

# Linguistic Factors in Second-Language Loss\*

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This study investigated the nature of the linguistic features lost in oral French over the summer vacation period by 89 English speaking Grade 9 students. These students had been studying French in a regular second-language program since Grade 6 and had completed an average of 120 hours of instruction. Global analyses revealed significant reductions in total time, speaking time, number of pauses, quantity of production and grammatical accuracy on tasks requiring production of discourse, suggesting a general deterioration in language proficiency. There was, however, no significant reduction on tasks requiring production of individual vocabulary items. A more molecular analysis focused on the use of various grammatical structures and specific parts of speech. The results of this latter analysis indicated that losses take place in most grammatical elements, but that effects were most pronounced for those elements that were learned most recently. These results were discussed and contrasted with first-language loss where vocabulary elements appear to suffer loss before grammatical forms.

## INTRODUCTION

In 1982, Lambert and Freed published the reports of a conference organized to discuss the loss of language skills. As indicated in those reports and by an annotated bibliography included in that publication, it is evident that relatively little research has been conducted on the loss of second-language skills that result during the summer vacations of students of a second language. This is somewhat surprising in that many teachers spend the first few classes of a new term reviewing material that may have been forgotten, and a solid data base on the types of skills that might be lost could be of use to them. Furthermore, there is an increased research interest in psychological factors such as attitudes and motiva-

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tion that might influence second-language loss, and information concerning the types of skills lost would be of use to researchers doing this type of investigation. Often, as indicated below, they tend to focus on rather global measures. Finally, by learning more about the nature of second-language skills lost in various contexts of disuse, educators and researchers might be able to develop a better understanding of processes operating in the acquisition of the language that they might strengthen to promote second-language retention. Since many students study second languages and then have little opportunity to use them for some considerable period of time after their courses end, there is an obvious practical value in this type of information.

The research that has been conducted on second-language loss has produced equivocal results. In a study involving 135 beginning German students at college, Scherer (1957) found evidence of loss only in grammar skills after the summer vacation. Since he gives only raw scores, however, it is impossible to tell whether the decrease is significant. In a later study, Smythe, Jutras, Bramwell and Gardner (1973) found significant decreases in French reaching comprehension among Grade 9 students (with approximately 90 hours of French instruction) following the summer vacation. In a second study, they reported significant increases after three months, but significant decreases after seven months on the Canadian Achievement Test in French for different classes of students in Grades 9, 10, and 11.

In a study comparing Spanish immersion pupils who continued some Spanish training in junior high school with those who did not, Snow, Padilla and Campbell (1984) found no significant differences between the groups for two years after completion of the immersion program, although the group not continuing to study Spanish in junior high school showed signs of attrition in the production skills, speaking and writing. However, after more than two years the group that did not continue studying Spanish had significantly lower proficiency in speaking, listening, reading and writing skills. In these studies, L2 proficiency was measured globally across the four linguistic skills. No attempt was made to isolate linguistic factors involved in L2 loss.

In a study investigating changes in oral proficiency over the summer holidays, involving 14 Grade 1 students enrolled in a Spanish immersion program, Cohen (1974) found that subjects made more grammatical errors after the summer recess and that their utterances had become shorter. In a follow-up study of three Grade 1 students, Cohen (1975)

found some evidence that most recently learned grammatical rules were forgotten first.

Gardner, Lalonde, Moorcroft and Evers (1985) attempted to determine the extent of vocabulary retention and grammatical accuracy in L2 writing skills of Grade 12 students following a three-month summer vacation. They found no significant decrease in quality of written production, either in free composition or in a task requiring students to list items belonging to a category (such as "vegetable"). There was, however a significant decrease of grammatical accuracy in free composition.

This paper examines the results of a study investigating changes in oral French proficiency of Grade 9 students. The measure of oral proficiency was designed to test the prediction that oral proficiency would show a significant decline over the summer holidays and, moreover, to isolate those linguistic factors showing the greatest decline.

## METHOD

### SUBJECTS

One hundred and fourteen Grade 9 students attending three different London, Ontario high schools were tested initially, though it was possible to retest only 89 of them. At the time of the first testing, subjects had completed an average of 120 hours of French instruction over a period of four years.\*

### PROCEDURES

Subjects were tested at the end of one academic year in June and retested during the first week of the next academic year in September before resuming their study of French. Oral proficiency was assessed by a tape-recorded test based on one developed by Burstall, Jamieson, Cohen and Hargreaves (1974), but substantially altered by the first author of this study. It consisted of two parts. In the first, prerecorded part, subjects were required to record answers to 11 questions. The questions were presented twice in French. Subjects answered within a fixed

\*We gratefully acknowledge the invaluable assistance of G. Jutras and M. Milhausen, French consultants of the London Board of Education who advised us on many matters and also arranged the testing sessions. We would like to thank the French teachers and the principals of the schools involved without whose cooperation this research would not have been possible.

period of time before the presentation of the next question was signalled by a tone on the tape, which they had been instructed to expect.

The second part consisted of ten tasks printed in a booklet, which subjects were instructed to complete at their own pace. Two of these tasks required subjects to produce vocabulary items; the other eight called for sentence responses. Each of these tasks asked the subject to imagine that he/she was communicating in a real life situation. These ranged in difficulty from a simple request for information, such as "ask someone where the post office is," to the relatively difficult "explain to your parents why you were two hours late coming home".

The structures and vocabulary required to answer the questions and to complete the tasks were limited to those covered by the subjects in class, as determined from textbooks and consultation with their teachers. Two forms, A and B, of the test were developed. Forty-nine subjects received test A in June and test B in September, while 40 subjects received them in the reverse order.

Subjects were tested with individual tape recorders, in a classroom, in groups of no more than ten. In order to minimize interference from other students during completion of the test, students listened to the questions through earphones and were asked to keep the earphones on while they were tape recording their responses to the tasks.

The completed tapes were coded so that the PRE- and POSTtests could not be distinguished, and each tape was transcribed. Using the transcript as a guide, aspects of the recorded material were also timed with a manual timer connected to a computer.

#### VARIABLES:

The following measures were derived from the oral productions:

- (1) Elapsed time, to the nearest tenth of a second, between the first and last utterance in response to each of the questions and tasks.
- (2) Speaking time, to the nearest tenth of a second, during the elapsed time.
- (3) Number of pauses between utterances.

For variables (1) and (3) scores were summed separately over questions and tasks providing subscores that were used to determine whether a time would affect losses in fluency differentially.

The transcripts were also scored by the senior investigator to measure the following variables:

- (4) Quantity of production was assessed by giving a score of one to every clause judged to be a successful communication. Grammatical accuracy was not taken into account in this measure. For example, in response to the question "*qu'est-ce que tu aimes manger, et pourquo?*", the sentence "*j'aime le mange le pomme*" would be counted as a successful communication.

- (5) Grammar. Each clause was rated for grammatical accuracy on a scale from one to three, with a point deducted for every major error. Bonus points, given for optional elements which were not necessary to make clauses grammatical, could raise the score to a maximum of three in spite of any major errors. Examples of optional elements would be verbal complements not required by the verbs, such as prepositional phrases used with intransitive verbs, or noun phrases used with intransitive verbs, or noun phrase modifiers. For instance, the sentence "*il aime jouer au tennis avec ses amis*" would receive a score of three in spite of the incorrect verb form "*aime*" because it also includes the optional elements "*au tennis*" and "*avec ses amis*".

Again scores were summed separately over questions and tasks in order to determine whether the time limit imposed on responses to the questions would affect a loss in grammatical accuracy and quantity of production differentially.

- (6) Vocabulary production was measured separately by two tasks requiring subjects to name items belonging to categories, such as "all things you might pack in a suitcase". Each correct item named was counted as one. Mistakes in gender of the article or absence of the article were not considered. The score for vocabulary production represents the sum of correct items produced in response to the two tasks.

The variables presented in Table 2 combine groups of grammatical structures listed under headings in Table 3. The following types of grammatical structures were measured:

- (7) Verb forms—present
- (8) Interrogative structures
- (9) Pronouns
- (10) Noun phrase modifiers
- (11) Quantifiers
- (12) Subordinating constructions

Table 1  
Total Scores for Quantity, Grammar and Time

Tasks	Mean		Standard Deviation		t-Value	Prob-ability
	Pre	Post	Pre	Post		
(1) Elapsed Time	1441.44	1077.03	940.48	651.91	4.07	0.001
(2) Speaking Time	407.72	328.35	255.08	189.90	3.55	0.001
(3) Number of Pauses	42.34	34.35	26.32	20.51	3.39	0.001
(4) Quantity	13.16*	10.97	7.56	6.18	3.27	0.002
(5) Grammar	23.36	19.26	16.45	12.96	2.88	0.005
Questions						
(1) Elapsed Time	686.78	537.09	448.86	366.49	3.22	0.002
(2) Speaking Time	315.67	241.81	214.17	153.17	3.88	0.001
(3) Number of Pauses	32.11	24.65	19.74	17.65	3.21	0.002
(4) Quantity	9.24	7.22	5.84	4.20	4.12	0.001
(5) Grammar	15.12	12.21	11.11	9.09	3.45	0.001
(6) Vocabulary	8.37	7.93	4.70	4.18	0.80	0.426
Production						

\*Values averaged across N = 89, including 0 scores by some subjects

(13) Proposition *à* used to introduce indirect objects and to indicate location

#### (14) Idioms

Each of the grammatical structures presented in Table 3 was scored as follows. Each accurate use of the grammatical structure was counted as one, considering separately the responses to each question or task. For example, an appropriate use of the form "j'aime" was counted separately for every question or task. This was done because each response dealt with a new communicative situation. For the same reason subsequent uses of the same form in response to one question or task were not scored. Grammatical elements were summed over responses to tasks and questions. The scores for related grammatical elements were added for the PRE- and POSTtests to produce the composite scores presented in Table 2.<sup>1</sup>

In order to measure the change in oral proficiency between June and September, scores for the PRE- and POSTtests of all the variables described were compared statistically by means of t-tests.

Table 2  
Sums of Grammatical Elements

	Mean		Standard Deviation		t-Value	Prob-ability
	Pre	Post	Pre	Post		
(7) Verb Forms-Present	9.11	7.22	5.64	5.10	4.06	0.001
(8) Interrogative Structures	5.69	4.20	3.42	2.46	4.35	0.001
(9) Pronouns	2.48	1.75	2.22	2.04	3.28	0.001
(10) Noun Modifiers	7.94	6.44	5.82	4.87	2.98	0.004
(11) Quantifiers	1.40	0.97	1.95	1.43	2.03	0.050
(12) Subordinating Constructions	3.31	2.48	2.76	2.25	3.34	0.001
(13) <i>à</i>	1.99	1.30	1.97	1.63	2.87	0.005
(14) Idioms	3.13	2.84	2.27	2.19	1.22	0.224
Totals	35.66*	27.91	21.46	17.59	5.12	0.001

\*values averaged across N = 89, including 0 scores by some subjects

## RESULTS AND DISCUSSION

The results of the comparisons on the first six variables over the summer vacation are presented in Table 1. They show significant declines in the quantity of clauses uttered, grammatical accuracy assessed globally for each clause, time spent speaking, elapsed time and number of pauses between utterances. Only vocabulary production did not show a significant decline. These results suggest that, at least over a short period of time, there is no significant decline in available vocabulary, but that there is a decline in the facility with which grammatical rules are applied. The observed decline in quantity (both in terms of grammatical units produced, clauses, and in terms of speaking time) may therefore not be related to the fact that subjects have less vocabulary available with which to construct sentences, but to the fact that they have more problems in using grammatical rules to link vocabulary in sentences.

All the t-tests comparing the timing variables show significant declines. Subjects spend significantly less time speaking, but also make fewer pauses. They also spend significantly less time uttering a significantly smaller quantity of clauses. Since speaking time, pauses, and elapsed time all decline to the same extent as the number of clauses uttered, it does not seem that a decline in fluency is responsible for the

Table 3

Grammatical Elements	Mean		Stan. Dev.		T-Tests	
	Pre	Post	Pre	Post	t Value	Prob.
<b>Verb Forms - present</b>						
Regular - 1 sg (87) <sup>1</sup>	2.79 <sup>2</sup>	2.76	1.95	1.95	0.10	0.92
- 2 sg/pl (79)	1.90	1.34	1.64	1.32	3.18	0.002
- 3 sg (46)	0.65	0.33	0.94	0.62	2.98	0.004
- 1 pl (8)	0.07	0.03	0.25	0.18	1.14	0.26
- 3 pl (32)	0.36	0.19	0.66	0.54	2.24	0.03
Irregular - <i>je veux</i> (54)	0.67	0.73	0.89	0.94	-0.57	0.57
- <i>'jai</i> (41)	0.46	0.26	0.64	0.67	2.20	0.03
- other (62)	1.37	0.73	1.57	1.11	4.15	0.001
<b>Verb Forms - compound</b>						
<i>passé composé - avoir</i> (47)	0.53	0.30	0.76	0.61	2.23	0.03
<i>passé composé - être</i> (8)	0.01	0.09	0.11	0.33	-2.15	0.03
Progressive future (35)	0.40	0.30	0.78	0.65	1.08	0.28
<b>Negation</b>						
Verb negation (73)	1.20	1.12	1.17	1.31	0.50	0.62
Verb negation + past (12)	0.11	0.02	0.32	0.15	2.37	0.02
						(0.01) <sup>3</sup>
<b>Interrogative Constructions</b>						
Inversion (83)	1.22	1.04	0.96	0.93	1.32	0.19
<i>est-ce que</i> (79)	1.56	1.24	1.10	0.91	2.98	0.004
Interrogative adverbs (86)	2.38	1.69	1.47	1.16	4.69	0.001
Inter. pronouns (13)	0.11	0.07	0.35	0.25	1.07	0.29
Inter. adjectives (38)	0.40	0.17	0.67	0.38	3.15	0.002
<b>Pronouns</b>						
3 Person subject (agreeing with antecedent) (70)	1.07	0.75	1.16	0.97	2.10	0.04
Object - use (53)	0.70	0.46	0.88	0.78	2.20	0.03
- position (23)	0.27	0.22	0.60	0.56	0.75	0.45
Deictic ( <i>ici, là</i> ) (23)	0.16	0.17	0.40	0.46	-0.18	0.85
Dummy subject <i>'il</i> (11)	0.11	0.03	0.38	0.18	1.72	0.09
<i>'il est certain que...</i>						
<i>'ont</i> (5)	0.03	0.02	0.18	0.15	0.45	0.66
<b>Noun Phrase Modifiers</b>						
Adjective (80)	2.24	1.87	2.06	1.69	1.64	0.10
- possessive (78)	1.61	1.42	1.44	1.30	1.17	0.24
- following <i>être</i> (72)	1.20	1.07	1.35	1.20	0.78	0.44
- comparative (6)	0.03	0.03	0.18	0.18	0	1.00
De + modifier (63)	1.00	0.73	0.99	0.95	2.37	0.02
De + possessor (15)	0.13	0.06	0.38	0.23	1.72	0.09
<i>à</i> + modifier (9)	0.07	0.03	0.25	0.18	1.00	0.32

Table 3 (continued)

Grammatical Elements	Mean		Stan. Dev.		T-Tests	
	Pre	Post	Pre	Post	t Value	Prob.
<b>Quantifiers</b>						
Partitive - m. (14)	0.06	0.15	0.23	0.49	-1.52	0.13
- pl. (37)	0.49	0.31	1.08	0.72	1.33	0.19
- <i>'tout</i> (8)	0.08	0.02	0.27	0.15	1.92	0.06
- other (41)	0.78	0.47	1.32	0.93	2.26	0.03
<b>Subordinating Constructions</b>						
Modal + infinitive (44)	0.62	0.55	1.10	0.87	0.62	0.54
Full verb + infinitive (69)	1.08	0.71	1.10	0.83	2.85	0.005
Conjunction + tensed verb (81)	1.27	1.09	0.82	0.97	1.75	0.08
Relative clauses (13)	0.17	0.04	0.43	0.33	2.47	0.02
Introduced by <i>'est...</i> (12)	0.15	0.09	0.56	0.33	1.00	0.32
<b>Adverbs (24)</b>	0.29	0.12	0.69	0.45	1.98	0.05
<b>Idioms</b>						
weather (75)	1.07	1.27	1.10	1.20	-1.52	0.13
<i>'il a sept ans</i> (20)	0.15	0.09	0.39	0.29	1.04	0.30
<i>'il a les yeux bleus</i> (16)	0.10	0.08	0.30	0.27	0.50	0.62
<i>'il étudie l'anglais</i> (42)	0.36	0.25	0.59	0.43	1.52	0.13
<i>'le Canada</i> (4)	0	0.06	0	0.28	-1.92	0.06
<i>'j'aime le chocolat</i> (76)	1.38	1.12	1.59	1.09	1.71	0.09
<i>'j'ai peur de...</i> (17)	0.07	0.13	0.25	0.38	-1.35	0.18
other (71)	1.39	0.97	1.47	1.15	2.47	0.02

<sup>1</sup>The number in brackets represents the number of subjects who produced the structure on either the pre or the post tests.

<sup>2</sup>All values are calculated for  $N = 89$ .

<sup>3</sup>The number in brackets represents the probability as calculated for the number of subjects who actually produced this structure, if the probability level is different, when calculated for only these subjects.

decline in quantity. Subjects spent less time and made fewer pauses uttering a small number of clauses.

A comparison of variables (7) through (14) over the summer vacation presented in Table 2 makes it possible to examine the nature of the

grammatical loss more closely. T-tests performed on sums of related grammatical elements show a more differentiated picture that helps to explain more completely the nature of the loss reflected in the global measures of quantity, grammatical accuracy, and vocabulary production.

The results of the t-tests comparing PRE- and POSTproduction of grammatical elements support our interpretation of the results of the t-tests comparing quantity, grammatical accuracy, and vocabulary production. Among the t-tests comparing PRE- and POSTproduction of grammatical elements presented in Table 2, the nonsignificant results of the t-tests comparing idiom production, contrast with the significant results of the other t-tests, which show a significant decline in production. Idioms differ from the other grammatical elements tested in that they are fixed forms. As such, they can be compared to vocabulary, and, like vocabulary, they are not forgotten, at least not over a short period of time. The t-tests comparing PRE- and POSTproduction of grammatical elements thus support the explanation for a general decline in quantity based on the findings presented in Table 1. Overall, production of clauses declines because grammatical structures involving the application of rules are less available after three months of not speaking French and not because lexical items are less available.

Because the results of the t-tests comparing production of grammatical elements all show significant declines, it is impossible to isolate any group of grammatical elements, other than idioms, as contributing or not contributing to the decline in quantity or grammatical accuracy of oral production, even though inspection of t-tests comparing the individual items in Table 3, combined under the headings in Table 2, suggests that some constructions are more vulnerable to loss than others. However, the t-tests comparing individual grammatical elements almost all show loss, even though in some cases it is not significant. It seems likely, therefore, that the differences between the results of t-tests comparing sums of related grammatical elements and those comparing individual structures are due to the fact that, in the case of individual elements, there are too few instances of use to measure loss accurately, a difficulty that disappears when related elements are summed.

However, inspection of the t-tests comparing the individual items, listed in Table 3 under *Verb forms—compound* and *Negation*, reveals an interesting contrast between the items in each group that show a significant decline and the ones that do not. Significant declines were observed

in the production of compound tenses formed with the auxiliary "avoir" and the accurate use of negation with such past tense forms. No significant declines were observed in the correct use of negation with present tense forms, or in the production of future progressive forms.

The decline of production of past tense forms is probably related to the fact that the past tense had been introduced only in the term preceding the first testing and, according to the teachers, had been incompletely acquired at that point. The items that show no significant decline, negation with present tense forms and future progressive, had been learned quite thoroughly at the same point in time. Negation with present tense forms is introduced in the first year of French instruction, extended in the second year and generalized to all present tense forms during the third year. The future progressive is introduced during the third year of instruction. Negation with compound past tenses requires students to modify the rule governing negation placement, so that this type of negation, like compound past tense, should also be considered as recently and incompletely acquired.

The large number of subjects producing negation with present tense verb forms (73) as opposed to the small number who produced correctly negated past tense forms (12) seems to support this interpretation. In addition, the comparable subordinating structures, modal + infinitive and full verb + infinitive follow the same pattern. The structure acquired earlier: modal + infinitive, does not exhibit significant loss. This allows us to modify the explanation offered previously for the decline in quantity of clause production as follows: while grammatical structures in general are more likely to be affected by language loss than vocabulary, it seems to be the most recently acquired structures that are most vulnerable to language loss.

If this is true, it seems reasonable to conclude that the loss in grammatical accuracy is due to the fact that the subjects are beginning L2 learners, and, thus, most of the structures they are using are, in fact, recently and incompletely acquired. The transcripts show clear evidence that this is the case. For example, in response to the task "Ask a friend why the didn't call you back", one subject said:

"Bonjour . . . bonjour Steve . . . pourquoi est-ce que tu ne . . . tu ne pas me téléphoner . . . demain soir . . . hier soir? J'attends . . . pour dix heures . . . et tu ne tu ne me téléphoner pas."

In the first sentence the subject manages to recall the vocabulary items *téléphoner* and *ne pas*, but does not manage to use either one accurately.<sup>2</sup> In the second sentence he does use negation accurately, but still does not use the correct verb form, although the same quotation shows that he can form the first person singular present.

The same subject in a subsequent task produced the following sentence:

"Je ne . . . j's ne peux pas aller . . . dans le soir avec . . . mon . . . mes amis."

This time he uses negation correctly on the first try, but then recalls first mon, and then makes it agree with the plural noun *amis*. These examples show that formation of the present, negation placement, and rules of adjective agreement are still being applied consciously, and apparently after vocabulary items to which they apply have been recalled.

If the overall loss in grammatical accuracy is due to the fact that most grammatical structures are incompletely and recently learned, this may help to account for the contrast between the results of this study and observation of native speakers experiencing language loss. On the basis of informal observation, Andersen (1982), for instance, hypothesizes that most of the difficulties such speakers have in communicating in their first language are due to loss of vocabulary, not of grammatical structures. Given the results of this study, one might speculate that this is the case because speakers experiencing L1 loss, unlike the subjects of this study, have complete and unconscious mastery of the grammar of their language. They do not need to apply grammatical rules. They do have difficulty, however, recalling vocabulary items because of interference from the surrounding other language and because of a lack of L1 output.

It seems likely then, that the pattern of language loss is going to be related to the relative mastery of the language one is losing. That is, beginning L2 students will experience loss of effective use of grammar, but people experiencing L1 loss are more likely to show a loss of effective use of the lexicon of their native language. This, of course, is a hypothesis that needs to be tested by a formal study involving L1 speakers.

## SUMMARY

The results of this study verified the main hypothesis that oral proficiency declines over a short period of time, and isolated a decreased

ability to use grammatical structures as the major skill involved in this decline. The results also indicate that fluency and vocabulary production do not show a significant decline over a short period of time. They, therefore, do not contribute significantly to the observed decline in overall oral proficiency. No single grammatical element or group of grammatical elements was isolated as being related to the observed decline, but the statistical analysis of some individual grammatical elements showed that most recently learned structures are more likely to be affected by loss than others, suggesting that a thoroughly learned structure is relatively immune to language loss.

This seems to be corroborated by observation of individuals experiencing L1 loss. In their case, it seems to be the lexicon, rather than the grammar of L1, that is affected by loss. Presumably, native speakers experiencing language loss have complete mastery of the grammar of their native language, and are, thus, less apt to show language loss in this area than beginning students of a second language.

## NOTES

<sup>1</sup>Negation, Verb forms—compound, and Adverbs do not appear in Table 2 because too few items are combined under these headings to make the result of t-tests comparing PRE and POST performance summed scores reliable. The results of the t-tests comparing the items listed under these headings will be discussed separately from the t-tests comparing the summed scores in Table 2.

<sup>2</sup>The transcription of the verb ending in *téléphon*-er was chosen because it is the basic form of the three homophonous inflectional endings, -er, -ez, -e, available to subjects at time of testing. The imperfect ending, -ais, which might be regarded as homophonous, especially by beginning L2 learners, had not been taught to subjects and there is no evidence in the production of the speaker quoted that he had acquired the tense elsewhere.

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