

A topologic view of Topic and Focus marking in Italian

Gloria Gagliardi

Department of Italian Studies
University of Firenze, Italy
gloria.gagliardi@unifi.it

Edoardo Lombardi Vallauri

Department of Linguistics,
University of Roma Tre, Italy
lombardi@uniroma3.it

Fabio Tamburini

Department of Linguistics and Oriental Studies
University of Bologna, Italy
fabio.tamburini@unibo.it

Introduction

Two corpora of spoken Italian (ArCoDip and CLIPS).

Topic and Focus recognition through:

A. Perception, based on prosodic patterns, of which part(s) convey the illocution of the utterance and which part(s) only provide accessory information [Cresti].

B. Evaluation, based on preceding context, of which information is active at utterance time and which information may be considered inactive [Chafe].

Only three main kinds of utterances were considered:

BROAD FOCUS, TOPIC | FOCUS, Narrow FOCUS | APPENDIX.

The resulting corpus was analysed automatically. Utterances were acoustically measured in order to locate the prominence by means of an automatic algorithm. Results were matched to those of subjective judgments (A) and (B).

Prominence Identification

There are a number of acoustic parameters that support prominence perception. We refer to the algorithm proposed by [Tamburini]. We can introduce a prominence function able to assign a continuous prominence level to each syllabic nucleus using only acoustic information:

$$Prom^i = \frac{W_{FA}}{W_{PA}} \cdot \left[SpEmph_{SPLH-SPL}^{i, dur^i} \right] + \frac{W_{PA}}{W_{FA}} \cdot \left[em_{ov}^i \cdot (A_{event}^i(at_M, at_m)) \cdot D_{event}^i(at_M, at_m) \right]$$

where $SpEmph_{SPLH-SPL}^i$ is the spectral emphasis, dur^i is the nucleus duration, em_{ov}^i is the overall energy in the nucleus and A_{event}^i and D_{event}^i are the parameters derived from the TILT model of the F0 profile as a function of the maxima alignment type $-at_M$ and the minima alignment type $-at_m$. All parameters are referred to the generic syllabic nucleus i .

Experiments

Experiment 1: 47 utterances extracted from the "Bonvino" corpus, a section of Ar.Co.Dip. (Italian spoken in Rome)

Experiment 2: 184 utterances extracted from corpus CLIPS (Italian spoken in Rome, Florence and Naples)

The results of both experiments, depicted in Table 1, show relevant regularities considering the position of the Main Prominence in relation to the kind of IS.

First of all, we can note that, considering each specific IS, there are no relevant differences between the Italian varieties: the distribution of the Main Prominences seems to follow similar patterns in the different Variety-Corpus pairs.

Second, the position of the Main Prominence tend to be placed at the border between the two IS components for the TOPIC | FOCUS and the FOCUS | APPENDIX IS, while, in case of BROAD FOCUS utterances, the overall picture seems to be less clear, even if a slight tendency of the Main Prominence to be at the end of the utterance can be found.

Figure 1 outlines these regularities for three example utterances: Aurelia_02 (TOPIC | FOCUS), Colosseo_04 (BROAD FOCUS) and Chiacchiere_42 (FOCUS | APPENDIX).

It is worth to note that a relevant number of the Main Prominences considered here (e.g. 14 samples out of the 47 extracted for this study from the "Bonvino" corpus) are supported mainly, or uniquely, by force-accent, as shown by the utterance Colosseo_37 in Fig. 1, meaning that no intonational phenomena contributed to support them.

Functional Interpretation

Demarcation rather than culmination

Topic-Focus:

- The majority of utterances have the Main Prom. at the Right of the Topic
- A minority seems not to distinguish between the two units, with comparable Prominences

Narrow Focus (at the Left):

- Always marked by the Main Prom. at the Right of the Focus

Broad Focus:

- About half of the utterances have the Main Prominence at the Right
- The other half have no Main Prominence, but several minor/equivalent Prominences

In sum, only constituents located at the left of the utterance (Topic or Narrow Focus), and more precisely the right end of such constituents, seem to be steadily associated to the Main Prominence.

Possible explanation:

Primary function of the Main Prominence may be demarcation, rather than culmination. Drawing a boundary, rather than "describing" an information unit.

This doesn't mean that different intonation patterns cannot express different kinds of Focus and Topic, effecting different types of illocutions and pragmatic functions.

But the bare presence and position of the Prominence (as it results from our measurements) may suffice to signal if the utterance contains a boundary between Information Units, and where.

The minimal cues that make the boundaries between information units recognizable to the addressee are shown in Table 2.

This would provide us with a quite simple explanation of:

- Why Topics are marked more strongly than Focuses (both Broad Focuses and Right Focuses after a Topic), though the communicative import of Focuses is greater than that of Topics.
- Why Narrow Focuses (at the Left) are also strongly marked.

It is an *exquisitely structural* explanation, more precisely a "topologic" one, of how the Prominence (at least in some Italian varieties) allows recognition of IS units; i.e. an explanation based only on the presence and position, not on the quality of Prominence and intonation contours:

"What is marked through the Main Prominence is the boundary between IS units"

Strictly speaking, the only qualitative difference needed is that between the marking of a Topic and the marking of a Left (Narrow) Focus, because both are followed by another unit.

That difference can be effected either by the intonation contour of the following unit (respectively a Right Focus or an Appendix), or (also, with some redundancy) by the specific intonational contours of the Topic and the Left Focus themselves.

Variety - Corpus	TOPIC FOCUS						No Main Prom
	LsT	LsF	LsA	IsT	IsF	IsA	
Rome-Bonvino	18	1	-	0	1	-	3
Rome-CLIPS	12	3	-	1	0	-	3
Florence-CLIPS	24	1	-	0	1	-	7
Naples-CLIPS	8	0	-	2	1	-	2

Variety - Corpus	BROAD FOCUS						No Main Prom
	LsT	LsF	LsA	IsT	IsF	IsA	
Rome-Bonvino	-	4	-	-	0	-	4
Rome-CLIPS	-	4	-	-	6	-	8
Florence-CLIPS	-	3	-	-	3	-	2
Naples-CLIPS	-	4	-	-	7	-	6

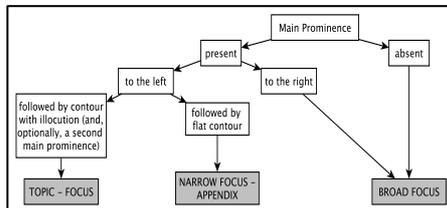
Variety - Corpus	FOCUS APPENDIX, Narrow F, Contrastive F						No Main Prom
	LsT	LsF	LsA	IsT	IsF	IsA	
Rome-Bonvino	-	14	0	-	2	0	0
Rome-CLIPS	-	22	1	-	2	0	2
Florence-CLIPS	-	14	1	-	1	0	2
Naples-CLIPS	-	25	0	-	6	0	0

Table 1: Number of utterances divided by Variety-Corpus pairs and configurations (e.g. LsT=Last syl. of T, IsF=Internal syl. of F). Some combination pairs are not possible; in those cases we have inserted a '-' in the corresponding cells.

IS unit	Beginning marked by:	End marked by:
Topic	Beginning of intonational contour / utterance	Main Prominence on last stressed syllable of the Topic
Right Focus after a Topic	Main Prominence on last stressed syllable of the Topic	End of intonational contour / utterance
Broad Focus	Beginning of intonational contour / utterance	End of intonational contour / utterance
Narrow Focus (at the Left)	Beginning of intonational contour / utterance	Main Prominence on last stressed syllable of the Focus and beginning of Appendix flat contour
Appendix	Main Prominence on last stressed syllable of the Focus	End of intonational contour / utterance

Table 2: Minimal perceptual cues for the recognition of IS units

The absence of a Main Prominence, or its being located on the last stressed syllable of the utterance, both signal a Broad Focus. The steps by which the addressee can "compute" the IS of an utterance are proposed in the following Scheme:



In this interpretation, speakers obey to a (non-)surprising extent to the law of least effort. The only elements strictly needed are (a) a Prominence, and (b) the difference between an "illocutionary" Focus contour and the contour of an Appendix, devoid of illocution.

Since the different Focus contours are independently needed to express the different illocutions of utterances (the different linguistic acts), the specific cost required for expressing IS is very low.

Marking each information unit with a culminative Prominence would cost more effort than simply marking the boundaries, since:

- Distinguishing Topic from Focus would require two different Prominences (one for each) instead of just one (at the boundary).
- Distinguishing Broad Focus from Narrow Focus would require two recognizably different Prominences, because also Broad Focuses would need a "dedicated" Prominence. Instead, language prefers to work in a more economic way, namely marking only... the marked element (i.e. Narrow Focus).

This situation is well represented in the corpus:

	Utterances corresponding to the description	Utterances not corresponding to the description
Rome - Bonvino	40 (85.10%)	7 (14.90%)
Rome - Clips	46 (71.88%)	18 (28.12%)
Florence - Clips	42 (71.19%)	17 (29.81%)
Naples - Clips	42 (68.85%)	19 (26.23%)
TOTAL	170 (73.59%)	61 (26.41%)

But there is more!

A continuum, rather than discrete alternatives

- A minority of the utterances perceived as Topic-Focus have no Main Prominence.
- A minority of the utterances evaluated as Broad Focuses have an internal Main Prominence, in a position similar to that of Topic-Focus structures.

In sum, utterances acoustically measurable as Broad Focuses can be perceived as Topic-Focus, and vice versa. This can be explained: Topic-Focus and Broad Focus are not separate and reciprocally exclusive structures, rather the extremes of a continuum. The middle of the continuum is occupied by utterances where the boundary between the units is not neatly marked, and the distinction between the two possible ISs remains under- or unspecified.

In other words, the speaker is not bound to decide between Topic-Focus and Broad Focus. At least not prosodically, possible disambiguation remaining entrusted to pragmatic and contextual factors.

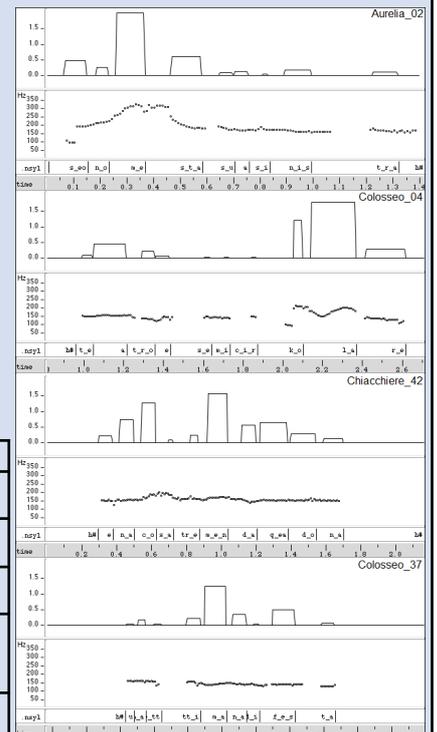


Figure 1: The prominence function profiles - Prom - and pitch profiles for some utterances considered in this study. Aurelia_02: "Secondo me T | stava sulla sinistra F". Colosseo_04: "Il teatro è semicircolare F". Chiacchiere_42: "E' una cosa tremenda F | quella donna A". Colosseo_37: "Una settimana F | di festa A".

This is even more true if we consider that the speaker and the addressee can evaluate prosodic cues differently, and the speaker is always aware of this. As a consequence, (s)he knows in advance that the perception of IS may be subject to a certain amount of fuzziness.

More radically, there is no reason to think that a content must necessarily be either 100% or 0% focused. Instead, any content can be focused at an unlimited variety of degrees, or even at a degree that simply remains underspecified.

Thus, no surprise if the Main Prominence is not always clearly recognizable. One should always expect for some utterances to have intermediate status between Topic-Focus and Broad Focus. And for the status of a certain amount of information, typically "in the middle", to be uncertain.

In sum, Topic vs. Focus seems not to be a black & white story, rather one in a grey scale.

This is the case for the following utterance:

lo | c'h'una specie di giglio

TOPIC | FOCUS



(The absence of a clear-cut distinction between Topic-Focus and Broad Focus corresponds to their being structures often possible in the same contexts, and to their often not influencing subsequent discourse in a decisively different way.)

If we consider all cases where IS remains underspecified between Topic-Focus and Broad Focus as consistent with the model, we obtain new figures:

	Utterances corresponding to the description	Utterances not corresponding to the description
Rome - Bonvino	43 (91.49%)	4 (8.51%)
Rome - Clips	55 (85.94%)	9 (14.06%)
Florence - Clips	53 (89.83%)	6 (10.17%)
Naples - Clips	52 (85.25%)	9 (14.75%)
TOTAL	170 (87.88%)	28 (12.12%)

Conclusions

- An abstract and merely structural, "topologic" concept of Prominence location can be conceived of, as endowed with the function of demarcation between units, before (instead of) their culmination and "description". This may suffice to explain much of the process by which speakers interpret the IS of utterances in discourse. Further features, such as the specific intonational contours of the different IS units, may thus represent a certain amount of redundancy.
- Real utterances do not always signal the distribution of Topic and Focus clearly. Acoustically, many remain underspecified in this respect. This is especially true for the distinction between Topic-Focus and Broad Focus, which indeed often has no serious effects on the progression of communicative dynamism in the subsequent discourse.
- The consistency of such results with the law of least effort, and the very high percent of matching between perceptual evaluations and automatic measurement, seem to validate the used algorithm.