Intonational grouping, boundaries, and syntactic structure in French

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ABSTRACT

This paper describes the units and rules involved in (1) the lexicon-prosody interface, (2) the intonation grammar, (3) prosodic grouping, and (4) the syntax-prosody interface. All units are depicted in a multi-layered representation of prosodic structure.

INTRODUCTION

Given an arbitrary sentence several intonation patterns can be generated that are equally well-formed with respect to the grammar of intonation, although in a particular contextual setting some may be more appropriate than others. The acceptability of an intonation pattern depends on several factors: (1) the syntax of intonation units, (2) the alignment of these units with the segmental level, (3) the interaction between prosodic structure and syntactic structure, (4) the semantics of intonation units.

This paper will be restricted to the second and third aspects. The intonation model used and the semantics of basic intonation units have been described in Mertens [1987, 1990, 1992, 1993]. Although this paper will be about French, it states which parameters (in the sense of Hirst [1991:306]) of the model are language-specific and which are not.

At the level of prosodic form, the intonation group (IG, for short) is just a sequence of one or more tones that complies with the internal syntax of the unit. Our analysis for French is shown below. The tone paradigms (NA, AI, AF), their composition, and the internal structure are language-specific. The brackets indicate optional parts.

IG
$$\rightarrow$$
 ((NA) AI) (NA) AF (NA)

The structure of the IG was defined on the basis of the data in a corpus, in such a way that each utterance could be analysed as a sequence of IGs. But the definition of the IG does not explain how sequences of IGs can be generated for arbitrary sentences, i.e. how the unit should be mapped onto the segmental chain. It will be shown that, in order to do so, an intermediate layer is needed between the syllable and the IG, as well as a rule on the grouping of syllables. Moreover an additional layer on top of that of the IGs is needed to represent the prosodic grouping of IGs; there will also be rules stating the grouping mechanism and the constraints from (linear) syntactic structure.

GENERAL OVERVIEW OF DESCRIPTIVE UNITS AND RULES

The segmental and suprasegmental chains appear to be interwoven in a rather complex way. The suprasegmental structure results from the use of tones which in turn are constrained by both morphemic and syntactic properties of the segmental chain. These relationships call for a *multi-layered representation* of prosodic structure in which each layer introduces a new descriptive unit of a higher level, resulting from the grouping of units of the preceding level. The following table gives an overview of the factors at play for each of these layers, and indicates the corresponding prosodic units.

sub-units grouped	resulting unit	stress type	factors	rule nature
-	syllable/word	potential (word stress)	morphemic/ lexical	deterministic
syllables/words	stress group	potential	syntactic	deterministic
stress groups	intonation group	observable (accent)	syntactic semantic	non-deterministic
intonation groups	package	observable (accent)	syntactic semantic	non-deterministic

(1) A word (or a syllable, cf. infra) is either clitic or non-clitic depending on lexical or morphemic properties (cf. infra). Non-clitic words are commonly said to carry word stress, but this is indeed merely a potential stress since non-clitic words need not be stressed always. (2) Clitic words are reorganized around the non-clitics, on the basis of the syntactic relation between the clitics and the non-clitic. The resulting unit, the stress group (SG), still carries virtual stress for the reason given above. (3) An intonation group (IG) is obtained when the speaker selects a particular tone sequence (from the sequences allowed by the intonation grammar) and combines it with a part of the segmental chain corresponding to one or more contiguous SGs. (4) Whereas the use of a tone sequence gives rise to the formation of an IG, the actual choice of the stressed tone (among other tones from the AF position) will determine the possible grouping of this IG with adjacent IGs in the chain. We use the term package to refer to a group of one or more IGs linked by the prosodic grouping mechanism. The following sections describe the units and rules for the different layers, starting with the lower one.

THE [±clitic] FEATURE

When a word can by its own form an SG or can constitute the centre of an SG and hence become an IG, it is non-clitic. Several criteria have been put forward to define the classes of clitic and non-clitic words: (a) *lexical identity*: for each lexical morpheme, state its [\pm clitic] feature (e.g. "man" is [-clitic]), (b) grammatical category (e.g. nouns are [-clitic]), (c) syntactic function (e.g. the subject is [-clitic]), (d) syntactic category (e.g. the noun phrase is [-clitic]). The difficulties for each of these criteria are discussed to a great length in Mertens 1993. In the following we will assume criterion (b) can be used.

In French, a language with *bound stress*, stress position is *predictable* from the limits of the SG; so there is no need to specify which syllable in the word carries stress. (This would be necessary in *free stress* languages.) For this reason, one can speak of [±clitic] syllables, where a non-clitic syllable is one that carries stress in a non-clitic word.

STRESS GROUP FORMATION

In the following examples clitic syllables are indicated by dots on the layer "WS" (for word stress) and non-clitic syllables by \circ signs; on the layer "SG", boundaries of SGs are indicated by brackets, and stressable syllables by the minus sign.

(1)		tu	le	vois,	cet	ad	mi	rab	le	bat	eau?	vois-tu	le	prob	lèm	e?
	WS			0				0			0	ο.		•	0	
	SG	(.	•	-)	(.	•	•)	(.	→ }	()(.	•	-)

<u>Rule 1</u>: A stress group is made up of a non-clitic word N_I and all contiguous clitic words that are governed by N_I (as in *tu le vois* or in *vois-tu*) or by another non-clitic word N_2 which in turn governs N_I (as in *cet admirable*).

As can be seen from *vois-tu* in (1), the stressable position can shift away from a nonclitic to a clitic syllable, at least in bound stress languages. It is this phenomenon which explains the need for two levels (WS and SG) in those languages.

However, when a clitic is separated from its governing non-clitic by one or more constituents with which it has no syntactic relation, that clitic too forms an SG (as for qui).

(2)		René,		René,		qui,		tu	le	sais	; bien,	ne	nous	aime	pas	tellement		• • •
	WS			0						0	0	•	•	•	•	•	0	
	SG	(·	-)	(-)	(.	٠)()	(.	•	-)	(-)(.	-)

INTONATION GROUP FORMATION

Example (3a-c) shows different forms of the same utterance, with a varying number of IGs. The IGs are surrounded by brackets on the layer labelled "IG". A plus sign indicates a syllable with a tone of the AF tone paradigm. The speaker can map an IG to every SG (as in (3a)), or he can combine many SGs into one IG (as in (3b)), provided the following syntactic constraint is met: an SG should be grouped with the SG it depends upon syntactically before it can be grouped with any other SG. So (3c) is wrong because *ainsi* is governed by *voir* and not by *attriste*.

(3)		c	le	la	voir	ain	si	m'	att	ris	beaucoup			
	WS				0		0			0			•	0
	SG	(-)	(.	-)	(-)	(- >
(a)	IG	(+)	(.	+)	(+)	(+)
(b)	IG	(+)	(+)
(c)*	IG	(+)	(.				÷)	(•	+)

<u>Rule 2</u>: An IG is made up of one or more contiguous SGs that are syntactically governed by an element that appears in the linear chain making up the IG.

Since a sequence of SGs can be arranged in several ways, i.e. with a variable number of IGs, the question arises about the semantic effect of the different arrangements. Multiple SGs merged into a single IG show a larger semantic cohesion; the IG forms a semantic unit. Moreover when tones with paradigmatic effects (such as *focus* or *paradigmatic contrast*) are used, their scope is limited to the elements within the IG, so the limits of the IG are essential for the semantic interpretation of the intonation pattern.

Mertens [1992] gives a further rule (<u>Rule 3</u>) that accounts for phonotactic constraints (the interference between syllable count and tones) in IG formation.

PROSODIC GROUPING AND PACKAGES

Any series of IGs shows an internal grouping which depends on the tones being used. In French this grouping is determined by the tones of the AF position, whereas in Dutch it is linked to tones of unstressed positions. Thus the grouping mechanism is once again language-specific. The rule for French follows (cf. Mertens[1990], *Règle de dominance*):

<u>Rule on prosodic grouping</u>: For any two successive IGs: if the tone in the AF position of the last IG dominates that of the first IG, then there is an embedding effect of the first IG within the second; otherwise, the two IGs are independent (juxtaposition).

Prosodic grouping is recursive: it can be applied to the units formed by a previous step. The term *package* is used to refer to the result of a grouping operation; a package contains one or more IGs.

PROSODIC GROUPING AND SYNTACTIC STRUCTURE

Many authors note that prosodic grouping has to conform to syntactic structure. It is commonly held that the prosodic boundaries (and therefore the prosodic grouping) should be *proportional* to the syntactic boundaries. This *correspondence view* is challenged by spontaneous speech data, as shown in Mertens [1993], where the following types of non-agreement are found.

1. Since the limits of packages are determined by those of the IGs, and eventually by those of the SGs, and since the latter can be either a constituent, part of a constituent, or more constituents, packages need not have the dimension of constituents.

2. The correspondence view implies the impossibility of having a major prosodic boundary at an internal boundary of a complex syntactic constituent. However, the speech data shows cases where a package merges a first constituent with only a part of the next constituent.

(4)		la	lec	ture	n'ét	ait	pas	eh	un	niv	/eau	auq	auquel		s'i	s'intéressait			
	WS		•	0	•	0	0			٠	0	0					•	0	
	SG	(.		~)	(.	-)	(~)	(.			-)	(.	-)	(.				-)	
	IG	(.		+)	(.		+)	(.			+)	(.	+)	(.				+)	
	IG	1	1	HH	1	1	HH	1.	• • •	1	HH	11	/LL	\1.			.1	HH	
	Р	(1)	(2)	(3)	(()	4)	
		qua	and	on fa	aisaí	t ur	ne tł	néo:	rie	de	la l	itt	érat	cure	2				
	WS	0	>		. 0				0					0					
	SG	(-	-) () (-)	(.				~)					
	IG	()			. +) (+)	(.				+)					
	IG	1.			1/LL	1	1	1	ΗH	1.			.\1	L-I					
	Ρ	((5)	5	5)										
		(((6)	6	5)			б))				

3. Since the prosodic grouping can only render a limited amount of hierarchical relations, the mechanism is unable to reproduce the entire syntactic structure, even for sentences of moderate syntactic complexity. So, at some point the agreement will fail.

4. Especially with contrasting tones (such as HL) one can find one or more constituents as the unstressed part of an IG, even with syntactically dominant elements.

These facts point to a new criterion for the syntax-prosody agreement.

<u>Rule 4</u>: IGs can be grouped in a package, and packages into larger packages, if the grouped elements are linked by a valency relation. There is no requirement for the inclusion of complete constituents.

The explicit representation of the levels of WS, SG; IG, and packages in the prosodic structure enable the relations between intonation, syntax, and morphology to be pinpointed and will hopefully bring about a better understanding of their interaction.

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