Realization of the French initial accent: Stability and individual differences

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We examined the realization of the French accentual phrase (AP, [JF00,02]), in particular the early rise, the melodic marker of the initial accent of the AP. Among the roles attributed to the initial accent is marking the presence of a strong prosodic phrase [AS07] and cueing the presence of a content word in word segmentation and lexical access [WE06, SP10].

We used a subset of the Edinburgh Corpus, a phonetically-controlled corpus of read speech containing adjective scope ambiguities, such as [les gants]$_{NP}$ [et]$_{CONJ}$ [[les bas]$_{NP}$ [lisses]$_{AP}$]$_{NP}$ 'the smooth gloves and stockings' low and [[[les gants]$_{NP}$ [et]$_{CONJ}$ [les bas]$_{NP}$]$_{NP}$ [lisses]$_{AP}$]$_{NP}$ high attachment [AS07]. The corpus is annotated on several levels (e.g., syntactic boundaries, pauses, and segments), and the length of both nouns and adjectives is manipulated. We performed an autosegmental metrical (AM) prosodic annotation of 32 utterances from each of the six speakers of the corpus. Each utterance was produced with two or three APs, a unit that includes one or more content words and any preceding clitic function words. According to the literature, a two-rise $L_1H_1L_2H_2$ (early rise-late rise) pattern is often realized on APs that are long enough to accommodate four tones, while other patterns (e.g., L_1H_2, $L_1H_1H_2$) are realized on shorter APs.

Here we focus particularly on the first AP, where it is realized with one content word. We observed a consistent difference in shape between the early and late rises. Across speakers, while the late rise tended to be convex and almost always ended with a simple peak (93.1% of cases), the early rise tended to be concave and its peak was often realized with a high plateau or a "bump" (48.6% of cases) rather than a simple peak (see Fig. 1). While the shape differences of the L_1H_1 have been reported in the literature ([RL02, WE03]), and the general consensus is that these are realizations of the same event, the distribution of simple peaks *vs.* high plateaux and the factors conditioning these realizations are not yet understood.

Somewhat surprisingly given reports in the literature ([JF2000, WE06]), no speaker showed a clear progression to more two-rise realizations as the length of the AP (in syllables) increased (see Fig. 2). We hypothesized that more content word syllables in the AP would favor the realization of a H_1 plateau, since the speaker has more time to realize a longer event. This hypothesis was not confirmed: 50% of two-rise APs with 2 or 3 CW syllables and 44.4% with 4 CW syllables were produced with a H_1 plateau. (APs with only 1 CW syllable are never realized with a two-rise pattern.) Two speakers (S2, S5) showed a preference for $L_1H_{1(p)}L_2H_2$ when there are at least two content word syllables. Two (S1, S3) produced very few $L_1H_{1(p)}L_2H_2$ patterns, regardless of AP length, while for the other two, the pattern was mixed. In contexts where we had expected the two-peak pattern, we sometimes found a pattern we have tentatively coded $L_1H_1!H_2$, consisting of an early rise followed by a fairly shallow fall. We are conducting analyses to determine whether the last tone is indeed $!H_2$, a tone not included in the inventory of AM accounts of French ([JF00, JF02, DR15]). Several speakers use this pattern, and S1 makes regular use of it, repeated across the first two APs.

An influence of segmental composition on the melodic shape of the initial accent emerged from the data: for APs beginning with a voiceless fricative, all speakers realized the pattern $H_1L_2H_2$, i.e., an early peak without L_1 and so without the preceding rise (Fig. 1). Future research is needed to determine whether this tonally absent L_1 is in fact signaled by the "segmental intonation" of the fricative, for example, low center of gravity [NI12].

Our results show patterns common to all six speakers (e.g., simple H1 peaks and H1 plateaux for 33%-76% of two-rise patterns, segmentally conditioned $H_1L_2H_2$), as well as patterns differing across speakers ((dis)preference for $L_1H_1L_2H_2$, $H_1L_2!H_2$), in a very controlled task with the same set of materials. While much of the literature on peak *vs.* plateau realization concentrates on the influence of these types of realization on prominence perception and alignment (e.g., [BA12]), we examine other factors that may be in play, such as the length of the prosodic phrase, the presence of a morpheme or word boundary, and the strength of the left prosodic boundary.

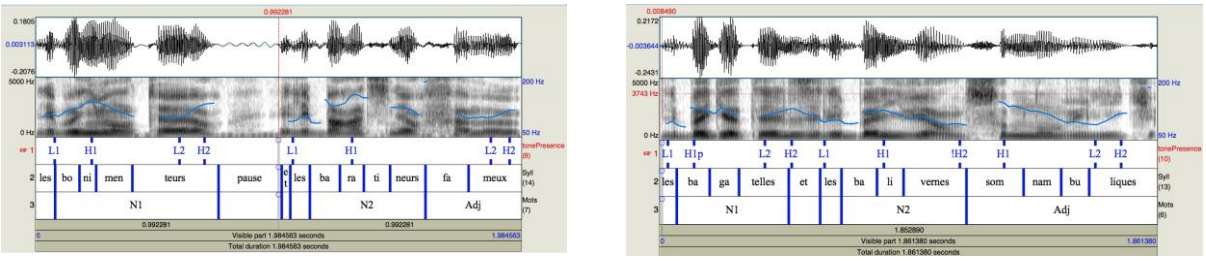

Figure 1. Left: $[L_1H_1L_2H_2]_{AP1}$ (peak realization of H_1) $[L_1H_1L_2H_2]_{AP2}$, Speaker 5, low attachment. Right: $[L_1H_{1p}L_2H_2]_{AP1}$ (plateau realization of H_1) $[L_1H_1!H_2]_{AP2}$ $[H_1L_2H_2]_{AP3}$, Speaker 5, high attachment.

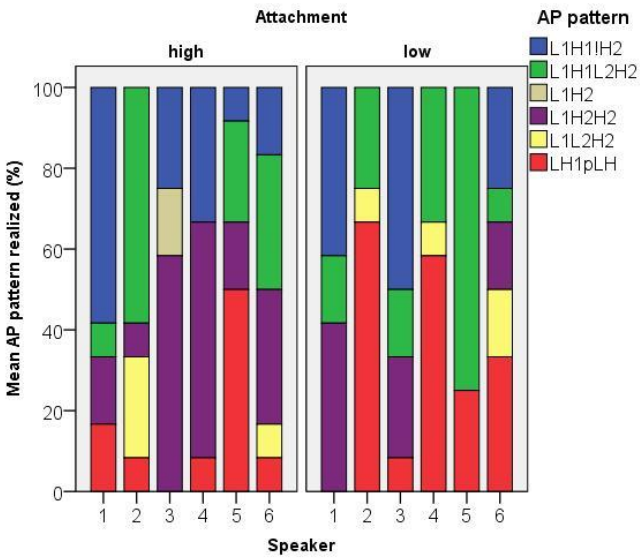

Figure 2. Distribution of AP1 pattern types (AP ≥ 2 content word syllables)

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