TYPOLOGICAL VARIATIONS IN THE REALIZATION OF THE FRENCH ACCENTUAL PHRASE

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ABSTRACT

In this paper, we examine certain aspects of the French Accentual Phrase (AP) produced by monolingual Parisian and L2 speakers of French and discuss the implications language contact may have on our knowledge about the French prosodic system. We study the same text read by four monolingual Parisian speakers and two groups of different L2 speakers: four Central Africans and four Swiss Germans. The data are semi-automatically processed, and three prosodic features are analyzed: metrical weight of the realized APs, respect of AP-restructuring rules and distribution of sandhi phenomena. Our findings suggest that the prosodic systems of L2 speakers of French are closer to word prosodic systems than the system of Parisian French speakers: the former produce shorter APs than the latter, tend to allow accentual clashes and to avoid sandhi phenomena beyond their APs boundaries.

Keywords: accentual phrase, language contact, prosody, prominence, sandhi phenomena.

1. INTRODUCTION

The aim of this paper is to examine examine how language contact data can contribute to our knowledge of the French prosodic system. Our hypothesis is that contact varieties provide a "testing laboratory" for strong and weak parts of a linguistic system (*cf.* similar studies of other contact varieties, such as [6], [13] and [22]). We compare the realizations of the Accentual Phrase by three groups of speakers: (i) Parisian speakers that represent Standard Parisian French, (henceforth PF), (ii) speakers living in Neuchâtel whose L1 is Swiss German, a word stress language (Swiss German French, henceforth SGF), and (iii) Central Africans speakers whose L1 is Sango, a tone language (Central African French, henceforth CAF), see §2 below for further details.

One of the main characteristics of the French prosodic system is its lack of word prosody; in contrast with word stress and tone languages, lexical words are not prosodically marked in French [10][14]. In fact, Parisian French is usually described as being more a "boundary language" than a "stress language" [20][24].

The smallest prosodically marked unit in French is called **Accentual Phrase** (henceforth AP) [15]. In spite of the different approaches to this minimal unit, there is a certain consensus about its nature [7] [8] [17] [18] [19] [21] [24]. In this paper, we will assume that the AP basically consists of one content word and its dependent function words (see the notion of "clitic group", proposed by [10]). However, according to [15], the AP usually contains more than one lexical word (1.2 lexical words, namely 3.5/3.9 syllables in average). To explain this fact, two kinds of AP-restructuring constraints are generally invoked in the literature (see [16] and [17] for the description of other constraints).

The first is syntactic by nature and has been formulated as the **Align-XP constraint** in [21]. Briefly explained, Align-XP stipulates that if a lexical head dominates two adjacent content words, the first one loses its primary stress. For instance, the adjective *sympathique* in the clause *le sympathique maire* is a content word and could therefore receive a primary stress on its last syllable. However, since it is syntactically dominated by the same node as the noun it modifies, it is not stressed.

The second constraint is relative to rhythmical organization and is referred to as the **Clash Resolution constraint.** It stipulates that two adjacent syllables belonging to two different content words cannot be stressed. For example, in *une journée chaude,* the last syllable of the first noun *journée* is not stressed in order to avoid an accentual clash (see [10] or [16] among others).

Moreover, the AP is considered to be the domain for obligatory **sandhi** phenomena; liaisons

(as *les enfants* pronounced *les_z_enfants*) and re-syllabifications (as *il a mangé* pronounced *i-la-man-gé*) occur obligatory within APs [18][21]. In addition, French also have optional sandhi phenomena that are found beyond AP boundaries [19].

Our hypothesis is that speakers whose first languages have word prosody will segment the speech flow in smaller units than L1 speakers of French (*e.g.* mark every lexical word with a primary stress, respect rhythmic constraints less and not realize sandhis across content word boundaries). This hypothesis has already been tested on spontaneous Central African Speech [3], but, to our knowledge, no systematic comparison between similar data of Standard French and various contact varieties has yet been undertaken. In order to test the hypothesis, we focus on three features of the realization of the AP: (i) the metrical weight of APs, (ii) the relevance of restructuration constraints (Align-XP and Clash Resolutions); (iii) the distribution of sandhi phenomena inside and beyond the AP boundaries.

2. MATERIAL AND DATA

2.1. Corpus

The corpus consists of readings of the journalistic text of the Phonologie du Français Contemporain (PFC) project [9]. The speakers were selected according to the variables sex (two female and two male speakers for each variety) and age (two age groups for each variety: 25-40 years and 40-55 years). The PF speakers represent Standard French; they are monolingual and grew up in Paris. Both the CAF and the SGF speakers acquired French through formal education as a L2, and both use French daily in their professional life at the moment of the recordings. The only difference between these two groups is that SGF speakers moved from German-speaking Switzerland when they were about 20 years old, while CAF speakers grew up in a context where French was omnipresent.

In all, the corpus is nearly 36 minutes long and contains 4841 graphic words. The data have been semi-automatically aligned with a Praat script, Easyalign [2][11], which provides a 3-layer segmentation structure: a phones string, a syllabic string, and a word string. The alignments were checked manually by two of the authors, and syllables associated with a disfluency (false start

and/or hesitation) were coded with a specific marker and not taken into account in the statistics presented here.

2.2. Annotations

We conducted three kinds of annotation in order to compare the realization of APs in the three varieties.

First, we identified the **clitic groups** in the text according to morpho-syntactic criteria. Each content word and its dependant function words were considered as a clitic group. As an illustration, the sentence: *le premier ministre ira-t-il à Beaulieu* was segmented in four clitic groups: *(le premier) (ministre) (ira-t-il) (à Beaulieu)*. The distinction between clitic and non clitic words was made according to [12].

We then annotated **prominent syllables**, defined here as syllables that stand out from their environment by virtue of the perception of different prosodic cues [23]. Three experts of prosody (the three authors) listened to small parts of the recordings at most three times, and identified prominent syllables on the basis of their perceptual judgments (the methodology is inspired by [1]). Syllables that were perceived as prominent by two or all the annotators were considered as prominent in the final tier.

In the final step of the procedure, we identified the actual realized APs for each speaker. Each final syllable of a clitic group that was coded as prominent was considered as the right boundary of an AP.

3. ANALYSIS

In order to determine whether SGF and CAF speakers produced different APs from the PF speakers, we paid special attention to three features of AP realization: the ratio of prominent syllables/ the number of pronounced syllables per AP (§3.1), the AP-restructuring constraints (Align-XP and Accentual Clash Resolution (§3.2)) and sandhi phenomena (§3.3).

A paired student t-test [5] was used to assess whether there were significant differences between the three groups of speakers. The advantage of this test is that it manages statistical significance on a small set of observations.

3.1. Distribution of prominent syllables

If the L2 speakers segment the speech flow in smaller units than the Parisian speakers, we would

expect to find more prominent syllables by the former group than in the latter. This is confirmed by our data; a statistic test shows that the ratio of prominent syllables is significantly less important for PF speakers (30%) than for CAF and SGF speakers (41%) – ($t(6)=-3.45, p=0.01$). Moreover, there are more prominent syllables associated with the right boundary of a clitic group in the readings by the L2 speakers than by the PF speakers. Thus, the Parisian produce larger APs – (3.6 syllables/AP in average, which is similar with the observations of [15]) than other speakers (2.9 and 3 syllables/AP for CAF and SGF speakers, respectively) – ($t(6)=3.8, p=0.09$) as we hypothesized.

3.2. AP-restructuring constraints

3.2.1. Align-XP

In the text we have studied, the Align-XP constraint potentially concerns 18 sites. It is not respected in 45% of the cases by the PF speakers, 56% by the SGF and 71% by the CAF. There is a significant difference between PF and CAF ($t(17)=2.9, p=0.009$), but not between PF and SGF (($t(17)=1, p=0.3$)). These results are surprising; according to our hypothesis, we would except the PF speakers to respect the Align-XP more often than they actually do. In should, however, be noticed that there is important inter-speaker variation in the PF group; two of the speakers respect the constraint (in 12/18 and 14/18 of the cases), while the two others do not (they respect it for 5/18 and 8/18 of cases).

3.2.2. Accentual Clash

We extracted 11 contexts of potential accentual clashes from our data. As we hypothesized, there are significant difference between the PF speakers and the other groups of speakers as regards the realization of clashes ($t(10)=10, p<0.001$), but not between the CAF and the SGF speakers ($t(10)=0.8, p=0.43$). PF speakers tend to avoid clashes (they avoid clashes in 86% of the potential sites), while CAF and SGF speakers frequently produce clashes (respectively in 89% and 81% of the cases). For instance, all the PF speakers realize *Marc Blanc* as one AP whereas all the SGF and CAF speakers produce prominences on both *Marc* and *Blanc*.

3.3. Sandhi phenomena

The sandhis in the text were identified on the basis of perceptive and acoustic treatment by the authors of the paper. We considered that a liaison was realized if it was clearly audible and that re-syllabification did not occur if adjacent consonant and vowel were separated by a pause and/or a glottal stop. We distinguished internal sandhis that occur inside the realized APs (§3.3.1) from external sandhis that occur beyond the realized APs boundaries (§3.3.2).

3.3.1. Internal sandhi phenomena

There are 25 sites of potential internal sandhis in the text (13 sites of liaison, 12 of re-syllabification). A significant difference is observed between the PF and the other speakers ($t(24)=4.7, p<0.001$), but not between the CAF and the SGF speakers ($t(24)=1.7, p=0.1$). In fact, the PF produce 100% of the potential sandhis, whereas CAF speakers and SGF speakers produce 66% and 74%, respectively. For instance, liaisons that are realized by all the PF speakers, such as [ɡʀɑ̃.te.mwa] are realized by only one CAF speaker and one SGF speaker. Moreover, all the PF speakers re-syllabify across word boundaries in *même entamé* [mɛ.mɑ̃.ta.me], but the CAF and SGF speakers make a pause between these two lexical items [mɛm.ɑ̃.ta.me].

3.3.2. External sandhi phenomena

13 sites of potential external sandhi (4 sites of liaisons and 9 sites of re-syllabification) are extracted from the text. The CAF speakers almost never produce external sandhis (4%), the SGF produce some (38%) and the PF produce many (84%). Thus, there is a significant difference between the PF and the other speakers ($t(12)=10, p<0.001$), and a less pronounced difference between the CAF and the SGF speakers ($t(12)=3.5, p=0.004$).

3.4. Towards a typology of the AP realization

An overview of our data is presented in Figure 1 below, which was obtained by estimating a distance for each pair of speakers (cumulative sum of the differences) and using **Multi-Dimensional Scaling** [4]. The figure strengthens our initial hypothesis: SGF and CAF clearly differ from PF. The figure also shows that the intra-group

variations are small compared to the inter-group variations, especially for the PF speakers.

Figure 1: Representation of the speakers' characteristics in a 2-dimensional space.
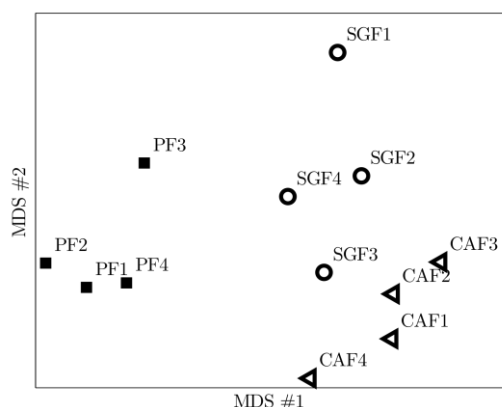
4. CONCLUSION

All the phenomena that we have studied support our initial hypothesis: the Parisian speakers segment the speech flow in units that correspond to the AP that is predicted by the models of French prosody. The CAF and the SGF speakers, in contrast, tend to segment the speech flow according to word boundaries; prominences are observed on most contents words, rhythmic constraints do not necessarily apply and fewer sandhi phenomena are observed. Consequently, our data strengthen the initial hypothesis; the segmentation of the speech flow in APs as the minimal prosodic constituent is a "weak point" of the French prosodic system and the syncretism between accentuation and intonation fails to be maintained in varieties where French is in contact with languages with word prosodic systems, in this case with a stress and a tone language. In order to confirm the tendencies we have found here, studies of L2 speech of other languages without word prosody should be undertaken. Future work should also include fine acoustic analyses of prominent syllables in order to determine if they are of a different nature (primary vs. secondary stress, etc.).

5. REFERENCES

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