

Reset inclination and prosodic parallelism in expressive speech

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Abstract

This paper describes the prosodic phenomenon of reset inclination extending over a long stretch of expressive speech in French radio press reviews. The stretch of speech delimits a thematic sequence and covers different types of reported speech units, ranging from a single clause to several utterances. Within a number of those thematic sequences, an intonational parallelism occurs. At every repetition, a reset takes place at a higher level: this makes up an inclination of the fundamental frequency for the repeated segment throughout the thematic sequence. The argument is that reset inclination constitutes a marker that has three effects: from a syntactic point of view it co-occurs with an enumeration effect; considered as an iconic representation, it is a rise because of an upward slope movement; from a pragmatic point of view it signals the speaker's involvement and contextualises speech events. In some cases, reset inclination is also related to the superposition of voices in speech. This study aims at clarifying our understanding of the communicative function of organisational patterns in speech.

1. Introduction

Introduction is composed of two parts. Firstly, acoustic and formal features of reset inclination are described and compared to declination, its frequently studied opposite phenomenon. Secondly, the presentation of the material and research context brings into light elementary functional constituents of reset inclination. Theoretical approaches anchored in interactional dynamic seem appropriate to account for the three effects of reset inclination mentioned in the abstract above.

1.1. Declination, inclination and reset

Inclination, together with declination, is the global movement of the fundamental frequency slope. In the literature on intonation, they are commonly observed at the level of an utterance and can be steep or gradient [1]. As for declination, there is no consensus whether it is a purely physiological effect based on a decrease of the subglottal pressure or whether it is speaker-influenced, or both. Inclination, much less investigated, is assumed to depend on the speaker's intention since increasing of F_0 demands an articulatory effort. This paper proposes to examine the inclination in a semi-spontaneous expressive speech not only over the course of an utterance but over the course of several discourse units. In this case, the definition of inclination as a slope is not sufficient to describe the phenomenon since the slope is not to be considered as linear, but as a succession of gradient resets of F_0 on the "key" segments of discourse as schematized in

Figure 1. Thereby, reset inclination is a combination of an upward jump (reset) and an increasing movement over the stretch of speech. The phenomenon is accompanied by a repetition of similar prosodic patterns (*intonational parallelism* [2], [3]) of either an identical phrase or items having a similar morphological and phonetic content.

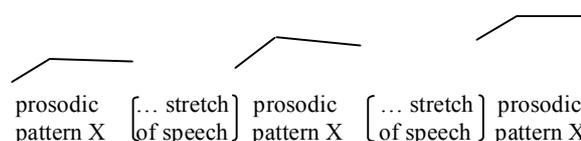


Figure 1: *Schematic representation of reset inclination.*

From the description above, it follows that reset inclination is a combination of local and global prosodic cues: the prosodic pattern is realised on a word or phrase and it has an effect on how a thematic sequence progresses at a global level.

Paeschke [4] proposes the term *global trend of F_0* including both declination and inclination. The idea of a global trend of F_0 seems to be more appropriate since both these phenomena can contain units of different size and form. In fact, analysis will highlight how declination can coexist with inclination, in cases where intonational parallelism has a declination form. Discourse analysis research observes the declination on larger units. For English, Wichmann [2] shows that the macrodeclination of *paratone* [5] is made of successive partial resets that are situated at a lower level at every occurrence and followed by a micro-declination. Compared to findings of Wichmann, reset inclination is a reverse phenomenon.

The definition of reset as a "high onset", as it was suggested by Grobet and Simon [6] for French, is more appropriate for the study of inclination because what is compared is the pitch height from one to another repeated item. In this way, the reset, or high onset, can be situated at any pitch level as long as it emerges from its surrounding prosodic units. From what was explained above and represented by Figure 1, it follows that reset inclination differs from a "simple" inclination in that the latter is increasing by successive intonation contours (schematised by: $_ \text{--}^-$) and does not progress by resets.

1.2. Material and research context

This research is situated at the prosody-discourse interface and explores how prosody contributes to the discourse organisation (see Simon 2004 [7]). Observed at discourse level, prosody has various functions: it can ensure continuity and cohesion as pointed out by a number of authors; or guide the interpretation by highlighting threads throughout the speech. Following Bolinger, Wichmann [2] associates the intonational parallelism to a *cohesive device in discourse* [3].

Our 60 minutes long corpus is made of French radio reviews. The specificity of radio press reviews is that one speaker (radio journalist) represents the discourse of several public

personalities, such as politicians, philosophers or journalists. The discourse is polyphonic as multiple voices emerge out of the speaker's discourse. The research question is how these voices are structured by means of prosody. Previous studies, mostly referring to Bakhtine [8], showed a number of prosodic cues participating in the structure of voices, like variation in register, in pitch, in pauses and in vowel quality (see for example Günthner [9] for German conversations or Bertrand [10] for French ones). Reset inclination is one of these cues, but its function is more complex than just signalling the other voices in a reported speech. The difference is that inclination concerns not only the voice (point of view) of the speaker (radio journalist) as inclination demands a voluntary effort, but also the voices of quoted persons. Therefore, the 'escalation effect' of inclination can be understood as successive manifestations of these voices, as if at every high onset there was another voice adding more emphasis to the discourse.

We distinguish three main discourse unit types in a radio press review: reported speech, introductory speech and commentary. The last two are reserved for the radio journalist, but often his commentary is voco-prosodic as he reacts to the content of the discourse he relates; he superimposes his point of view directly on utterances he is quoting (direct reported speech). The Geneva School discourse analysis model [11], [12] takes into consideration the embedding of multiple voices that are represented at different levels: monological/monologic, dialogical/dialogic, polyphonic, autophonic. Monological/dialogical refers to empirical producers, one or many; monologic/dialogic refers to text structure: whether its highest embedding structure is that of a move (in Roulet's sense [11]), or that of an exchange, including two or more moves as immediate constituents. Polyphonic refers to the representation of other discourses and autophonic of the speakers' discourses. The radio press review is characterised as monological, dialogic and polyphonic.

The interactional approach of speech explains stylistic variations in terms of relational processes. Two types of relation are at work in a radio press review: one relates the medium of communication [13] (fluctuation between oral and written media) and the other relates to the virtual interaction (with the audience and with quoted persons). These multiple relations influence prosodic choices of the speaker and reflect the discourse's dynamics in *active contextualisation*, as determined by Coupland [14]. The idea is that all linguistic signs are indexical and contexts are invoked by discourse participants through *contextualisation cues* (Gumperz [15]).

The reception of reset inclination by the audience, as well as its production, can be understood within Auchlin's concept of *experiential blending*. Auchlin [16], together with Simon [7], claims that prosodic (and vocal) variations (of intonation, rhythm or register) directly shape facets of speech experience, as well as inputs, frames and outputs of the interpretation process. From their point of view, discourse is an experiential sequence temporally driven by successive contacts and the elaboration of linguistic constructions, and should not be examined apart from its experiential, corporeal and (inter-)subjective dimensions. In a certain way, these hypotheses meet those of iconicity of language developed by Fónagy [17] and

Ohala [18]. Iconicity functions if there is an experience of natural or human sound and/or rhythm that is mobilised by linguistic signs, and moreover by their voco-prosodic content. Iconically, inclination is associated with expansion, growing up; and high pitch onset is associated with a jump or inner agitation (positive, as well as negative).

2. Method

French radio reviews were transcribed within Praat software [19], and aligned with EasyAlign [20]. Using the F_0 estimation of Praat, the Prosogram script [21] stylises the F_0 curve that is measured in semi-tones (ST, relative to 1 Hz). Reset inclination is perceived as salient and thus easily observed through prosodic phenomena such as breaks, frequency range, frequency height or high pitch onset. The analysis was achieved in three steps. First, the occurrences of reset inclination were identified by audition and isolated. Second, the degree of inclination was measured in semi-tones as obtained in the graphical representation of prosogram [21]; the prosodic patterns used for inclination were described according to three prosodic parameters: fundamental frequency, intensity and duration. Third, the discourse units involved in the reset inclination phenomenon were examined.

3. Analysis

Corpus analysis allowed us to retrieve various manifestations of the inclination phenomenon that shows different slope degrees, sequence types, or distances between occurrences (consecutive or spaced over the speech span). We decided to present here the most marked examples in two categories: *enumeration* and *question-enumeration*. Studies on enumeration abound in the literature, for example: [22] for English, [23] for German, [24] for French. All studies confirm that different prosodic patterns can be used for the enumeration effect, though the most common is the prominence of the last (or/and of the first) syllable of each enumeration's item. It was observed that the first item of a list is hardly ever salient: the listener perceives only at the second item that there is an enumeration going on.

3.1. Enumeration

Even though the enumerated items do not have the same lexical content, the speaker can find a way to produce similar prosodic patterns by emphasising comparable points, such as accentuation of the same position of a syllable or use of the same dynamic contour.

Example (1) represented by prosogram in Figure 2 is a classical example of enumeration. Each item is delimited by a break and double accentuation: the initial accents are completed with final accents. The repeated prosodic pattern has its own declination. The inclination line indicates the progression in time of the level of pitch reset from one item to the next (except from the second to the third, which are at the same level).

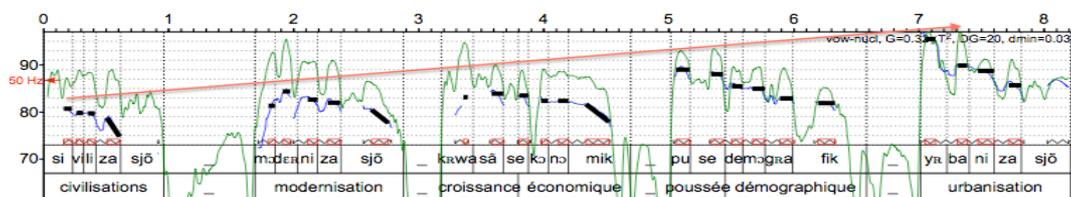


Figure 2: Prosogram of Example (1)

By the integration of enumeration and inclination, enumerated items – “modernisation”, “economic growth”, “demographic expansion”, “urbanisation” – are presented as growing problems for French politics.

As for Example (2), there is a special need to examine the intensity parameter and the vowel quality of [a] in the words “immigration”, “communautarisme” and “multiculturalisme”. The intensity and vowel quality variation are both crucial for perceiving inclination, as well as the effect of expansion that accompanies it. The intensity peak on stressed syllables (indicated by circles in the prosogram, Figure 3) is increasing from one item to the other: 72dB, 75dB and 77dB. This progression follows the F_0 .

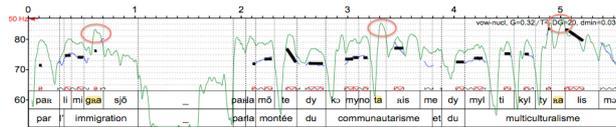


Figure 3: Prosogram of Example (2)

Figure 4 shows prosodic patterns that are difficult to see in the prosogram. The same vowel [a] on the penultimate syllable, or antepenultimate syllable for the last item, marks the interruption of F_0 as well as the climax of items.

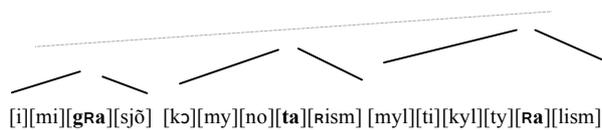


Figure 4: Reset inclination of repeated prosodic patterns of enumeration.

The absence of pitch in Praat detection for [a] and the big amount of energy invested (cf. Gussenhoven [25] *effort code*) are the signals that there is a change in vowel quality. The speaker takes a creaky voice to represent the threat of the three items for French identity. Like in the previous example, inclination expresses the negative stance of the speaker: the facts he reports upset him, and he reports also the upsets of his sources.

3.2. Question-enumeration

Question-enumeration is a combination of a repeated question and an answer in the form of argument that either are responses or the reason of being of the question. The orthographic transcription of Example (3) is provided with the aim to illustrate the co-text and analysis steps.

[...] // à qui la faute // si le débat sur la constitution de l'Europe / et l'adhésion de la Turquie // ne mobilise pas l'opinion // au peuple // ou à ceux qui le conduisent // à qui la faute // si nous ne savons plus faire la place entre l'essentiel / et l'accessoire // à qui la faute / si les priorités nationales qu'on nous jette à la figure // repartent en boomerang [...]

The theme is *à qui la faute?* (“Whose fault is it?”): the question is repeated three times and followed by *si* (“if”) explaining what the fault is about. Breaks are surrounding every occurrence of *à qui la faute?* as indicated by slashes (/ short break, // long break) in the orthographical transcription; the average duration of long breaks is 570ms. Figure 5 schematically represents the intonation curve of reset

inclination of the question in Example (3). Syllables of the thread theme – [a][ki][la][fot] – are separated in square brackets and are aligned with a representation of the F_0 curve. Time duration (in seconds) between occurrences of the question over the stretch of speech is indicated in brackets.

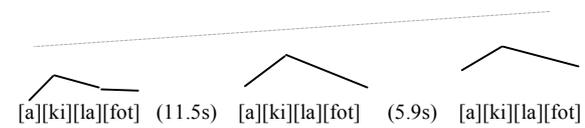


Figure 5: Reset inclination of repeated prosodic patterns of the thread question “A qui la faute?”

A similar prosodic pattern, with the peak on syllable [ki] (*qui* “who”) is produced three times. The radio journalist puts an emphatic accent on the [ki] syllable. Reset concerns the whole segment, but is most important on the first syllable [a]: +4.5ST for the second occurrence, and +4ST for the third one. The mean frequency is progressively increasing: 80.6ST, 87.3ST and 89.7ST. Frequency range values vary from 10.2ST for the first, 19.6 ST for the second, to 17.7ST for the third. All described prosodic features work together to represent an increasing movement.

The following example (4) – *Qui sommes-nous?* [ki][səm][nu] (“Who are we?”) – shows different features. The repeated prosodic pattern is made of a high onset on the first syllable [ki] and a steeply falling extended final accent on [nu], which gives a set of declinations that is hardly increasing (see Figure 6). The emphatic accent is again on [ki] (“who”), as in the previous example, indicating the focus of the question. Breaks are surrounding the threads of the speech.

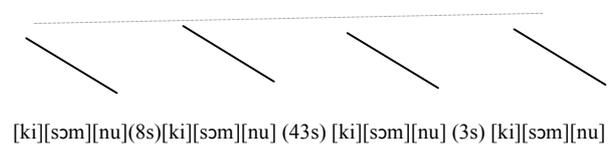


Figure 6: Repeated declination with a reset inclination of the thread question “Qui sommes-nous?”

Over the first three occurrences, the mean frequency is 88ST; it grows to 90.4ST on the fourth occurrence. Before the third occurrence of *Qui sommes-nous?*, there is a rather long discourse sequence of 43.4s. Afterwards, reset starts at the same level as for the first occurrence. For the fourth and last occurrence, the reset starts slightly higher than the third one (+1ST). The listener would probably not perceive the inclination in this example; he would base his perception on constant resets associated with agitation and a state of alert.

Examples (3) and (4) can receive the same pragmatic understanding within the discourse model of Geneva school. By using one voco-prosody for question and another one for arguing its foundation, the speaker uses prosody resources to represent dialogic alternation of two opposed points of view: the one of the “people” asking questions and the other one of the political domain to which the question is related to. One argument represents one topic of the political point of view; therefore, we have one point of view (of “people”) confronted to several political points of view. In this way, the speaker provides the listener with the experience of the speech event, that is, the political event he relates. The polyphonic dimension of the examples is ensured by the

sources given in the introductory speech: the listeners have the information that the author of the examined speech is not a radio journalist.

4. Concluding remarks

This study confirms previous findings about how the prosody collaborates with lexical, syntactic and discourse content of the speech. Prosody contributes to discourse organisation by providing it with dimensions such as amplitude, movement, and energy.

Reset inclination needs the form of repetition to become meaningful, and repetition takes place at different levels: prosodic, lexical and syntactical. Inclination is a phenomenon that can be a constituent of any prosodic form: syllable duration, vocal effort, pauses, even declination as long as there is a gradual reset of pitch (and/or intensity) growing progressively in time independently of the size of speech span.

We suppose that reset inclination can be observed in everyday speech whenever the speaker wants to express iconically his disagreement and his growing agitation about the discourse topic. Nevertheless, the speaker could use a reset inclination to express his positive reactions as well.

5. References

- [1] t'Hart, J., Collier, R., Cohen, A. 1990. *A Perceptual Study Of Intonation: An Experimental-phonetic Approach To Speech Melody*. Cambridge: Cambridge University Press.
- [2] Wichmann, A. 2000. *Intonation in Text and Discourse. Beginnings, Middles and Ends*. Harlowe: Logman.
- [3] Bolinger, D. 1989. *Intonation and its Uses*. London: Edward Arnold.
- [4] Paeschke, A. 2004. Global Trend of Fundamental Frequency in Emotional Speech. In: *Proceedings of Speech Prosody 2004*, Bel B., Marlien I. (eds.), Nara, Japan.
- [5] Yule, G. 1980. Speakers' topics and major paratones, *Lingua* 52. 33-47. North Holland.
- [6] Grobet, A., Simon A.C. 2001. Différents critères de définition des unités prosodiques maximales, *CLF* 23. 143-163.
- [7] Simon, A. C. 2004. *La structuration prosodique du discours en français. Une approche multidimensionnelle et expérimentelle*. Bern: Lang.
- [8] Volochinov, N.V. (Bakhtine, M.). 1929. *Le marxisme et la philosophie du langage, Essai d'application de la méthode sociologique en linguistique*. (traduction française en 1977 par M. Yaguello). Paris: Éditions de Minuit (coll. Le Sens Commun).
- [9] Günthner, S. 1999. Polyphony and the 'layering of voices' in reported dialogues: An analysis of the use of prosodic devices in everyday reported speech. *Journal of Pragmatics* 31. 685-708.
- [10] Bertrand, R. 2001. Être soi avec les mots d'autrui. *Faits de langues*, 23.
- [11] Roulet, E., Filliettaz, L., Grobet A. 2001. *Un modèle et un instrument d'analyse de l'organisation du discours*. Bern: Peter Lang.
- [12] Auchlin, A., Grobet, A. 2006. Polyphonie et prosodie. In Perrin L. (ed.), *Recherches Linguistiques n°28 : Le sens et ses voix. Dialogisme et polyphonie en langue et en discours*. Metz : Centre d'Étude Linguistiques des Textes et Discours. 77-104.
- [13] Burger, M. 2001. La dimension interactionnelle. In Roulet, E., Filliettaz, L., Grobet, A. *Un modèle et un instrument de l'organisation du discours*, 139-163. Bern: Lang.
- [14] Coupland, N. 2007. *Style. Language Variation and Identity*. Cambridge: Cambridge University Press.
- [15] Gumperz, J. J. 1992. Contextualization and understanding. In Duranti, A., Goodwin, C. (eds.), *Rethinking context: Language as an interactive phenomenon*, 229-252. Cambridge: Cambridge University Press.
- [16] Auchlin, A. 2003. Compétence discursive et co-occurrence d'affects: 'blends expérientiels' ou (con)fusion d'émotions? In Colletta, J. M., Tcherkassof, A. (eds.), *Les émotions. Cognition, langage et développement*, 137-152. Hayen: Mardaga.
- [17] Fónagy, I., 1983. *La vive voix. Essais de psychophonétique*, Paris: Payot.
- [18] Ohala, J. J., 1984. An ethological perspective on common cross - language utilization of F₀ of voice. *Phonetica* 41:1-16.
- [19] Boersma, P., Weeninck, D., 2009. *Praat: doing phonetics by computer* (Version 5.1.20) [Computer program]. Online: <http://www.praat.org/>, accessed on October 31, 2009.
- [20] Goldman, J.P., 2008. "EasyAlign: a semi-automatic phonetic alignment tool under Praat", [Computer script]. Online: <http://latlcul.unige.ch/phonetique/easyalign/>, accessed on October 1, 2008.
- [21] Mertens, P. 2004. The Prosogram: Semi-Automatic Transcription of Prosody based on a Tonal Perception Model. In Bel B., Marlien I. (eds.), *Proceedings of Speech Prosody 2004*, Nara, Japan. Online: <http://bach.arts.kuleuven.be/pmertens/prosogram/>
- [22] Tannen, D. 2007. *Talking Voices. Repetition, Dialogue, and Imagery in Conversation Discourse*. Cambridge: Cambridge University Press.
- [23] Auer, P., Couper-Kuhlen E., Müller, F. 1999. *Language in Time. The Rhythm and Tempo of Spoken Interaction*. Oxford: Oxford University Press.
- [24] Auchlin, A., Simon, A.C. 2004. Gabarits prosodiques, empathie(s) et attitudes, *CILL* 30(1-3). 181-206.
- [25] Gussenhoven, C. 2002. Intonation and interpretation: Phonetics and Phonology. *Speech Prosody 2002: Proceedings of the First International Conference on Speech Prosody*. Aix-en-Provence, ProSig and Université de Provence Laboratoire Parole et Langage. 47-57.