportion of school events that take place in French. This table indicates that, according to staff estimates, there is, on average, more French material displayed in immersion classrooms, in the corridors, and in school on parents' night in the immersion centres than there is in the dual-track schools. In addition, a higher proportion of school assemblies, sports days, and announcements are estimated to take place in French in the immersion centres. That there may be considerable variation between immersion centres is, however, suggested by the comment of one respondent to the Principals' Survey, who provided as a general response to the question of how often students were using French in that school: "French is largely confined to the classroom."

TABLE 6
*Immersion Homeroom Teachers' Percentage Estimates of
Students' In-school Use of French^a*

<i>Students' Use of French When Speaking</i>	<i>School^b</i>	<i>Never</i>	<i>Sometimes</i>	<i>Often or Always</i>	<i>No Opinion</i>
To responding teacher in class	IC DT		4	89 100	7
To responding teacher outside class	IC DT		4	85 100	11
To other teachers in lessons taught in French	IC DT	4	4 10	92 90	
To other students in lessons taught in French	IC DT	4	26 25	70 75	
To other students otherwise in class	IC DT	11	37 35	52 65	
To classmates outside the classroom	IC DT	8 25	74 65	14 10	4
To other pupils in the school	IC DT	19 60	71 30	10	10
To other members of school staff	IC DT	4	21 70	61 30	14

^a The percentage of teachers responding in each category was averaged for each school, and the school averages were then used to arrive at overall means in each category for immersion centres and dual-track schools.

^b IC=Immersion Centre (*n*=20) ; DT=Dual Track (*n*=7).

Overall, however, it appears that, according to staff members, there is more exposure to French in the wider school environment of the immersion centres than in the dual-track schools.

Staff characteristics. To explore the possibility that there may be staff characteristics that could be relevant to the enhanced French achievement of immersion students in the immersion centres, the teaching experience of immersion homeroom teachers and the language background of various categories of school staff were examined.

It appears that the average minimum years of experience for the responding homeroom immersion teachers in the immersion centres is about one year more than for those in the dual-track schools, with a number of those in the immersion centres reporting a minimum of more than four years of experience as homeroom immersion teachers. To the extent that years of experience in the role of homeroom immersion teacher may be considered a factor in the students' achievement in French, these tentative results would thus tend to favor French achievement in the immersion centres.

TABLE 7

*Percentage of School Events in French, According to Staff^a
Percentage of French or French-oriented Material Displayed and*

	<i>Immersion Centres</i>	<i>Dual-Track Schools</i>
<i>Material displayed:</i>		
In immersion classrooms	92/97	44/55
In corridors	68	44
In school on parents' night	60	48
<i>School events:</i>		
School assemblies	54	37
Sports days, etc.	48	23
Announcements	33	30

^a An average estimate for each category of staff was first obtained for each school, supplying a weighted average by individual school. School averages were then used to arrive at an overall mean for immersion centres versus dual-track schools. Except for the first item, the categories of staff used were: immersion home-room teachers, teachers of English to immersion students, other teachers, and (vice-) principals.

With respect to the language background of staff, all the homeroom immersion teachers surveyed in both the immersion centres and the dual-track schools reported that they spoke French very well or as a native speaker. There were differences, however, between the self-reported skills in English of the immersion centre homeroom immersion teachers and those of their counterparts in the dual-track schools. Responses suggested that the immersion homeroom teachers in the immersion centres may, on average, have more advanced skills in English than those in the dual-track schools. Such a finding could be relevant to achievement in French, in that greater competence in English on the part of immersion teachers may facilitate communication with parents and English-speaking staff, and thus help to create a more favorable attitude towards the immersion program.

There was no evidence from the teacher questionnaires to suggest that librarians, French remedial teachers, or specialists in the areas of music, art, and physical education were, on average, more competent in French in the immersion centres than in the dual-track schools. However, the self-ratings in French of the principals and vice principals were, in general, somewhat higher in the immersion centres than in the dual-track schools, with 75% of the responding immersion centres having a principal or vice-principal who claimed to speak French "fairly well" or better, while neither of the dual-track schools did (although one dual-track school respondent indicated that his French-speaking ability lay between the "fairly well" and "can get by" categories). These findings with re-

spect to principals and vice-principals may help to account for the somewhat higher proportion of French apparently used at school events in the immersion centres.

Assessment of resources in French. A further factor that might help to enhance the achievement in French of immersion students is the availability of suitable material resources in French. While there is no evidence from the teacher questionnaire to suggest that the availability of resources in the Carleton Board of Education is, in fact, any different for immersion centres than it is for the dual-track schools, there appears to be considerably more satisfaction with basic subject programs and library resources in French by homeroom immersion teachers in the immersion centres than there is in the dual-track schools. Table 8 shows that in each of the basic subject areas of French language arts — mathematics, science, and social studies — there was on average a much more favorable assessment by homeroom immersion teachers in the immersion centres than there was in the dual-track schools. In addition, immersion homeroom teachers in the immersion centres appear in general to be slightly more satisfied with the library resource centre materials in French. However, in neither type of school did the majority (averaged by school) appear to feel that the library resources in French were sufficient for their students' needs.

TABLE 8
Percentage Assessments of Basic Subject Programs and/or Materials Available in Subjects Taught by Immersion Homeroom Teachers^a

	<i>Immersion Centres</i>	<i>Dual-Track Schools</i>
<i>French-language arts</i>		
Adequate and suitable	77	30
Not enough and/or not suitable	23	70
<i>Mathematics</i>		
Adequate and suitable	90	40
Not enough and/or not suitable	10	60
<i>Science</i>		
Adequate and suitable	42	13
Not enough and/or not suitable	58	87
<i>Social Studies</i>		
Adequate and suitable	51	13
Not enough and/or not suitable	49	87

^a An average of responses per school was obtained, from which an overall mean was calculated for immersion centres versus dual-track schools.

In sum, the different assessments of the available French resources in immersion centres and dual-track schools by the immersion homeroom teachers suggest that the availability of suitable materials may be a factor in the enhanced French achievement of the immersion centre Grade 5 pupils.

Attitudes of staff. Favorable attitudes of teachers and principals towards a second-language program have previously been shown to be positively associated with achievement in that program (see, for example, Burstall et al., 1974). When asked to specify whether they would prefer to teach early French immersion in an immersion centre or a dual-track school, homeroom immersion teachers unanimously chose the immersion centre.¹¹ This suggests that the dual-track school immersion homeroom teachers are not as satisfied about teaching in the immersion program in their schools as are their counterparts in the immersion centres. When asked to describe the atmosphere in their schools, 44% of staff in the immersion centres indicated that there was a compatible mix, or made a positive comment, compared with 30% in the dual-track schools. Positive comments in the immersion centres included: "Very conducive for learning in general and learning French in particular"; "A French immersion centre with a strong commitment to French and supported fully by the parents." In addition, more staff in the dual-track schools indicated that they felt the atmosphere was segregated (17% versus 5% in the immersion centres). One comment on the Teacher Survey about an immersion centre where the regular English program was still in the process of being phased out suggests that this process can cause a certain amount of tension in the school: "Problems are occurring between staff because of redundancy at school level brought about by the growth of the immersion program."

Principals and vice-principals were asked to indicate which administrative areas associated with running an immersion program created more difficulty than would be the case for a non-immersion program.¹² In the immersion centres, there was an average of five such difficult administrative areas reported per school versus an average of seven such areas in the dual-track schools. Most frequently mentioned areas of difficulty in the immersion centres were: getting basic programs established, and getting resource materials. That these areas of difficulty are being effectively grappled with is suggested by the greater satisfaction of the homeroom immersion teachers in the immersion centres. In the dual-track schools, the most frequently mentioned areas of administrative difficulty were: staff relations, parents' demands, bussing and other transportation, and crowding in the school. When asked to what extent the administrative work was justified in relation to the value of the program, 100% of the dual-track school respondents to the Principals' Survey indicated that it was "justified," compared with 40% of the immersion centre respondents who felt that the work was "more than

compensated for," 40% who considered it "justified," and 20% who considered the work "too much" in relation to the value of the program.

Overall the findings from the staff questionnaires suggest that there is in general a somewhat more favorable attitude towards the immersion program among the staff in the immersion centres than there is in the dual-track schools. This factor may be contributing to the enhanced French achievement of the immersion centre students.

Use of French outside school. The possibility that the immersion centre students' superior performance on the French listening and reading comprehension tests might also be explained by greater exposure to and use of French outside school was also investigated. A number of questions on the Second Language Student Survey were relevant to this issue. The students' responses to these questions (see Table 9) appear to indicate that the dual-track school immersion students are using French outside school at least as often as their peers in the immersion centres. In only one instance was there a significant difference between the two groups of students: namely, in the reported use of French with Francophones in the community. The dual-track students reported more use of French in this outside-school context than did the immersion centre students. The perceptions of the immersion homeroom teachers tended to confirm the self-reports of the students. There is no evidence from the immersion teachers' responses to the teacher survey to suggest that immersion centre students are, on average, being exposed to more French television, radio, or magazines outside school than are the dual-track school immersion students, or that the immersion centre students have more Francophone playmates.

Parental characteristics. Also considered was the possibility that more favorable parental characteristics might help to account for the enhanced achievement in French of the immersion centre students. According to the responses on the Second Language Student Survey, the parents' French skills and level of education were, on average, essentially the same for the two groups of immersion students.

According to the homeroom immersion teachers, there were no substantial differences in parental attendance at school meetings that might indicate higher motivation by parents of students in the immersion centres. Higher parental motivation in the immersion centres might, however, be indicated if substantially more immersion students have to be bussed to school in the centres than in the dual-track schools. Based on figures supplied by respondents to the Principals' Survey, an average of 74% of the immersion students are bussed to school in three of the five immersion centres (no data are available on the other two immersion centres), while an average of about 69% of the immersion students in the two dual-track schools are bussed to school.¹³ In the view of half the respondents to the Principals' Survey, bussing of children does indicate higher motivation on the part of parents. These results thus tenta-

TABLE 9
*Outside-school Use of and Exposure to French of Immersion Centre
Students and Immersion Students in Dual-Track Schools^a*

	<i>School</i>	<i>n</i>	$\bar{X}$	<i>SD</i>	<i>F</i>
1. Use of French by student:					
At home with relatives	IC	102	2.27	1.06	2.41
	DT	94	2.52	1.16	
Talking with friends outside of school	IC	101	1.64	.91	.08
	DT	94	1.68	.99	
With Francophones in the community	IC	102	2.59	1.42	7.76*
	DT	94	3.15	1.40	
2. Use of French in the home	IC	102	2.45	.90	2.01
	DT	93	2.63	.91	
3. No. of fluent French speakers in the home	IC	103	2.83	1.34	1.60
	DT	94	2.59	1.32	
4. Amount of:					
French TV Programs watched	IC	101	1.50	1.03	.36
	DT	93	1.58	.97	
French radio programs listened to	IC	99	1.37	.93	1.27
	DT	91	1.54	1.08	
French newspapers read outside school	IC	103	2.42	1.08	.24
	DT	94	2.49	.96	
5. Opportunity to use French outside school	IC	103	3.15	1.13	.05
	DT	94	3.18	.99	

^a Responses were given on a five-point scale in which 1=low and 5=high. For questions 1 and 2 the choices were: "Never," "hardly ever," "sometimes," "about half the time," "most or all of the time." For question 4, the choices were: "Less than 1/2 hour per week," "1/2 hour to 1 hour per week," "1 1/4 to 3 hours per week," "3 1/4 to 6 hours per week," "more than 6 hours per week." For question 5, the choices were similar to those for questions 1 and 2.

* $p \leq .05$.

tively suggest that a very slightly higher proportion of parents in the immersion centres than in the dual-track schools may be particularly strongly committed to the immersion program. However, according to one immersion centre respondent: "A French immersion centre may not meet the needs of a local community. Many people send their children to us, not because of a commitment to the program, but because we are the closest school." This suggests that some parents in the immersion centres may be less committed to the immersion program than those in

the dual-track schools, in that they could be enrolling their children in the program mainly in order to avoid bussing them to a regular school further away. In a dual-track school, they might have opted instead for the regular English program. On balance, then, it seems that the overall commitment of parents to the immersion program, as suggested by bussing trends, may not be significantly greater in the immersion centres than in the dual-track schools.

Summary. In sum, it appears from the questionnaires that the higher achievement in French listening and reading comprehension of the immersion centre students is more closely associated with a number of factors in the school environment itself than with factors such as home background, parental motivation, or outside school exposure to French. From the questionnaire data, it would appear: (a) that the receptive use of French may be greater in some contexts in the immersion centres; (b) that the immersion homeroom teachers in the centres may be slightly more experienced in that role, and (c) that they are in general better satisfied with the resources available for subjects taught in French. In addition, the attitudes of staff appear slightly more favorable towards the program in the immersion centres than in the dual-track schools.

English language skills

The enhanced English skills of the immersion centre students as measured by the CTBS in the areas of vocabulary and reading may be influenced by the fact that the immersion centre students are on average getting a higher proportion of English language instruction in the program than are the immersion students in the dual-track schools (approximately 40% versus 30%). However, it may be noted that the higher average amount of French in the immersion program of the dual-track schools was not positively associated with achievement in French. Also, the difference becomes minuscule if one considers total exposure to English in and out of school. It seems appropriate, therefore, to consider what other factors may be contributing to the immersion centre students' enhanced achievement in English. One of these factors may be the staff attitudes to the immersion program, already considered as a factor in French achievement. Another factor may be experience of teachers in teaching English-language arts to immersion students. Unfortunately, there was insufficient questionnaire data from the dual-track schools to provide any reliable information on this question. The suggestion made by Cummins (1979) is another factor to be considered. It could be that the enhanced French achievement of the immersion centre pupils has a positive effect on their achievement in the mother tongue. While this interesting hypothesis remains to be more rigorously tested, it receives some tentative support from the findings of this study.

CONCLUSION

In conclusion, there is evidence to suggest that immersion centres foster enhanced achievement in some aspects of French- and English-language skills relative to dual-track schools. The data collected in the context of these two types of schools in the Carleton Board of Education suggest several possible reasons for these differences: (a) greater receptive use of French in some contexts in the immersion centres; (b) slightly more experience as homeroom immersion teachers by the immersion teachers in the centres; (c) greater satisfaction in the immersion centres with resources available for subjects taught in French; (d) slightly more favorable staff attitudes towards the immersion program in the immersion centres than in the dual-track schools; and (e) a possible positive interaction between enhanced second-language ability and skills in the mother tongue.

The overall implication of this study for program planning is to focus on teachers' needs in materials and resources, and to encourage the maximum use of French in the school setting, whether it be an immersion centre or a dual-track school.

NOTES

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¹ Students in the early immersion program in the Carleton board are instructed entirely in French for the first two or three years of schooling (K to 1 or 2). In Grade 2 or 3, one hour of English-language arts is introduced, so that 80% of the school day is allotted to instruction in French and 20% to English through to Grade 5. In Grade 5, one additional subject is often taught in English for a 65%/35% split between the languages of instruction, and from Grade 6 on there is an equal amount of instruction in each language.

² These tests are described below.

³ Formerly English Story Completion (Cloze) Test, Level 6.

⁴ Formerly Test de compréhension aurale, niveau 6.

⁵ Formerly Test de compréhension de l'écrit, niveau 6.

⁶ Formerly Test de mots à trouver, niveau 6.

⁷ In one of the immersion centres, the CTBS was administered under different circumstances at a different time of year. The results from this school have therefore not been included in the analyses.

⁸ When a similar comparison was made between the immersion students in immersion centres and regular English-program students, differences favoring the immersion centre students were found in English (spelling, $p. \leq .05$; usage, $p. \leq .01$), work-study skills (reference materials, $p. \leq .05$; work-study total, $p. \leq .05$), and the CTBS composite score, $p. \leq .05$.

- ⁹ This difference in return rates from the immersion centres and the dual-track schools may be considered a finding in itself. It suggests that there may be more interest in the immersion program on the part of the staff as a whole in the immersion centres.
- ¹⁰ In a study conducted by the Research Centre of the Ottawa Board of Education questionnaires were administered to teachers in both school settings to provide information on the use of French in out-of-class contexts. Teachers in immersion centres reported more student use of French at recess, lunch, and school-wide activities than did immersion teachers in dual-track schools (Parkin, 1979).
- ¹¹ In a similar vein, Parkin (1979) reports that 86.6% of the teachers responding to the questionnaire (see note 10) feel that centres are more advantageous for teaching French than are dual-track schools.
- ¹² For a Superintendent's view of administrative difficulties associated with implementing early immersion programs, see McGillivray (1979).
- ¹³ Figures for the dual-track schools refer to the 1979-80 school year, while figures for the immersion centres are based on the 1978-79 school year.

REFERENCES

- Andrew, C. M., Lapkin, S., & Swain, M. *Report on the 1978 evaluation of the Ottawa and Carleton French immersion programs, grades 5-7*. Toronto: Ontario Institute for Studies in Education, 1979.
- Andrew, C. M., Lapkin, S., & Swain, M. *Report on the 1979 evaluation of the Ottawa and Carleton French immersion programs, grades 6 and 8*. Toronto: Ontario Institute for Studies in Education, 1980.
- Barik, H. C., & Swain, M. Three-year evaluation of a large scale early grade French immersion program: The Ottawa study. *Language Learning*, 1975, 25, 1-30.
- Barik, H. C., & Swain, M. French immersion in Canada: The Ottawa Study through grade four. *ITL, A Review of Applied Linguistics*, 1977, 36, 45-70.
- Barik, H. C., & Swain, M. Evaluation of a French immersion program: The Ottawa Study through grade five. *Canadian Journal of Behavioural Science*, 1978, 10(3), 192-201.
- Burstall, C., Jamieson, M., Cohen, S., & Hargreaves, M. *Primary French in the balance*. Slough, Berks.: National Foundation for Education Research, 1974.
- Cummins, J. Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, 1979, 49, 222-251.
- Lapkin, S., & Swain, M. The use of English and French cloze tests in a bilingual education program evaluation: Validity and error analysis. *Language Learning*, 1977, 27(2), 279-314.
- MacNab, G., & Kirby, D. M. Home background of students varying in French proficiency. *FRENCH Working Paper No. 28*, Research Centre, Ottawa Board of Education 1975.
- McGillivray W. R. Administrative problems of early immersion. In B. Mlacak & E. Isabelle (Eds.), *So you want your child to learn French!* Ottawa: Canadian Parents for French, 1979.
- Parkin, M. *But do they speak French?* Ottawa: Research Centre, Ottawa Board of Education, 1979.
- Swain, M. French immersion: Early, late or partial? *The Canadian Modern Language Review*, 1978, 34, 577-585.
- Swain, M. *Target language use in the wider environment as a factor in its acquisition*. Paper presented at the 13th Annual TESOL Convention, March 1979.

- Swain, M., & Barik, H. C. A large scale program in French immersion: The Ottawa Study through grade three. *ITL, A Review of Applied Linguistics*, 1976, 33, 1-25.
- Swain, M., & Barik, H. C. *Report to Ottawa Board of Education and Carleton Board of Education re: Evaluation of the 1976-77 French immersion program in grades 4-6*. Toronto: Ontario Institute for Studies in Education, 1977.
- Swain, M., & Bruck, M. (Eds.). Proceedings of the research conference on immersion education for the majority child. *The Canadian Modern Language Review*, 1976, 32(5), 490-626.
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