Complex Illocutive Units in L-AcT: An Analysis of Non-Terminal Prosodic Breaks of Bound and Multiple Comments

Unidades Ilocucionárias Complexas na L-AcT: uma análise de quebras prosódicas não-terminais em Comentários Ligados e Comentários Múltiplos

Alessandro Panunzi
University of Florence, Florence, Italy
alessandro.panunzi@unifi.it

Valentina Saccone
University of Basel, University of Florence, Basel/Florence, Switzerland/Italy
valentina.saccone@unibas.ch

Abstract: This work presents a pilot study for a prosodic analysis of two different spoken structures in spoken Italian within the theoretical framework of the Language into Act Theory (L-AcT): (i) chains of two or more Bound Comments (COB) that do not form a compositional informative and prosodic unit; (ii) compositional Information Units formed by two or more Multiple Comments (CMM), linked together by a conventional prosodic model that implements specific meta-illocutive structures. This work analyzes COBs and CMMs from the DB-IPIC Italian Minicorpus. Different prosodic cues are taken into account: f_0 reset, pauses, final lengthening, intensity lowering and initial rush. The distinctive feature for COBs is a flat trend of f_0 before the boundary, with a low number of f_0 reset, while CMMs vary between different f_0 shapes. Vowel elongation and a no rushing speech rate cooperate in perceiving the prolongation of one COB into another. Initial rush is a characteristic feature of CMMs, while the lengthening of the last vowel of the unit is easier to find at the end of a COB than in a CMM.

Keywords: prosody; spontaneous speech segmentation; non-terminal breaks; L-AcT.

Resumo: Este trabalho apresenta um estudo piloto sobre uma análise prosódica de duas estruturas distintas em italiano falado, sob a perspectiva da Teoria da Língua em Ato (L-AcT): (i) cadeiras de dois ou mais Comentários Ligados (COB) que não formam

uma unidade informacional e prosódica composicional; (ii) unidades informacionais composicionais formadas por dois ou mais Comentários Múltiplos (CMM), ligados entre si por um modelo prosódico convencional que implementa estruturas metailocutivas específicas. Os COBs e CMMs analisados foram extraídos do *minicorpus* italiano disponível no DB-IPIC. Diferentes aspectos prosódicos são levados em conta: *reset* de f_0, pausas, alongamento final, abaixamento de intensidade e *rush* inicial. O traço distintivo para os COBs é uma tendência a achatamento de f_0 antes da fronteira, com um baixo número de *reset* de f_0, enquanto os CMMs variam entre diferentes formatos de f_0. Alongamento de vogal e uma velocidade de fala sem *rushing* cooperam na percepção do prolongamento de um COB naquele que o segue. O *rush* inicial é um traço característico dos CMMs, enquanto o alongamento da última vogal da unidade é mais fácil de encontrar ao final de um COB do que de um CMM.

Palavras-chave: prosódia; segmentação da fala espontânea; quebras não-terminais; L-Act

1 Introduction

This work presents a description and an analysis of prosodic breaks in spontaneous spoken Italian, starting from a selection of examples included in the DB-IPIC resource (PANUNZI; GREGORI, 2012).[1] DB-IPIC is a linguistic database developed for the study of information structure strategies and their comparison in different languages. This resource includes the informal part of the Italian C-ORAL-ROM spoken corpus (CRESTI, MONEGLIA, 2005) and three Minicorpora of Italian, Brazilian Portuguese (from C-ORAL-BRASIL corpus; RASO; MELLO, 2012) and Spanish (from Cor-DiAL corpus; NICOLAS MARTINEZ, 2012), each one with the same size and design.

The analysis presented in this paper is a pilot corpus-based study, which aims at describing the formal differences between different types of non-terminal breaks co-occurring with two specific Information Units, as they are defined in the theoretical framework of Language into Act Theory (L-AcT; CRESTI, 2000; MONEGLIA; RASO, 2014). More

---

[1] Freely available online at http://www.lablita.it/app/dbipic/

specifically, this work deals with the prosodic and formal features of the tone units corresponding to Bound Comments and Multiple Comments as described below, and delineates a base for future prosodic studies on this matter.

We analyzed a sample including a total of 37 non-terminal prosodic breaks taken from 13 different recording sessions and different speakers, with the purpose of bringing out segmentation issues through formal acoustic parameters. The objects of our analysis were prosodic acoustic parameters on both sides of the tonal breaks. In this paper, on one hand, we aim to delineate typical ending features of Bound Comments and Multiple Comments, in order to simplify and help recognizing these units in speech flow. On the other hand, this work aims to individuate possible prosodic marks on the beginning of the new unit, whatever it might be, thus analyzing prosodic patterns just after the signaled break. In order to evaluate them, we used the Praat software (BOERSMA; WEENINK, 2005).

Section 2 presents an introduction of the theoretical framework, and Section 3 deepens the nature and characteristics of the Information unit treated in the analysis. In Section 4 we present the examples extracted from the corpus. Section 5 introduces the prosodic parameters used for the analysis, that it is reported in detail in Section 6.

2 Language into Act Theory

2.1 Theoretical foundations

Language into Act Theory originates from Speech Act Theory (AUSTIN, 1962). It is based on the observation of a systematic correspondence between pragmatic and prosodic units in speech, empirically verified through observation and analysis of tonal contours. This correlation extends on two hierarchical levels, each one linking the formal level of prosodic realization with the functional plane of pragmatic values. The superordinate level deals with the correlation between Speech Act production and terminal prosodic profiles, namely the *illocutionary principle*. The lower level looks at the isomorphism between information structure and tone units, delimited by non-terminal boundaries, i.e. the *information patterning principle* (CRESTI, 2000). Starting from these principles, it becomes possible to carry out corpus-based studies on

spoken language pragmatics based on the perceptual data given by the prosody (CRESTI; MONEGLIA, 2010; MONEGLIA, 2011).

L-AcT assumes, with Austin, that the speech flow is mainly structured in sequences of pragmatically interpretable units, i.e. the Utterances, each one corresponding to the accomplishment of a Speech Act. From the formal point of view, prosody systematically signals the boundaries of each Utterance by means of a conclusive profile; moreover, different illocutions are encoded by different profiles. Therefore, L-AcT provides an explicit criterion for the identification of the fundamental units in the speech flow, based on the retrieval of perceptually relevant prosodic breaks: if an expression is so intonated that it can be pragmatically interpreted in isolation, then it will result in an Utterance.

Nonetheless, the functions of prosody in segmenting the speech flow are not limited to the identification of Utterances and their illocutive values. As a matter of fact, an Utterance can be formed by more than one tone unit, each one signaled by a non-terminal prosodic break. It has been observed that, within the sequence of tone units composing an Utterance, there is usually only one that turns out to be autonomous, while the others can be removed preserving the Utterance interpretability. This prosodic unit corresponds to the Information Unit of Comment, which is therefore necessary and sufficient for the accomplishment of the Speech Act. The expression of the illocutionary value that allows the Utterance interpretation is strictly based on how the Comment unit is prosodically realized,[2] and does not depend on its morpho-syntactic structure.

L-AcT proposes an original perspective regarding the definition of the information structure of the Utterance, since it is strictly related to the fulfillment of the illocution. Prosodic scanning marks the internal articulation of Utterances, the nucleus of which is constituted by the unit devoted to the accomplishment of the illocution.

To sum up, according to L-AcT prosody plays a crucial role in the realization of the Utterance and in its identification. Prosody is also the way the speaker expresses the illocutionary strength and makes the pragmatic interpretation of Utterances possible.

---

[2] The taxonomy proposed by Cresti distinguishes five general illocutionary classes – assertion, direction, expression, rite and refusal – determined by the attitudinal contents of the verbalization (relationship between speaker and interlocutor, emotional content, impulse and representation of action); all participants taking part in the conversation become fundamental objects of the speech act analysis.

2.2 Non-illocutive information units

Information units have either Textual or Dialogic functions. Textual Information Units contribute to the full semantic content of the Utterance. As we already stated, the Comment is the only unit needed to perform the Utterance; the other optional textual units act as a linguistic support for the adequate accomplishment of the Speech Act expressed by the nuclear Informative Unit. Table 1 reports the list of the optional Textual Units, with the tag used in the information labelling and a brief definition.

TABLE 1 – Optional Textual Units

NAME	TAG	BRIEF DEFINITION AND EXAMPLE
Topic	TOP	The domain of application for the speech act accomplished by the Comment. - **secondo me** /[TOP] ne dimostrava di più //[COM] *[in my opinion / she looked older than her age //]*
List of Topics	TPL	A chain of two or more Topics. - **gli ordini** /[TPL] e /[SCA] **le mansioni** /[TPL] ti saranno date direttamente da lui //[COM] *[directives / and / tasks / will be given to you directly by him //]*
Appendix of Comment	APC	An integration of the Comment text, either with fillers, repetitions, or delayed information. - era messa male /[COM] **la nonna** //[APC] *[she was in bad shape / the grandmother //]*
Appendix of Topic	APT	An integration of the Topic text. - ma da me /[TOP] **i' problema** /[APT] sarà più che altro l' esposizione //[COM] *[but for me / the problem / will mainly be the exposition //]*
Parenthesis	PAR	A meta-linguistic insertion related to the Utterance's content. - se li vedi /[TOP] **di sicuro** /[PAR] lo [/1][EMP] lo capisci //[COM] *[if you see them / for sure / you will understand it //]*
Locutive Introducer	INT	A specific unit introducing reported speech, a spoken thought, a list, a narration, or an exemplification. - **come dire** /[INT] ci penso io //[COM] *[you know / I'll take care of this //]*

On the contrary, Dialogic Units do not partake in the propositional content of the Utterance and have the function to boost the success of the communicative exchange. They are dedicated, for instance, to keeping the communicative channel open, expressing social cohesion in relation to the interlocutor, and taking or keeping the communicative turn. In Table 2 we list the different Dialogic Units:

TABLE 2 – Dialogic Units

NAME	TAG	BRIEF DEFINITION AND EXAMPLE
Incipit	INP	Opens the communication channel for turn-taking or for performing a contrast. - **senti ma** /[INP] questa è la famosa /[SCA] vacanza all' < Elba > ?[COM] *[listen / is this the famous / holiday on Elba ?]*
Conative	CNT	Pushes the addressee to take part in the exchange in an adequate way, inducing him to perform, stop, or avoid a communicative action. - ma che dici /[COM] **scusami** //[CNT] *[what are you talking about / sorry //]*
Phatic	PHA	Ensures that the communication channel stays open and that the dialogical exchange and its reception are maintained. - **ecco** /[PHA] poi questo /[TOP] è San Gottardo //[COM] *[here / then this / is San Gottardo //]*
Allocutive	ALL	Identifies the addressee of the Utterance, looking for his attention, and simultaneously establishing a personal connection with him. - queste son belle /[COM] **mamma** //[ALL] *[these are nice / mum //]*
Expressive	EXP	Works as an emphatic support of the exchange, dealing with social cohesion among participants of the communication event. - **huf** /[EXP] fai quello che vuoi //[COM] *[huf / do what you want]*
Discourse Connector	DCT	Connects different parts of the discourse, signaling to the addressee that the discourse is going on. - **allora** /[DCT] all'incirca sei settimane //[COM] *[so / more or less six weeks]*

Empirical studies (see CRESTI 2000; MONEGLIA; RASO, 2014) highlighted the presence of prosodic units that do not bring

any informative value. This is the case of disfluencies or interrupted sequences, as well as "scanning" phenomena. In this latter case, it happens that a single information unit is divided into two or more tone units, mostly for performance reasons; for instance, units with a long textual content may require the performance of two prosodic units. In this case, the prosodic pattern and the information pattern are not strictly isomorphic. The convention adopted in DB-IPIC considers the units on the left as "scanning" units (tag SCA), while the actual information value for the whole unit is annotated only on the last unit. Table 3 reports the list of the tag used for non-informative units.

TABLE 3 – Non-informative Units

NAME	TAG	DEFINITION AND EXAMPLE
Scanning	SCA	A prosodic unit that has no information function on its own, and the content of which is part of a larger IU. - anche qui /[TOP] **siamo** /[SCA] a Versailles //[COM] *[here/ it's / Versailles //]*
Interrupted	EMP	An interrupted unit that cannot be evaluated. - e questo è il babbo /[COM] **quando stavano +[EMP]** *[and this is dad / when they were +]*
Time Taking	TMT	A time-taking unit, used for programming needs and/or for keeping the turn. - **&he** /[TMT] no di Virgilio /[CMM] della sorella //[CMM] *[&hem / it's not Virgilio's / it's his sister's //]*
Unclassifiable	UNC	An unclassified unit due to insufficient acoustic data. - **xxx** /[UNC] tutto +[EMP] *[xxx / everything +]*

3. Bound Comments and Multiple Comments

As we mentioned earlier, according to L-AcT the Comment unit corresponds to the Utterance nucleus, since it plays the fundamental role of the unit that allows the pragmatic interpretability of the whole sequence.

Usually, a terminated sequence contains only one Comment carrying the illocutionary force of the Utterance. However, it is also possible that more than one independent unit bears an illocutionary value.

This is the case of two different spoken structures, retrieved through a corpus-based analysis.

The first structure is comprised of a chain of units with a homogeneous and weak illocutionary force, i.e. a sequence of Bound Comments (COB). From a prosodic point of view, the characteristic conclusive ending profile of Comments, which brings a singular illocutionary value, is not perceived. In the COB units, the f_0 shape has a continuative profile (which can vary across languages), so that the Comments in the sequence appear, indeed, "bound" together. The illocutionary value is here reduced, since a sequence of Bound Comments is functional to the realization of a unified "story": the purpose is to build an oral text more than to accomplish a single Speech Act (PANUNZI; SCARANO, 2009). Only the last unit of the chain brings a conclusive prosodic profile, so that it is conventionally signaled as a proper Comment unit (even if it partakes to the whole "bound" sequence).

COBs are typical sequences of monologues and storytelling, in which the exchange between speakers is infrequent. They often coincide with a succession of more than one semantic nucleus held together. Indeed, it is a type of progressive adjunction of speech flow, without a previous and systematic organization of the information. The sequence of Bound Comments allows the formation of another type of basic unit, larger than the Utterance, which has been called Stanza. The main feature of a Stanza is that the sequence of COBs fragments the illocutionary value into various segments which are gradually incremental: they are produced through an adjunctive process, without a strong illocutive activation and prosodic planning. Below are two examples of Stanza taken from the DB-IPIC Italian Minicorpus illustrating the progressive construction of the oral text, both building a narrative sequence. The first (1a) presents a succession of three Comments (two COBs and a COM), and the second shows six units linked together (1b)[3]:

---

[3] As examples show, other textual and dialogic units can be interposed within a sequence of COBs.

(1a)   *LIA: la mi' mamma era stata malata /^{COB} era &st [//2]^{EMP} come al solito /^{PAR} era stata all' ospedale /^{COB} e fu proprio il periodo /^{TOP} in cui /^{SCA} mio marito prese /^{SCA} l' azienda /^{SCA} col mi' babbo //^{COM} (ifamcv01_406)

*[*LIA: my mom was sick/ she was/ as usual/ she went to the hospital/ and it was right around the time/ during which/ my husband took over/ the business/ with my dad//]*

(1b)   *VAL: cioè /^{TMT} niente vabbè /^{PHA} si parte /^{COB} da Firenze /^{COB} eh /^{TMT} si fa i' check-in /^{COB} e si fa direttamente da [/1]^{EMP} da Firenze /^{COB} i' check-in /^{COB} eh /^{TMT} per New York //^{COM} (ifammn08_4)

*[*VAL: I mean/ right well/ we fly/ from Florence/ hm/ we check-in/ and directly from Florence/ we check-in/ hm/ to New York//]*

The second structure, Multiple Comments, occurs when a spoken sequence contains two or more Comments, each with its own illocutionary force, held together by a single melodic pattern that connects them. Thus, a higher Information Unit is formed, that is not separable in the interpretation and whose components are unified in a coherent prosodic configuration. It is called Multiple Comment unit (CMM) and it creates an *illocutionary pattern*, i.e. a sequence of illocutive information units within a compositional structure. Each unit has its own characterization and can be, in most cases, pragmatically interpreted.

It is possible to distinguish a CMM from a sequence of independent simple COMs through illocutionary compositional characteristics that are reflected in specific rhythmic and prosodic structures. In fact, this uniform and compositional set of Comments implements special relationships, explained by Cresti (2000) with a classification of meta-illocutionary models that need more than one information units to be executed and produce rhetoric effects, in particular: list, comparison, alternative, and reinforcement relations.

The list pattern is usually a ternary chain (in rare cases binary) of CMMs belonging to the same illocutionary type (e.g. assertions, suggestions, instructions, hypotheses, rhetorical questions, quotations). They contribute to creating a compositional repetition of the same illocutionary force. The main feature of the list is the rhythmic pattern that makes the CMM unitary. Generally, the first segment is prosodically stronger, the second less and the third has a standard conclusive prosodic

profile. The locutive contents of each CMM in the list may vary, but must be semantically coherent. The following are two examples of a list in the form of a Multiple Comment:

(2a)   *ART: pattina /CMM quadrante /CMM fianchi /CMM e maniglia // CMM(ifamdl04_46)

*[*ART: flap/ quadrant/ sides/ and grip//]*

(2b)   *LUI: sul /SCA rispetto /CMM la libertà /CMM quello e quell' altro // CMM (ipubcv01_420)

*[*LUI: about/ respect/ freedom/ that and that//]*

The comparison pattern is a (usually binary) composition of Comments belonging to the assertive class, or to the total questions. In general, the two locutionary contents are semantically complete, so that the second CMM duplicates the locutionary content of the previous one with some semantic variations, allowing the comparison between the two even in the absence of any explicit lexical mark. Below are two examples of comparison in (3a) and (3b):

(3a)   *CLA: noi la nostra /CMM e loro la loro //CMM (ifammn02_112)

*[*CLA: we have ours/ and they have theirs//]*

(3b)   *SAR: uno per la testata dell' offerta /CMM e l' altra per il corpo dell' offerta //CMM (ifammn17_11)

*[*SAR: one is for the head of the offer/ and the other for the body of the offer]*

The alternative pattern is a binary sequence of CMM, largely from the assertive and directive illocutions, which create the composition of two illocutionary forces (e.g. alternative question, alternative instruction, alternative order, total contrast). Normally, both locutive contents are semantically complete, although often the content of the first CMM is filled by a proposition, while the second by a simple phrase or a single word. The content of the two CMMs is always semantically related; see for example (4a) and (4b):

(4a)   *ALD: perché c' è chi vende /^{SCA} dieci /^{CMM} e chi vende cento ?^{CMM} (ifammn14, 91)

[*ALD: why some sell/ ten/ and other sell a hundred?]

(4b)   *ASS: bisogna vedere /^{SCA} se lei privilegia una rendita vitalizia / ^{CMM} oppure /^{DCT} un capitale alla scadenza //^{CMM} (ipubdl02_248)

[*ASS: we must see/ if you prefer an income for life/ or/ a lump sum at the end//]

Another binary sequence (and the most frequent in production) is the reinforcement pattern, composed by CMMs which belong to a homogeneous illocutionary type; this sequence creates a composition of the two illocutionary forces, which are confirmation, rejection, invitation, agreement, doubt, belief, hypothesis, or related to the class of rites. The locutive content of the first CMM is often filled by an interjection, adverb or stereotyped expression, while the second or the last CMM is filled by a locution that strengthens and makes the message explicit and semantically complete. In other cases, this structure can be inverted, with a first part corresponding to a complete sentence or a phrase and the reinforcement being comprised of a single interjection. There are many cases of reinforcement with functional recall, in which one of the CMM performs the recall function and is combined to a main illocution, usually a directive one. Below, two examples of reinforcement Multiple Comments:

(5a)   *LIA: già /^{CMM} tu ha' ragione //^{CMM} (ifamcv01_68)

[*LIA: yes/ you're right//]

(5b)   *EST: proprio una chicca /^{CMM} sì //^{CMM} (ifamdl15_339)

[*EST: really doozy/ yes//]

The two spoken structures just described – Bound Comments and Multiple Comments – characterize together less than the 20% of terminated sequences in spoken Italian (PANUNZI; MITTMAN, 2014).

It is worth highlighting that CMM and COB have different theoretical statuses that reflect on the identification of the reference units for spoken language analysis speech. From a theoretical point of view, the pattern of CMMs composes a sort of higher-level informative unit that

globally functions as a unique Comment; on the contrary, the sequence of COBs forms a chain of independent units that are bound together by adjunction, out of an overall planning. Moreover, as it has been observed by Panunzi and Mittman (2014), the two structures completely differ in their distributional properties (PANUNZI; MITTMAN, 2014). Data from both Italian and Brazilian Portuguese show that COM-Utterances and CMM-Utterances[4] are similar with regard to their distribution within dialogic interactions and monologic ones, whereas Stanzas (i.e. sequences of COBs) are much more frequent in monologues. The similarities between both types of Utterances (COM and CMM) also extend to their information structure, in which most of the units are simple, i.e. there are no other Information Units except for the Comment (single or Multiple). In contrast, most Stanzas have a complex structure containing at least one optional textual or dialogic IU.

For these reasons, we assume that there is an overall distinction between Utterances (alternatively with COM or CMM as nuclear units) and Stanzas (with COB as nuclear units) as the basic entities for speech segmentation.

4. Examples from DB-IPIC

We investigated the differences between several types of non-terminal breaks, i.e. the ones characterizing Bound and Multiple Comments. As we mentioned above, we carried out an analysis of a set of units extracted from the DB-IPIC Italian Minicorpus. The sample is a qualitative selection composed by 8 Stanzas, with a total of 19 non-terminal COB breaks, as well as 13 Utterances with a total of 18 non-terminal CMM breaks, thus presenting a total of 37 prosodic breaks. The set works as a pilot study for future analysis on a larger collection of COBs and CMMs.

We chose Utterances and Stanzas from 14 different speakers, in conversations (3 speakers), dialogues (6 speakers), and monologues (5 speakers) from the corpus, both familiar (11 speakers) and public (3 speakers). The first criterion for the utterances selection was the audio

---

[4] We distinguish Utterance types with respect to the illocutive unit that constitute their nucleus: COM-Utterances are characterized by single Comment nuclear unit, while CMM utterances are characterized by a Multiple Comment nuclear unit.

quality, as we selected the ones with the greatest possible acoustic spectrogram clarity. We then selected speech turns without overlapping.

Selected COBs try to be prototypes of stanzas, with at least three illocutive units[5] and without final or internal interruptions, since they cannot be confidently evaluated. Whereas, Multiple Comment units were chosen to represent the different CMM types according to Language into Act Theory – list, alternative, comparison, reinforcement. All of the above were patterns of two units, except for four lists of three units.

The following sections will list the transcriptions of analyzed audio tracks, divided into two groups: Section 4.1 contains the Bound Comments and section 4.2contains the collection of illocutive patterns of Multiple Comments, grouped into the different CMM-types. The beginning of each line gives information concerning the name of the speaker in upper case marked with an asterisk. Then the following transcription of the speech is annotated, with the LABLITA tag set (CRESTI; MONEGLIA, 1997; CRESTI; MONEGLIA, 2005; CRESTI; PANUNZI, 2013), which is a variant of CHAT format for speech transcription (MACWHINNEY, 1991). Following the examples, in brackets, the name of the text to which the segment belongs to in the corpus is specified, with a number used to identify the sequence in the whole text. Each sequence ends with a terminal break and is internally divided into prosodic units through non-terminal breaks. The question mark is used to demarcate a terminated sequence with a rising prosodic profile (as the ones in interrogative or request utterances); double slash, instead, is the standard sign used for terminal breaks, which characterizes conclusive sequences neither interrupted (usually signaled with "+") nor intentionally suspended by the speaker (MONEGLIA, 2005) (indicated with "…") Single slash (/) is used for non-terminal breaks. A double or single slash followed by a number, both contained in square brackets,[6] indicate retracting (i.e. false start, MONEGLIA, 2005) phenomena; *n* corresponds to the number of retracted words. Boundaries of false starts do not contribute to the informational patterning or to the semantic content of the Utterance; hence they are not counted as a proper type of non-terminal breaks.

---

[5] The sample contains Stanzas with a maximum of six COBs; however, they are mostly composed by three units.

[6] In the form of [/n] or [//n].

4.1 Examples of Bound Comments

(6) *LIA: la mi' mamma era stata malata /COB era &st [//2]EMP come al solito /PAR era stata all' ospedale /COB e fu proprio il periodo /TOP in cui /SCA mio marito prese /SCA l' azienda /SCA col mi' babbo //COM (ifamcv01_406)

*[*LIA: my mom was sick/ she was/ as usual/ she went to the hospital/ and it was right around the time/ during which/ my husband took over/ the business/ with my dad//]*

(7) *FRA: e poi /INP perché /INT cioè /PHA non vo' porta' la figliolina lì /COB non la vo' manda' dalla baby-sitter /COB non vo' chiamare i suoceri che son già a i' mare /COM forse //PAR (ifamdl12_330)

*[*FRA:and then/ because/ you know/ she doesn't want to bring her kid there/ doesn't want to take her to the sitter/ doesn't want to phone her in-laws who are down the shore/ maybe//]*

(8) *EST: lei /TOP prima veniva tutte le settimane /COB poi /i-COB purtroppo /PAR gl' è successo un problema alla su' mamma /COB un incidente grosso /COB per cui /DCT ora viene /SCA una volta ogni venti giorni //COM(ifamdl15_102)

*[*EST: she/ used to come here every week/ then/ unfortunately/ her mom had a problem/ a serious accident/ so/ now she comes/ once every twenty days//]*

(9) *CLA: nel quartiere /COB di fratellanza //COM(ifammn02_68)
*[*CLA: in the neighborhood/ between brothers //]*

(10) *CLA: perché /DCT quella strada la facevano a piedi /COB con la mandria /COM eh //PHA(ifammn03_161)

*[*CLA: because/ that street they were walking/ with the herd/ eh//]*

(11) *VAL: cioè /TMT niente vabbè /PHA si parte /COB da Firenze /COB eh /TMT si fa i' check-in /COB e si fa direttamente da [/1]EMP da Firenze /COB i' check-in /COB eh /TMT per New York //COM(ifammn08_4)

*[*VAL: I mean/ right well/ we fly/ from Florence/ hm/ we check-in/ and directly from Florence/ we check-in/ hem/ to New York//]*

(12)   *VAL: quindi nulla /COB l' aereo è in orario /COB quindi tranquillamente /COB bene //COM(ifammn08_7)

[*VAL: and so/ the plane is in time/ and so easy/ ok//]

(13)   *GCM: magari con un /SCA testo facile /COBche [/1]EMP che ti piace a te /COB e provare /i-COM per esempio /PAR a farli leggere // COM(ipubdl05_188)

[*GCM:maybe with an / easy book/ that/ that you like/ and try/ for example/ to let them read it//]

4.2 Examples of Multiple Comments

A) List type:

(14)   *ART: pattina /CMM quadrante /CMM fianchi /CMM e maniglia // CMM(ifamdl04_46)

[*ART: flap/ quadrant/ sides/ and grip//]

(15)   *NIC: togliamo il resto /CMM ingrandiamo /CMM facciamo solo loro //CMM(ifamdl17_279)

[*NIC: we take the rest off/ we enlarge them/ and do just them//]

(16)   *ALD: questo valeva per la Puglia /CMM come pe' la Calabria /CMMo per la Campania //CMM(ifammn14_44)

[*ALD: that goes for Puglia/ as for Calabria/ or for Campania//]

(17)   *SAR: ora niente più lire /CMM niente più dollari //CMM (ifammn17_109)

[*SAR: now no more lira/ no more dollars//]

(18)   *LUI: sul /SCA rispetto /CMM la libertà /CMM quello e quell' altro // CMM (ipubcv01_420)

[*LUI: about/ respect/ freedom/ that and that//]

B) Comparison type:

(19)   *CLA: noi la nostra /CMM e loro la loro //CMM(ifammn02_112)
[*CLA: we have ours/ and they have theirs//]

(20)   *SAR: uno per la testata dell' offerta /CMM e l' altra per il corpo dell' offerta //CMM (ifammn17_11)

[*SAR: one is for the head of the offer/ and the other for the body of the offer //]

C) Alternative type:

(21)   *ALD: perché c' è chi vende /SCA dieci /CMM e chi vende cento ?CMM (ifammn14_91)
[*ALD: why some sell/ ten/ and other sell a hundred?]

(22)   *ASS: bisogna vedere /SCA se lei privilegia una rendita vitalizia /CMM oppure /DCT un capitale alla scadenza //CMM (ipubdl02_248)
[*ASS: we must see/ if you prefer an income for life/ or/ a lump sum at the end//]

D) Reinforcement type:

(23)   *LIA: già /CMM tu ha' ragione //CMM (ifamcv01_68)
[*LIA: yes/ you're right//]

(24)   *ELA: sì /CMM a Roncobilaccio //CMM (ifamcv01_398)
[*ELA: yes/ in Roncobilaccio//]

(25)   *EST: proprio una chicca /CMM sì //CMM (ifamdl15_339)
[*EST: really doozy/ yes//]

(26)   *SAR: sì /CMM son io //CMM (ifammn17_30)
[*SAR: yes/ it's me//]

Once the representative sample of Bound Comments and Multiple Comments were selected, we then chose the parameters through which conducting the analysis, as set out below.

5 Acoustic Parameters

In order to approach the issue of differentiating between non-terminal breaks of COB and CMM units, we analyzed phenomena across the prosodic boundaries, both left and right, for all units found after the break.[7] We took into account different prosodic cues correlating with their perception: f_0 reset; pauses; final lengthening; intensity lowering; initial rush of the following unit (CRUTTENDEN, 1997; HIRST; DI CRISTO, 1998).

F_0 reset was measured in Hertz (Hz). It states differences in pitch range between two adjacent intonation units, namely the difference between the f_0 contours before and after the boundary break (SORIANELLO, 2006). We quote Δf_0 as a percentage of f_0 range in each Utterance/Stanza. Appreciable absolute value of Δf_0 is >18% ('T HART, 1981), i.e. at least three semitones. When the f_0 shape changed trend, we annotated the direction of the intonation movement before and after the boundary break: when it was upward, downward or flat on either side of the border. The flat prosodic contour is the case of no significant variation in f_0 values.

Pauses were measured in milliseconds (ms). We evaluated pauses after the boundary break, if present. Appreciable pauses are >180 ms, following Duez (1982, 1985), in which a silent pause is any interval of oscillographic trace where the amplitude is indistinguishable from the background noise – threshold values range from 180 to 250 ms.[8] According to Moneglia (2005) instead, a perceptively relevant silence in speech continuum has to be longer than 250 ms. Nevertheless, our sample showed no evidence of pauses shorter than 250 ms.

---

[7] Our methodological choice was not to distinguish non-terminal breaks on the basis of the next unit since the study is intended as a first step in the formalization of prosodic breaks. Thereafter, the analysis' aim is to integrate such distinctions, thus taking into account possible prosodic cues determined by characteristics of specific units.

[8] According to CMU Open Source Speech (https://cmusphinx.github.io/) Recognition Software, the smallest pause duration output is 180ms. The same threshold has been adopted by Lundholm Fors (2015).

Final lengthening was measured in milliseconds (ms). It indicates an increase of duration in the last vowel before the boundary break (CHEN, 2007). Appreciable lengthening is >10ms than the mean vowel duration by each speaker. This value was chosen following previous studies (LEHISTE, 1976), where it appears that, in the range of the durations of speech sounds, the just-noticeable differences in duration are between 10 and 40 ms. We used a trimmed mean calculated after discarding the highest and the lowest value, except for the cases of Utterances/Stanzas shorter than 6 V-to-V, where a V-to-V is an acoustic segment delimited by two vowels, measured in seconds from the starting of the first vowel to the starting of the second one (BARBOSA, 2007). The trimmed mean is less sensitive to outliers than the mean, but it still gave a reasonable estimate of central tendency. Where necessary, the outcome was verified also by analyzing other speech segments by the same speaker.

Intensity lowering was measured in decibels (dB). It states a fall in "strength" of articulation. Starting with observations of intensity variation, we recorded the decrease of decibel level just before the boundary breaks (SORIANELLO, 2006).

Initial rush was measured in n(V-to-V)/s. Initial rush indicates a speed up of speech flow at the beginning of a new unit after the boundary break, as a difference of speech rate. The speech rate is useful in order to give the listener a global sense of speed value and to compare various rate levels (OLIVEIRA COSTA; MARTINS-REIS; CÔRREA CELESTE, 2016). We calculated and compared a mean rate per each unit and a local rate for the first two V-to-V segments after the non-terminal break. There is an appreciable acceleration of speech rate – initial rush – with a $\Delta_{\text{Speech Rate}}$ >10%. The value has been conventionally chosen according to what is detectable to the ear.

The choice of these variables aims at investigating and differentiating COBs and CMMs internal breaks from an acoustic point of view and underlining possible connections between different prosodic cues. In order to take into account the abovementioned parameters, all audio tracks were analyzed through the Praat software and its features of spectrum, pitch and intensity analysis, and the annotation text to sound. They were first divided into Information Units in order to analyze the

f_0 shape; they were then examined with Praat tools as spectrum, pitch, intensity and annotation text-grid tool; the audio tracks were than manually segmented in V toV units.

6 Analysis

This section contains the analysis derived from the study of the parameters described above. The following tables report a synthesis of the results of the analysis per each break. Every mentioned parameter is here mentioned per each examined non-terminal prosodic break. Table 4 shows COBs breaks, while Table (5) is for CMM's breaks.

Guidelines for reading the tables: every break is indicated with the name of the text from which it comes and the ID number, followed by the example number in the above-listed transcriptions (in brackets). Values under the minimum threshold – according to the parameters described above– are in brackets; a blank cell means that the phenomenon does not occur in that specific break. Right and left f_0 trends respect to the boundary are expressed dividing the two paths with a slash. F_0 reset is mentioned as a Δf_0 percentage: a negative Δf_0 percentage is indicated when the reset is up/down and vice versa a positive value for the down/up reset. The "IL" column reports data on intensity lowering; the table takes into account if it is present or not coinciding with breaks. In the same way of f_0 reset, the initial rush is also mentioned as a percentage. As per the vowel duration, in the final lengthening column the number indicated reflects the increase in milliseconds of the last vowel in respect to the mean duration per each speaker.[9]

---

[9] The duration measurements shown in the tables have been obtained without a previous normalization of segments. However, we consider the results to be accurate since we did not compare absolute values measurements of different speakers, but only percentages.

TABLE 4 – Analysis of Bound Comment non-terminal breaks

TEXT	n. break	PARAMETERS					
		f_0 trend	f_0 reset	IL	pause after break	rush after break	final lengthening
ifamcv01_406 (6)	6a	down/down		✓			
	6b	flat/flat	(11,4%)	✓	359 ms		+108 ms
ifamdl12_330 (7)	7a	down/down		✓		27,7%	+123 ms
	7b	down/down		✓			+53 ms
ifamdl15_102 (8)	8a	flat/flat	(6%)	✓			
	8b	flat/flat		✓		15,9%	
	8c	flat/flat		✓			
ifammn02_68 (9)	9a	flat/flat		✓		77,8%	+245 ms
ifammn03_161 (10)	10a	down/up	(-4,8%)	✓		(2,9%)	
ifammn08_4 (11)	11a	down/up		✓		121,2%	+67 ms
	11b	down/flat		✓			+83 ms
	11c	flat/up	-43,3%	✓	351 ms		+134 ms
	11d	flat/flat	(-5,7%)	✓		(3,5%)	
	11e	flat/flat	(-11,4%)	✓			+226 ms
ifammn08_7 (12)	12a	down/flat		✓			
	12b	down/flat		✓			
	12c	down/up		✓			
ipubdl05_188 (13)	13a	down/flat		✓			
	13b	flat/flat		✓		55,5%	+77 ms

TABLE 5 – Analysis of Multiple Comment non-terminal breaks, divided
in type-groups

TEXT	n. break	PARAMETERS					
		f0 trend	f0 reset	IL	pause after break	rush after break	final lengthening
List							
ifamdl04_46 (14)	14a	down/flat	(-3,4%)	✓	371 ms		
	14b	flat/up	(13,1%)	✗		16,3%	
	14c	down/down	(14,3%)	✗		48,7%	
ifamdl17_279 (15)	15a	flat/flat		✗		14,5%	
	15b	down/down	28,8%	✗			
ifammn14_44 (16)	16a	down/flat	-37,1%	✗		153,3%	
	16b	down/down	-21%	✓	473 ms		+71 ms
	17a	down/up		✓		11,5%	+54 ms
ipubcv01_420 (18)	17a	down/flat		✓		65,3%	
	17b	flat/flat	(-13,2%)	✓			
Comparison							
	19a	down/down		✓		(1,8%)	
ifammn17_11 (20)	20a	flat/flat	-29%	✓	417 ms		+109 ms
Alternative							
ifammn14_91 (21)	21a	down/down	(13,7%)	✓		26,9%	
ipubdl02_248 (22)	22a	down/up		✓	337 ms		+142 ms
Reinforce							
ifamcv01_68 (23)	23a	flat/flat	26%	✓		75,6%	+50 ms
ifamcv01_398 (24)	24a	down/down		✓		54,1%	
ifamdl15_339 (25)	25a	flat/down	-28,2%	✓		69,8%	
ifammn17_30 (26)	26a	up/down		✓			

The analysis shows that COBs have a homogeneous trend to a flat f_0 shape: no big changes of value were recorded in Bound Comments, with just one break with an appreciable f_0 reset (absolute value of Δf_0 around 43%; see example 11a).The sample presents eight cases of flat shape on both sides of the prosodic break (see examples 6b, 8a, 8b, 8c, 9a, 11d, 11e, 13b) and other four with a downward left profile and flat right profile relative to the break (see examples 11b, 12a, 12b, 13a). Furthermore, COBs ending profile was flat in nine of the examples and downward in the other ten, while the start of the new unit assumed more variable shapes, including the upward profile (see examples 10a, 11a, 11c, 12c), without clear preferences.

Regarding pauses, none of them after the analyzed breaks was shorter than 250 ms. Two pauses were found after a COB break (see examples 6b, 11c). A lengthening of the final vowel foreran all of these pauses, which were never followed by an initial rush. There were seven other cases of vowel final lengthening. They appeared to be longer than the CMMs final lengthening, to the extent of doubling the duration of the vowel or more in three cases (see examples 6b, 7a, 11e). It is interesting to analyze this data taking into account that the mean vowel duration in COBs was 12 ms longer than in the CMMs unit: the difference was just over the minimum noticeable mark (110 ms for COBs and 98 ms for CMMs). Furthermore, a final lengthening in vowels was present in half of the selection of COB's non-terminal breaks.

Each COB-break had a corresponding intensity lowering, while an initial rush in the following unit followed seven breaks. The increase of speech rate ranged from 3% to 121% values. Following the parameters description above, we consider relevant values when higher than 10%, as the ones observed after five breaks (see examples 7a, 8b, 9a, 11a, 13b), with just one acceleration exceeding 100% (see example 11a).

Mean values of speech rate were not so different between COBs and CMMs and ranged between 5.3-5.5 V-to-V/s.

As an example of COB analysis, Fig. 1 represents the spectrogram of break 7b: the f_0 profile is presented in blue, down before and after the break. The intensity line is shown in yellow, with a decreasing profile before the break. The orange arrow underlines the segment occupied by the last vowel of the first COB, lengthened in comparison with the medium vowel duration of the speaker.

FIGURE 1 – Analysis of COB break 7b
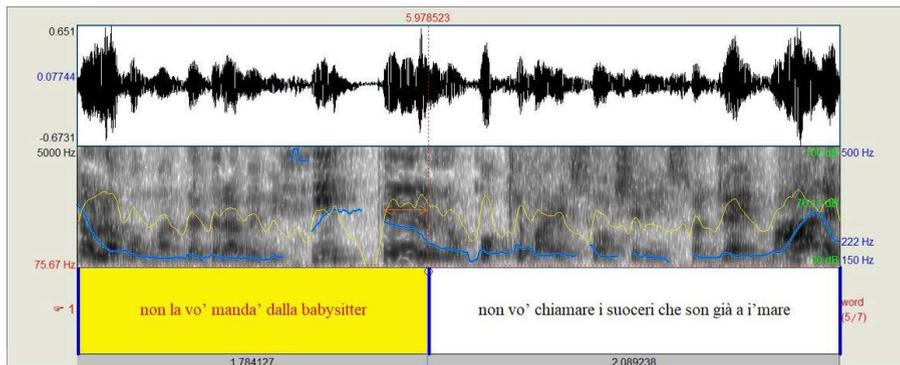
On the other hand, the analysis of the CMM boundaries shows big differences in f_0 ranges between the prosodic breaks. We recorded six appreciable resets, both up/down (see examples 16a, 16b, 20a, 25a) and down/up (see examples15b, 21a). Their absolute values of Δf_0 varied between around 21-37%, and five Δf_0 <18%, when looking at the absolute values (see examples 14a, 14b, 14c, 18b, 21a); there was a wider f_0 shape variation trend when compared to the COBs group, with the presence of an upward trend before the break too (see example 26a).

The analyses of the selected audio tracks showed pauses which were noticed after four CMM's breaks (see examples 14a, 16b, 20a, 22a); three pauses were longer than the two recorded between COBs. Only one of them – part of a list-type pattern – was not preceded by a final vowel lengthening (see example 14a). As for COBs, there was initial rush recorded following pauses. Two additional cases of final lengthening occurred before breaks (see examples 17a, 23a). Thus, there were five final lengthening examples in total, with an increase of duration lower than the lengthening observed in COBs, as written above, with two cases of vowel twice the duration of the mean value (see examples 20a, 22a).

When looking at the intensity lowering, five of the analyzed breaks did not present a corresponding decrease in intensity value (see examples 14b, 14c, 15a, 15b, 16a). In all such cases, prosodic breaks were part of a list-type CMM. Moreover, CMMs gave rise to an initial rush in a much easier manner compared to COB's – eleven rushes with a total amount of 18 breaks – with an increasing of speech rate that ranged

between around 2-153% values. Values >10% were observed after ten breaks (see examples 14b, 14c, 15a, 16a, 17a, 18a, 21a, 23a, 24a, 25a), i.e. twice the numbers of COBs, with one acceleration peak >100% (see example 16a).

As an example of CMM analysis, Fig. 2 represents the spectrogram of break 23a: in blue it is possible to see the f_0 profile, which was flat before and after the break. On the right side of the figure, measures of f_0 before and after the break show the f_0 reset from 80.83 Hz – the final point of the first segment – to 172 Hz – the starting point of the second segment. The intensity line is shown in yellow, with a decreasing profile before the break.

FIGURE 2 – Analysis of CMM break 23a
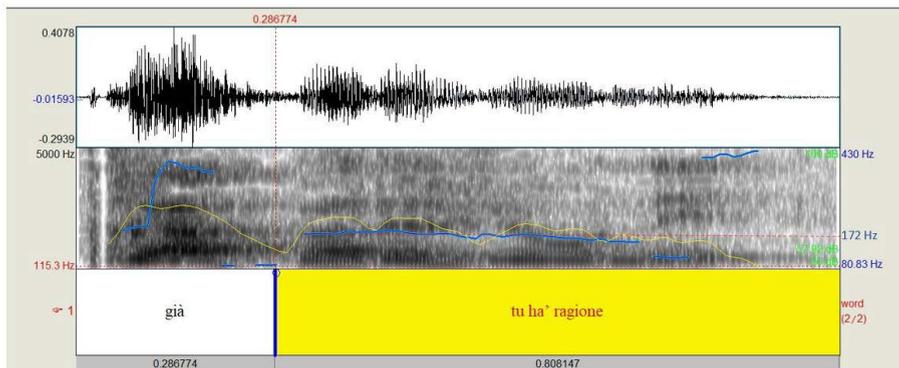
7. Final remarks

Approaching this analysis, we had to face the need for formal parameters to study prosodic features and, especially, the need for fixed thresholds per parameter. It was, therefore, important to specify our set of analytical tools and parameters, based on previous studies but not only. In particular, we chose a conventional value for an appreciable acceleration of speech rate – the initial rush according to what was detectable to the ear, with the aim of better defining the threshold on a perceptual basis.

The aim of this study was to compare features at both sides of the prosodic boundary which are perceived in the speech flow and, in view of the results, the analysis suggests some correlations between the different parameters.

To sum up, every pause after a non-terminal break, whether a COB's or a CMM's ones, is always preceded by a final lengthening of the last vowel of the relevant unit and never followed by an increase in speech rate. Furthermore, the coincidence between intensity lowering and a non-terminal break fails only for list-type Multiple Comments and it is easier to observe a final lengthening at the end of a Bound Comment unit.

As we explained, one of the main characteristics of the Bound Comment is that the end of the f_0 shape continues in the following units, so that the Comments appear, namely, bound together. Thus, in line with our expectation, the distinctive features of Bound Comment are non-terminal breaks with a flat trend of f_0 shape before the boundary, with a low number of f_0 reset, while, on the other hand, Multiple Comments vary between different f_0 shapes on either side of the boundary, which are rarely flat and most of them have a reset.

Furthermore, vowel lengthening and a no rushing speech rate both have an effect in perceiving the prolongation of one COB into another: the results indicate therefore that initial rush is a typical feature of Multiple Comments, while the lengthening of the last vowel of the unit is easier to find at the end of a Bound Comment compared to CMMs.

Moreover, the decision to divide the results about CMMs in different types has been helpful in order to underline the differences between patterns, such as the contrast between lists and the other types concerning the co-presence of non-terminal break and intensity lowering. Of course, it is necessary to replicate the tendencies which were found in our sample by investigating a larger set of consistent cases.

Since our analysis was carried out on a pilot sample, it is clear that these hypotheses need to be tested on a larger set of spoken sequences. It will be interesting to analyze whether or not new observations will reflect the partial results of this sample, in particular concerning the differences in values of initial rush between COBs and CMMs and the properties change between CMM-patterns. Further examples could confirm the COB correlation with the absence of an upward f_0 profile just before the prosodic break, as was suggested in our sample.

The absence of a rising profile is a remarkable result, given that the typical signal of continuity between prosodic units requires an upward direction on the last section of the f0 profile. Instead, our sample shows that the last syllable does not present a rising phenomenon, but rather the profile is downward or flat. Future studies could deepen the

observation of the previous syllables, the tonic one in particular, as well as the comparison with non-COB continuity signal or rising profile.

Thus, our aim is to extend the analysis to the entire DB-IPIC Italian Minicorpus. This work, implemented with an automatic segmentation of spoken tracks in V-to-V, could also lead to an improved identification and the tagging of Bound Comments and Multiple Comments in DB-IPIC, also when interrupted sequences occur in the speech flow.

Authors' contribution

The authors conceived and discussed together all the content of this paper. However, their own contribution can be specified as follows: Alessandro Panunzi directed the research, provided the examples from DB-IPIC corpus, and wrote Sections 1-3; Valentina Saccone carried out the prosodic analysis and wrote Sections 4-7.

References

AUSTIN, J. L. *How to Do Things with Words*. Oxford: Oxford University Press, 1962.

BARBOSA, P. A. Análise e modelamento dinâmicos da prosódia do português brasileiro. *Revista de Estudos da Linguagem*, Belo Horizonte, v. 15, n. 2, p. 75-96, 2007. Available from: <http://www.periodicos.letras. ufmg.br/index.php/relin/article/view/2449/2403>. Access on: Jan. 10, 2018.

BOERSMA, P.; WEENINK, D. *Praat: Doing phonetics by computer*. 2005. Software. Available from: <http://www.praat.org/>. Access on: Jan. 10, 2018.

CHEN, A. Language specificity in the perception of continuation intonation. In: GUSSENHOVEN, C.; RIAD, T. (Org.). *Tones and Tunes*. v. II: Experimental Studies in Word and Sentence Prosody. Berlin: Mouton De Gruyter, 2007. p. 107-141.

CRESTI, E. *Corpus di italiano parlato*. Firenze: Accademia della Crusca, 2000.

CRESTI, E.; MONEGLIA, M. (Org.). *C-ORAL-ROM. Integrated reference corpora for spoken romance languages*. Amsterdam: John Benjamins Publishing Company, 2005.

CRESTI, E.; MONEGLIA, M. Informational patterning theory and the corpus based description of Spoken language. The compositionality issue in the Topic Comment pattern. In: MONEGLIA M.; PANUNZI A. (Org.). *Bootstrapping Information from Corpora in a Cross Linguistic Perspective*. Firenze: Firenze University Press, 2010. p. 13-46.

CRESTI, E.; MONEGLIA, M. L'intonazione e i criteri di trascrizione del parlato. In: BORTOLINI, U.; PIZZUTO, E. (Org.). *Il progetto CHILDES Italia*. Pisa: Il Cerro, 1997. v. II, p. 57-90.

CRESTI, E.; PANUNZI, A. *Introduzione ai corpora dell'italiano*. Bologna: Il Mulino, 2013.

CRUTTENDEN, A. *Intonation.* 2. ed. Cambridge: Cambridge University Press, 1997.

DUEZ, D. Silent and Non-Silent Pauses in Three Speech Styles. *Language and Speech*, Kansas, v. 25, n. 1, p. 11-28, 1982.

DUEZ, D. Perception of silent Pauses in Continuous Speech. *Language and Speech*, Kansas, v. 28, n. 4, p. 377-389, 1985.

HIRST, D.; DI CRISTO, A. (Org.). *Intonation Systems:* A Survey of Twenty Languages. Cambridge: Cambridge University Press, 1998.

LEHISTE, I. Suprasegmental Features of Speech Use. In: LASS, N. J. (Org.). *Contemporary Issues in Experimental Phonetics*. New York: Academic Press, 1976. p. 225-239.

LUNDHOLM FORS, K. *Production and Perception of Pauses in Speech*. 2015. 141p. Dissertation (Doctoral) – University of Gothenburg, 2015. Available from: <https://gupea.ub.gu.se/bitstream/2077/39346/1/gupea_2077_39346_1.pdf>. Access on: Jan. 10, 2018.

MACWHINNEY, B. *The CHILDES Project.* Tools for analysing talk. Hillsdale, NJ: Lawrence Erlbaum Associates, 1991.

MONEGLIA, M. The C-ORAL-ROM Resource. In: CRESTI, E.; MONEGLIA, M. (Org.). *C-ORAL-ROM. Integrated reference corpora for spoken romance languages*. Amsterdam: John Benjamins Publishing Company, 2005. p. 1-70.

MONEGLIA, M. Spoken corpora and pragmatics. *Revista Brasileira de Linguística Aplicada*, Belo Horizonte, v. 11, n. 2, p. 479-519, 2011.

MONEGLIA, M.; RASO, T. Notes on the Language into Act Theory. In: RASO T.; MELLO H. (Org.). *Spoken Corpora and Linguistic Studies*. Amsterdam: John Benjamins Publishing Company, 2014. p. 468–495.

NICOLAS MARTINEZ, C. *Cor-DiAL*. Corpus oral didáctico anotado lingüísticamente. Madrid: Liceus, 2012.

OLIVEIRA COSTA, L. M.; MARTINS-REIS, V. de O.; CÔRREA CELESTE, L. Methods of analysis speech rate: a pilot study. *CoDAS*, São Paulo, v. 28, n. 1, 2016. Available from: <http://www.scielo.br/pdf/codas/v28n1/en_2317-1782-codas-28-01-00041.pdf>. Access on: Jan. 10, 2018.

PANUNZI, A.; GREGORI, L. DB-IPIC. An XML database for the representation of information structure in spoken language. In: PANUNZI A.; RASO T.; MELLO H. (Org.). *Pragmatics and Prosody.* Illocution, Modality, Attitude, Information Patterning and Speech Annotation. Firenze: Firenze University Press, 2012. p. 133-150. Available from: <http://www.lablita.it/app/dbipic/>. Access on: Jan. 10, 2018.

PANUNZI, A.; MITTMAN, M. The IPIC resource and a cross-linguistic analysis of information structure in Italian and Brazilian Portuguese. In: RASO T.; MELLO H. (Org.). *Spoken Corpora and Linguistic Studies*. Amsterdam: John Benjamins Publishing Company, 2014. p. 129-151.

PANUNZI, A.; SCARANO, A. Parlato spontaneo e testo: Analisi del racconto di vita. In: AMENTA L.; PATERNOSTRO G. (Org.). *I parlanti e le loro storie.* Competenze linguistiche, strategie comunicative, livelli di analisi: Atti Del Convegno Carini-Valderice. Palermo: Centro di studi filologici e linguistici siciliani, 2009. p. 121-132.

RASO, T.; MELLO, H. (Org.). *C-ORAL-BRASIL I*: Corpus de referência do Português Brasileiro falado informal. Belo Horizonte: Editora UFMG, 2012.

SORIANELLO, P. *Prosodia.* Modelli e ricerca empirica. Roma: Carocci, 2006.

'T HART, J. Differential sensitivity to pitch distance, particularly in speech. *The Journal of the Acoustical Society of America*, USA, v. 693, p. 811-821, 1981.