

FLUENCY AND USE OF SEGMENTAL DIALECT FEATURES IN THE ACQUISITION OF A SECOND LANGUAGE (FRENCH) BY ENGLISH SPEAKERS

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ABSTRACT

This study investigates the use of two parameters, fluency and use of segmental dialect features (accent) to rate the overall ability of speakers of French as a second language. A group of ten native English Canadians read a short text of 139 words in French (their second language). Their degree of fluency was established by a combination of the following measures: speech rate (words/min, syll/min, syll/s), number and duration of pauses, and hesitations. We also investigated their use of various segmental dialect features such as diphthongization of long vowels, affrication of /t d/, and high vowel deletion. These results were then compared to those of a group of ten native French speakers of the same region (Montreal).

1. INTRODUCTION

The overall ability of speakers of a second language can be rated according to different parameters, from proper use of syntax to good phonemic targets. In this study, we investigate the correlation between two parameters, fluency and use of segmental dialect features (accent) to rate the overall ability of speakers of French as a second language (FSL). Although different studies investigated the ability of speakers of a second language in terms of fluency (see Raupach, 1980 [6] and Grosjean, 1980 [2]) or in terms of a good pronunciation, little is known on the correlation between their fluency and their use of segmental dialect features. This study also raises questions concerning the process of acquisition of such features.

2. METHODOLOGY

The first group of subjects was selected from a sociolinguistic study conducted by Gillian Sankoff, University of Pennsylvania and Pierrette Thibault, Université de Montréal [2, 5]. A group of ten native English Canadians from Montreal read a short text of 139 words (Appendix 1) in French (their second language). The subjects were fluent enough in French to be able to carry on a conversation in that language for about one hour. However, their individual ability in French vary greatly. They were asked to read the text at the end of the interview. A second group of speakers, in the same age group, also from Montreal, but for whom French is a first language, were

asked to read the same text. This second group of subjects was recorded in a soundproof room and their only task was to read the short text. The text was designed to test the application of a variety of segmental dialect features (phonemic and phonetic).

3. ANALYSIS

To evaluate the overall fluency of our two groups of speakers, we used a set of various measurements derived from those proposed by Grosjean and Deschamps, 1975 [4]. These are: speaking rate (syll/min), articulation rate (syll/s), number and duration of pauses, type of pauses (filled and unfilled), errors and hesitations (or false starts).

Although, our study focuses on a large set of dialect features, this paper reports on only three of them: diphthongization of intrinsically long vowels (oral and nasal), affrication of /t d/ and high vowel deletions (/i y u/). These features were extracted from the 14 proper names found in the text (see appendix 1).

The same analyses were run on both sets of speakers.

4. RESULTS

4.1 Temporal variables

French speakers are on average faster than the English ones. However, some English (FSL) speakers are faster than some French (NFS) speakers. In terms of fluency, although there are fast and slow speakers in each set, the range of variation is a lot wider in the FSL group than in the NFS group. Also, the slowest speakers are found in the FSL group and the fastest in the NFS speakers. Average percentage of phonation time is 81.3% for the NFS speakers and 71.5% for FSL speakers (Fig. 1). The range goes from 52.1% (AM4) to 85.8% (FF7). Average speaking rate is 270.3 syll/min for the NFS group compared to 211.8 syll/min for the FSL group (Fig. 2). The range is not very wide in the NFS group (246.7 to 290.9 syll/min) with four out of ten speakers showing almost a similar rate. In the FSL group, however, the range is quite marked (139.8 to 261.8 syll/min) with three speakers who are particularly slow (AM4, AM2, AM1).

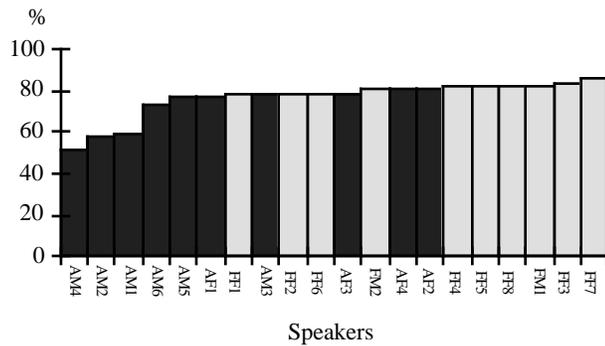


Figure 1: Phonation time (%),
 ○ French Speakers ● English Speakers

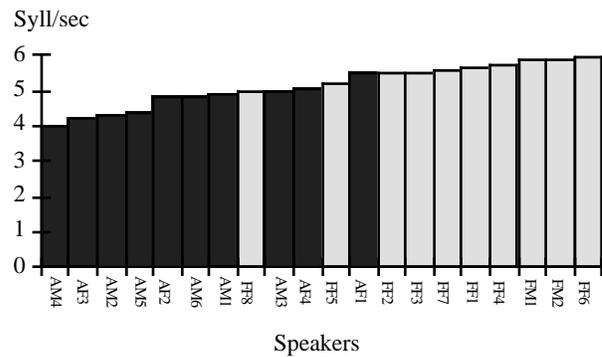


Figure 3: Articulation rate (syll/sec),
 ○ French Speakers ● English Speakers

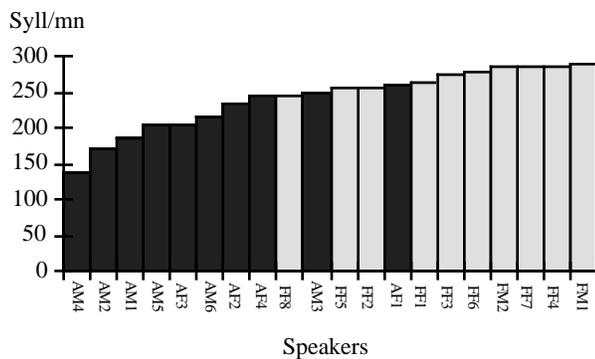


Figure 2: Speech rate (syll/mn),
 ○ French Speakers ● English Speakers

This same tendency of FSL speakers to be slower than the NFS speakers is also verified in the articulation rate (Fig.3). However, there is less of a difference between the two groups which could indicate that the English speakers, although they articulate more slowly than the French ones, also make greater use of the silent (unfilled) pauses. This is particularly visible for one speaker (AM1) who was one of the slowest speakers in terms of speaking rate but is a very average one in terms of articulation rate. The average articulation rate is 5.6 syll/s for the NFS group as opposed to 4.7 syll/s for the FSL ones.

In Figure 4, speakers are ranked according to their use of speech segments (portion of speech between two pauses). NFS (French) speakers are indicated in bold. This analysis shows that English and French speakers cannot be easily distinguished on their use of speech segments and silent pauses. However, filled pauses are almost only used by the English speakers (80% of English speakers as opposed to only 10% of the French speakers. Errors and hesitations (false starts) are also mainly found in the English group.

Speaker	Speech segment	Unfilled	Filled	Errors	Hesit.
FF3	2 1	1 9	1	1	0
AF1	22	19	0	0	3
FM2	2 3	2 2	0	0	0
FF4	2 5	2 5	0	0	1
AF4	25	22	2	0	0
FF5	2 6	2 5	0	0	0
FF7	2 7	2 6	0	0	0
FF8	2 8	2 7	0	0	1
AM3	29	22	5	1	3
AF3	29	25	2	0	3
FM1	3 0	2 8	0	1	0
AF2	30	27	2	0	1
FF1	3 3	3 2	0	0	1
AM6	34	31	1	0	1
FF6	3 5	3 4	0	0	0
AM5	38	33	3	1	1
FF2	3 9	3 8	0	0	0
AM4	42	43	11	0	1
AM1	46	41	0	1	4
AM2	53	40	10	4	6

Figure 4: Speech segments, pauses (filled and unfilled), errors and hesitations.

4.2 Segmental dialect features

NFS speakers make a more important use of the various dialect features. Diphthongization (Diph.) of intrinsically long vowels although very frequent in Canadian French can somehow vary according to different parameters including the situation (formal versus informal). Results (Fig 4) show that although NFS speakers tend to diphthongize more than FSL speakers (Average of 2.9 and 2.4 occurrences). However the differences between the two groups are not as important as those found for the two other parameters. Affrication of /t d/ when followed by highfront vowels (/i y/) inside word boundaries is an obligatory rule in Canadian French and is applied by all NFS speakers quite evenly. The application of the rule (Aff.) is less systematic in the FSL group. However, the real point of distinction lies in the number of high vowel deletions. High vowel deletion (Del.) is very frequent in the NFS group (Average: 4.1 occurrences) and almost inexistant for the FSL (Average: 0.7 occurrences).

Speaker	DIPH.	AFF.	DEL.	Syll/mn
FF8	4	3	3	246,7
FF5	5	3	2	256,4
FF2	5	3	5	256,9
FF1	3	3	4	264,8
FF3	1	3	5	276,9
FF6	4	3	5	280,4
FM2	1	3	5	284,8
FF7	3	3	4	286,2
FF4	2	3	5	286,3
FM1	1	3	3	290,9
Average	2,9	3	4,1	273,03
AM4	0	2	1	139,8
AM2	3	1	0	172,6
AM1	1	2	0	187,1
AM5	1	1	0	204,2
AF3	5	3	1	205,6
AM6	5	3	2	216,9
AF2	0	3	1	236,0
AF4	2	1	0	245,5
AM3	5	3	1	248,8
AF1	2	3	1	261,8
Average	2,4	2,2	0,7	211,83

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Figure 6: Segmental characteristics and speech rate.

5 DISCUSSION

In terms of fluency, the fact that French speakers are on average faster than the English speakers is not surprising. Although, this can be linked in part to the different methods of collecting the data, it can also be linked to factors inherent to speaking a second language. Furthermore, there

are strong differences between the two groups. For example, even though both groups make use of pauses in similar proportions, the unfilled pauses, errors and hesitations are found only in the FSL group. Also, although the FSL speakers articulate more slowly on average than the NFS speakers, some of them are as fast as the NFS ones. In fact, some FSL speakers sound as fluent as some NFS speakers. This is the case of the FSL speaker AF1.

The FSL group differ greatly from the NFS group in its use of segmental dialect features. The lower rate of affrication in FSL (English) speakers is due in part to the consonant /d/. Only 50 % of the FSL speakers affricated that consonant. This consonant occurs only once in all the proper names and is found in a word (Sainte-Cunégonde) that was not familiar to most speakers (NFS and FSL). This raised a question concerning the acquisition of segmental dialect features. If the allophonic variation of /t d/ is seen as a rule which applies on line when the context is favorable, shouldn't it apply even in the context of non-familiar words? However, if the allophonic variation is learned as an intrinsic component of the word itself, could't this explain why the FSL speakers could not affricate the consonant /d/ in a word they did not know? Our lack of data, unfortunately cannot allow us to do more than raise the questions.

We found that it is not possible to establish a correlation between accent (use of dialect segmental features) and fluency (Fig.4). This is true for the French speakers (see, for example, FF5 and FF4) as well as for the English ones. (see AF3 and AM3). This is not surprising for the first two features (diphthongization and affrication) but different studies (Trépanier and Archambault, 1992 [8], Tennant, 1993 [7], among others) reported a relationship between segment deletions and speaking rate. This is not the case in this study. Speaking rate is only one of the many factors involved in high vowel deletion, the other ones being segmental context and phrase accent. Still, it is quite surprising to discover that the rate of high vowel deletion in the English group is low even for those who otherwise show a combination of average speaking rate and good use of the other dialect features (e.g., AM3, AF1). This tends to reinforce our hypothesis (Archambault, 1985 [1]) that surface reductions are linked to a rhythmic reorganisation of the utterance. If these rhythmic patterns are not learned by the FSL speakers, the surface reductions such as high vowel deletion cannot happen.

However, we need more data to verify this hypothesis. The full text is now being analyzed and we are increasing the number of subjects. We will then compare for our two groups of subjects (English and French) the rhythmic patterns of utterances presenting context of high vowel deletion.

6. APPENDIX

Les noms de lieux au Québec

par
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Suzanne Thibodeau habite sur la rue Drolet, à Saint-Ferdinand. Sa soeur, Fernande, reste sur la rue Panet, à Saint-Hubert. Comme elle est enceinte, toute sa petite famille lui a fait, le mois passé, une petite fête chez sa mère, à...Sainte-Cunégonde. Dans la province, c'était la coutume, autrefois, de donner aux endroits des noms de saints et de saintes. Ce n'est pas tout-à-fait la même situation aujourd'hui. L'évolution s'est faite des noms de saints aux patronymes. Par exemple, leur petite cousine, Margaret, habite à Montréal, sur la rue Peel au coin de Dorchester. D'ailleurs, Dorchester est devenu en 1987 le boulevard René-Lévesque. Dans cet autre type de dénomination, on donne toujours le prénom et le nom de famille et non pas seulement le nom de famille, comme autrefois.

7 REFERENCES

1. Archambault, D. (1985). Production et perception de réductions de surface en français québécois, Ph.D. Dissertation, Département de linguistique et de philologie, Université de Montréal
2. Blondeau, H., L. Gagnon, M. Fonollosa, N. Lefebvre, D. Poirier & P. Thibault (1995) Aspects of L2 competence in a bilingual setting, October 24th, NWAVE
3. Grosjean, F. (1980). Temporal variables within and between languages. in H. Dechert and M. Rauchpach, ed., *Towards a Cross-Linguistic Assessment of Speech Production*. Frankfurt, P. Lang, 39-53.
4. Grosjean, F. & A. Deschamps (1975). Analyse contrastive des variables temporelles de l'anglais et du français: vitesse de parole et variables composantes, phénomènes d'hésitation, *Phonetica*. 31, 144-184.
5. Nagy, N., C. Moisset & G. Sankoff (1995). On the acquisition of variable phonology in L2, October 24th, NWAVE
6. Raupach, M. (1980b). Temporal variables in first and second language speech production, in *Temporal Variables in Speech. Studies in Honour of Frieda Goldman-Eisler*, H.W. Dechert and M. Raupach (red.) The Hague: Mouton, 263-270.
7. Tennant, J. (1993). Le débit de la parole peut-il avoir un effet sur la variation morphologique? in B. Ferguson, H. Gezundhajt and P. Martin, ed., *Accent, intonation et modèles phonologiques*. Toronto, Editions Mélodie, 35-54.
8. Trépanier, C. & D. Archambault (1992). *Chute de segments et traces de durée*. 19èmes J.E.P., Bruxelles, May 19 to 22 1992, 59-64.