



## Modeling conversational styles in Italian by means of overlaps

*Rodolfo Delmonte*

Department of Language Sciences - Università Ca' Foscari  
Ca' Garzoni-Moro - San Marco 3417 - 30124 VENEZIA

### Abstract

Conversational styles vary cross-culturally remarkably: communities of speakers – rather than single speakers - seem to share turn-taking rules which do not always coincide with those shared by other communities of the same language. These rules are usually responsible for the smoothness of conversational interaction and the readiness of the attainment of communicative goals by conversants. Overlaps constitute a disruptive element in the economy of conversations: however, they show regular patterns which can be used to define conversational styles (Ford and Thompson, 1996).

Overlaps constitute a challenge for any system of linguistic representations in that they cannot be treated as a one-dimensional event: in order to take into account the purport of an overlapping stretch of dialogue for the ongoing pragmatics and semantics of discourse, we have devised a new annotation schema which is then fed into the parser and produces a multidimensional linear syntactic constituency representation.

This study takes a new tack on the issues raised by overlaps, both in terms of its linguistic representation and its semantic and pragmatic interpretation. It will present work carried out on the 60,000 words Italian Spontaneous Speech Corpus called AVIP, under national project API - the Italian version of MapTask, in particular the parser, to produce syntactic structures of overlapped temporally aligned turns. We will also present preliminary data from IPAR, another corpus of spontaneous dialogues run with the Spot Differences protocol. Then it will concentrate on the syntactic, semantic and prosodic aspects related to this debated issue.

The paper will argue in favour of a joint and thus temporally aligned representation of overlapping material to capture all linguistic information made available by the local context. This will result in a syntactically branching node we call OVL which contains both the overlapper's and the overlappee's material (linguistic or non-linguistic). An extended classification of the phenomenon has shown that overlaps contribute substantially to the interpretation of the local context rather than the other way around. They also determine the overall conversational style of a given community of speakers with cultural import.

### 1. Introduction

A distinctive feature of any conversation is the way in which people interrupt each other: ideal conversations would be constituted by a smooth sequence of turn-taking moves which the speakers may predict by means of conventional hints – mainly short pauses or specific intonational contours. However it is a fact that whenever speakers have a communicative goal to attain – and this is what happens in the great majority of conversations – they also want to do it following Grice's Maxims. Conversations should then be guided by principles of

efficiency and effectiveness. This is very much so in case conversants have a task guiding their conversation as happened in our dialogues, which include the Italian version of Map Task and the task called Spot Differences. It is conceivable that in this case conversants are put under pressure and their conversational strategies will certainly come to the fore much more clearly than what might happen in more relaxed scenarios. However, as will be shown clearly below, this may only apply to certain communities of speakers and not to others. As reported in the literature the way in which overlaps are used by a given community can vary remarkably from a supportive to a competitive manner. In our case, overlaps will also be used as redundant means for supportive information, notably by Neapolitan and Roman speakers.

This paper presents work carried out at the University of Venice for the characterization of conversational styles in four regional Italian varieties which include, Southern (Pugliese) Italian, Tuscan (Pisano) Italian, Neapolitan (Campano) Italian and Roman (Central) Italian. The specific topic of this paper will be the characterization of overlaps along the lines of what has been done in MATE project and other international projects in progress like the MEETING project. In the AVIP/API dialogues the quantity of overlapping speech is very high, as we shall see below. At an international level, even though everybody agrees on the relevance of the phenomenon, there is no universal agreement on its representation from the linguistic point of view, in particular as concerns syntactic structure both at constituent and functional level.

The definition of OVERLAP in the literature on conversational studies is rather cumbersome: this is due in our opinion to a tendency to mix up pragmatic imports with semantic and sometimes syntactic ones. In some cases, also ethnographic elements have been brought in, where a colonialistic point of view has been used to sanction natives' communicative interchanges as being unruled because of the high number of interruptions and overlaps. In other cases, it would seem that gender imports come into play to differentiate between a competitive and a collaborative use of overlaps and interruptions.

One first argument was the terminological issue related to the function of the overlap, either as an interruption by the intruder speaker or simply as a continuer - a backchannel or a confirmation word.

A second argument brought to bear on the definition of overlap was the outcome of the interruption, where it causes the intruder speaker to usurp the floor or not, and in this second case whether the current speaker was obliged to repair his utterance as a reaction to the interruption, or not.

A third argument was the place at which the overlap occurs, whether it is at a TRP, Transitional Relevance Place in which case also syntactic completion of some kind was involved - this was defined, for lack of a better linguistic basis, whenever a predicate was present. Or in case it is in a Nontransitional

Relevance Place: these two terms also hinged on the semantic completeness of the already uttered turn by the current speaker.

A fourth argument relied on the recognition on the side of the overlapper of the incoming TRP and the irrelevance of the completion of the turn on the side of the current speaker, so that an interruption in the middle of the turn could still be interpreted as collaborative.

A final more decisive factor is the computability of overlaps in terms of its predictability.

As far as predictability is concerned, data are often conflicting: it would seem that males are more prone to produce interruptions in order to show their desire/tendency to compete, if compared to females who are more oriented towards collaborative and cooperative attitudes in conversations. This could be used to predict conversants' behaviour with respect to their gender/sex: however this is not universally borne out so it is easily contradicted. I will not quote colonialists'-like opinions on the way less educated communities handle conversations if compared to more educated ones. This is also not proven and can also be dismissed on social equity principles.

Sachs et al. introduced the concept of conversational rules and Grice introduced the concept of conversational maxims: however none of these rules and maxims can be used to predict the actual progress of turn interaction in real dialogues.

The only criterion that can be safely regarded to be useful for such an important issue as computability should in our opinion come from experimental data: and in this regard, they can be derived from syntactic structure or from acoustic/linguistic analysis of F $\emptyset$  movements. As reported in Shriberg et al., these two parameters may be taken to represent possible anchors for an algorithm for overlaps predictability. It would seem that whenever overlaps occur at TRPs they would do so because of turn-change projectability from the current speaker: this is usually linked to the presence of a Boundary Tone; while on the contrary the presence of a High Tone would indicate a less likely projectable TRP, hence a desire by the speaker not to be interrupted by its interlocutor. In turn, the overlapper may simply produce a semantically empty Turn Unit, a backchannel or an affirmative continuer, to express his/her wish for the current speaker to continue. A viable syntactic-semantic definition of TRP can only be formulated on the basis of a treebank available or a parser able to compute any spontaneous dialogue text without having to go through its output manually. In our case we will use the treebank which we semi-automatically built for the Italian National Project on spontaneous speech based on the Italian MapTask and the Spot Differences Dialogues.

Our treebank will not only allow us to derive a precise definition of TRP but also to classify all overlaps accordingly. This is due to a peculiar feature of the constituency which contains a distinct major constituent for overlaps, called OVL, which contains both the overlapped and the overlapping linguistic material in the actual location in the turn in which the interruption took place.

## 2. Overlaps

Overlaps may be defined as a speech event in which two people speak simultaneously by uttering actual words or in some cases non-words, when one of the speakers, usually the interlocutor, interrupts or backchannels the current speaker. This phenomenon takes place at a certain point in time where it is anchored to the speech signal; but in order to be fully parsed and subsequently semantically interpreted, it needs to be referred semantically both to a following turn and to the local

turn where it may produce conversational moves to repair what has been previously said by the current speaker.

One of the distinctive characteristics of naturalistic conversation (in contrast to monolog situations) is the presence of overlapping speech. Overlapping speech may be of several types, and affect the flow of discourse in various ways. An overlap may help to usurp the floor from another speaker (e.g., interruptions), or to encourage a speaker to continue (e.g., back channels), or simply end up just in an attempt at usurping the floor without success. As a preliminary and tentative pragmatic definition we may define an overlap as being normally a physical event that happens in a single time unit in which two or more speakers want to communicate different and non-coincident communicative intentions. Exception made for rare cases in which the two or more speakers intended to say the same thing in the same time unit.

Speaker overlaps, are directly observable in our data, since by definition overlaps occur at points of simultaneous speech on more than one of the (individually recorded) channels, besides their explicit indication in the ortho-phonetic transcription thus transliterated into the orthographic transcription. What we are interested in is finding out whether there is any correlation between the onset of overlaps and their possible characterization from the point of view of syntactic structure, which we have proposed to treat by introducing a node of discourse constituency called OVL (overlap), from where the two temporally aligned components of overlapping, the overlappee and the overlapper stretch of speech/text, branch.

Both punctuation and overlap have been discussed in the literature as correlating with prosodic cues. For example, past computational work has discussed prosodic features for sentence boundaries as well as disfluency boundaries. Past work in conversation analysis, discourse analysis, and linguistics has shown prosody to be a useful cue in turn-taking behavior. So we may assume that overlapping can be safely be described also in prosodic terms or lends itself to use prosody as a linguistic correlate to linguistic descriptions.

### 2.1. Overlaps: why caring about them in the first place?

Why detecting and labeling Overlaps is so important? These are the most important reasons for taking care of them:

- They are very frequent;
- They may introduce linguistic elements which influence the local context;
- They may determine the interpretation of the current utterance;

and for these reasons, they cannot be moved to a separate turn because they must be semantically interpreted where they temporally belong. After moving overlaps to their original temporal position, as a side-effect, some turns are just empty conversational moves because the speaker has already been taking the turn with a previous overlap which may have been followed by a repairing move of the other speaker thus conversationally concluding the communicative exchange.

### 2.2. Overlaps and Syntax

As said above, overlaps challenge all criteria of linguistic representation which require the input sentence to be mono-dimensional, i.e. to contain the utterance of one single speaker. This fact is semantically essential in order to guarantee the linguistic representation to be interpretable. On the contrary, overlapped linguistic material, i.e. sentences which contain at the same time linguistic material coming from two or more

participants in the dialogue are not only hard to parse: they might also constitute an obstacle to semantic interpretation.

As in most robust parsers, we use a sequence or cascade of transducers: however, in our approach, since we intend to recover sentence level structure, the process goes from partial parses to full sentence parses. Sentence and then clause level is crucially responsible for the right assignment of arguments and adjuncts to a governing predicate head. This is clearly paramount in our scheme which aims at recovering TRPs by referring solely to syntax.

The sequential processors receive the input sentence split by previous processors, which is recursively/iteratively turned into a set of non-sentential level syntactic constituents. Non-sentential level constituents, can be interspersed by heads which are subordinate clause markers, or parentheticals markers. The final output is a list of headed syntactic constituents which comprise the usual set of semantically translatable constituents, i.e., ADJP, ADVP, NP, PP, VC (Verb Cluster). In addition to that, sentence level markers interspersed in the output are the following: FINT, interrogative clause marker; DIRSP, direct speech clause marker; FP, parenthetical clause marker; FC, coordinate clause marker; FS, subordinate clause marker; F2, relative clause marker.

The task of the following transducer is that of collapsing into the corresponding clause the clause material following the marker up to some delimiting indicator that can be safely taken as not belonging to the current clause level. In particular we assume that at each sentence level only one VCluster can appear: we define the VC as IBAR indicating that there must be a finite or tensed verb included in it. VClusters containing non-tensed verbal elements are all defined separately, as follows: SV2, for infinitive VCs; SV5, for gerundive VCs; SV3, for participial VCs.

The second transducer has also two additional tasks: it must take care of ambiguity related to punctuation markers such as COMMA, or DASH, which can either be taken as beginners of a parenthetical or indicators of a list, or simply as separators between main clause and subordinate/coordinate clause. It has also the task of deciding whether conjunctions indicated by FC or by FS are actually starting a clause structure or rather an elliptical structure.

### 2.3. An example of parsed overlapped dialogue

As to orthographic transcription, the decisions taken in the Italian MapTask was to follow the original transcription schema and conventions: in particular, overlaps are fully marked in the local speech aligned orthographic transcription, by introducing the index of the turn containing the overlapping material, which however is not visible and should be looked up in the following turn. In addition, two #s are introduced at the front of the turn index and at the end of the overlapped speech as shown in the following example:

#### Dialogue 2.

p1#94: no <sp> cioè sì c'ha<aa> <mh> <sp> una specie di tappo

p2#95: sì #<p1#96> c'ha un ta+ tappo <sp># , sì

p1#96: #<p2#95> di funghetto# <lp> c'ha prima una base un po' altina

#### Dialogue 2.1

p1\_94: no, cioè sì c'ha, una specie di tappo.

p2\_95: sì ov\_42 di funghetto < c'ha un ta\_ tappo - >, sì.

Turn 95 contains an overlap which is introduced and erased from the following turn and indexed as shown in 4.1 version of the dialogue: the convention being that the ov\_42 index is followed by the overlapper's speech intruding in the overlappee's turn. The material being overlapped then follows the open '<' and the close of the overlap is marked by the closing '>'. In this way the orthography linearizes the bidimensional event of the overlap by keeping the linguistic material within the same turn as adjacent text rather than scattering it in different turns. The ownership of the material by one of the speakers is guaranteed by its local respective position within the boundaries of the overlap: the ov\_N starting symbol and the '>' at the end. It is important to notice that the two words are respectively pronounced by a woman and a man, the intruder utters with a rising tone: the implicit communicative intention is that of producing a better indication of the shape of the object currently under discussion and trying to get the other speaker to accept it.

The utterance contains a short pause <sp> right after the overlap which is then followed by an affirmative interjection "sì"/yes: this is a very common feature of overlaps in our corpus, a confirmation is a conversational act reacting to the overlapping material, which however is not present in the current utterance since it has been moved to the following turn. As can be understood by recomposing the overlapping portions of this conversation, what really happens is that the two speakers, Speaker 1 and Speaker 2 are interacting very closely while the description of the scenario is carried on. At the same time at which a certain shape is individuated and properly described a consensus is reached: but this is reached by trial and errors in a continual re-approximation of the task. There are two internal repairs caused by the overlap: the first one is "sì"/Yes as a reaction of Speaker 2 to a first definition of the shape "tappo"/cork, which is however taken only as being suggestive "una specie di"/a kind of, of a better yet to be defined final shape. And in the Speaker 2 turn, the repetition of "tappo" which is intentionally interrupted by recovering the turn role and suggesting the most appropriate shape, "di funghetto"/of a little mushroom.

#### Dialogue 2.b

da(turn(p2\_95),cp(intj(si'), ovl(overlap(ov\_42), spd(pd(di), sn(n(funghetto))), par(<), f(ibar(expl(c), vc(ha))), compc(sn(art(un), abbr(ta\_), sn(n(tappo))))), par(par), overlap(>)), punt(virg), cp(intj(si'))), punto(.))

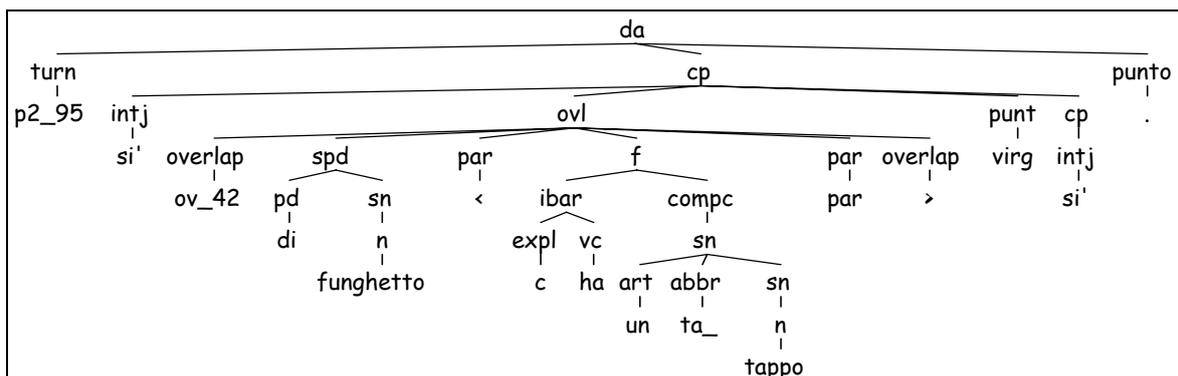


Figure 1: Syntactic Structure for Dialogue 2.b with temporally aligned overlap

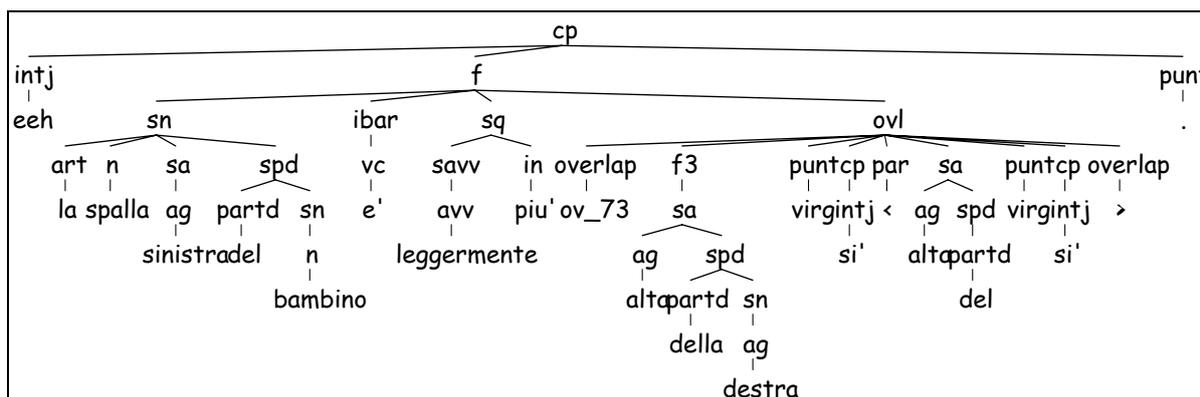


Figure 2: Syntactic Structure for Dialogue 3 with temporally aligned overlap and linguistic material on the right.

The realignment of all turns has given as a result a certain number of empty turns, i.e. all those turns which had been artificially built by simply containing overlapping material which had been already uttered by the current speaker before the previous turn was elapsed.

The need to represent linguistic information related to two speakers in the same syntactic structural representation, which is both semantically and pragmatically strongly intertwined has a lot of theoretical implications.

This implements principles of linguistic representation expressed in previous work of ours, in particular in Delmonte, (1987), where syntactic structure was to interact with semantic and pragmatic structure in order to take into due account phenomena like Contrastive and Emphatic Focus. *Discourse Grammar* which is crucially grafted onto rules of sentence grammar; does not directly relate to unconscious and innate LAD mechanisms but stems and develops on extralinguistic, contextual/situational or pragmatic conditions.

As a matter of fact, no neat division should be drawn between these two theoretical domains, apart from empirical reasons, i.e. in order to reduce interfering factors which do not contribute in an essential way to the construction of an internal grammar. In particular, the realm of performance, being the less studied if compared to competence, contains quite a number of such interfering factors. We might also surmise that a lot of performance (as such describable within a discourse grammar) interferes strongly with competence (Bresnan, 1982: xxiii) leading to an interactive (see Marsley-Wilson, Tyler, 1980), model for discourse understanding, rather than a sequential one.

Interpretation could be triggered independently from sentential material or be determined by the presence of corefering extrasentential expressions; as a further option, it

could be triggered locally by logical operators which in turn may vary their scope according to the presence of extrasentential factors.

- In other words, to allow for feedback to take place between the two levels of grammatical relations, we need discourse level phenomena to be adequately represented by sentence grammar. This is certainly the case with the case we are tackling now: overlaps take place at a discourse level, however their import is deeply grafted into sentence grammar, by conditioning interpretation from taking place.

Consider now another interesting example represented by the following utterance, where the overlapper corrects the current speaker – the overlappee – who, as a consequence of that, drops its utterance and confirms what the overlapper said. “*eeh, la spalla sinistra del bambino è leggermente più ov\_73 alta della destra, sì > alta del, sì <.*”/the left shoulder of the child is slightly more ov\_73 high than the right one, yes > high of the, yes <.”

Whose syntactic structure is,

```
cp(intj(eeh),f(sn(art(la),n(spalla),sa(ag(sinistra)),spd(partd(
del),sn(n(bambino))))),ibar(vc(e')),sq( savv(avv(leggerment
e)),in(piu')),ovl(overlap(ov_73),f3(sa(ag(alta),spd(partd(del
la),sn(ag( destra))))),puncp(virg),cp(intj(si')),par(>),sa(ag
(alta),spd(partd(del))),puncp(virg),cp(intj(si')), overlap(<))),
punto(.))
```

### 3. Overlaps and Conversational Moves

After creating the treebank, overlaps have been organized as follows:

- Overlaps occurring between specifier and head;

- Overlaps occurring in a parallel and unintentional simultaneous way;
- Overlaps which are semantically empty and are computable as backchannels;
- Overlaps at a higher constituency level, i.e. at sentence level or after main predicate and main complement has been computed.

In Table 2. and 3. below we show both absolute and percent values of all overlaps distributed in the four locations where the two tasks have been recorded. As can be easily gathered, Napoli is the seat where in absolute terms most overlaps have occurred; it is also the place where in absolute and – together with Rome – in relative terms, most semantically empty overlaps occurred. Rome is the place where in relative terms most semantically empty overlaps occurred; it is also the place where the least number of spec/head overlaps occurred. Bari, is the seat where in absolute terms the least overlaps have occurred: it is also the place where in relative terms we find the least semantically empty; in addition to that, it is the place where the most specifier/head overlaps occurred and the most TRP relatable overlaps occurred. Eventually, Pisa is the seat where most parallel overlaps occurred.

Our proposal will then be articulated as follows:

- TRP coincides with sentence level or whenever main complements have been parsed and we are left with adjuncts;
- Non-TRP coincides with all the remaining cases, i.e. when the overlap starts between the specifier and the head of a constituent when still in preverbal position; or else whenever the overlap is positioned at the constituent boundary but the main governing predicate has not been parsed yet.

Case A. thus constitutes the semantically valid option corresponding to a projectable smooth TRP with/without overlap; on the contrary, case B. constitutes the non-semantically viable option where the conversant does not have enough semantic content to project a TRP and simply wants to prevent the current speaker from continuing his turn. If this is so, we will also divide up all Overlaps into two categories: Competitive vs. Collaborative we end up with the following general subdivision,

- Competitive Overlaps – Parallel + Spec/Head
- Collaborative Overlaps – Semantically Empty – Higher than Constituent

### 3.1. Overlaps and Dropping

Another important indicator of the actual import of an overlap is the relation intervening between an overlap and the completion of the turn by the current speaker. An overlap that also marks a dropping of turn by the current speaker who yields his turn to the overlapper can be computed differently according to whether the overlap takes place at the end of the turn or not. This is due to the fact that in normal conversational interaction speakers would be in the conditions to forecast when the current turn is ending and would produce an overlap past the TRP to speed up the attainment of the communication task.

On the contrary, dialogues by speakers who use overlaps turn internally would contain a lot of cases of Continuing Conversation in presence of Overlaps: these we call Non Dropping Overlaps (hence NDOs). It is a fact that NDOs may only occur in a competitive situation: either within what we defined Parallel Overlap or within a Spec/Head Overlap. We may interpret the occurrence of NDO as an indication of a collaborative attitude between the interactants: in presence of

an overlap, people continue speaking. Turns containing more than one Overlap are 98 overall. To these cases of NDOs we add all cases in which speakers alternate short and long pauses with overlaps during a long turn without the overlapper actually usurping the floor.

We computed NDOs for all dialogues and the overall picture we get is that, Bari has the least number of NDOs, Napoli on the contrary has the highest number thus confirming our previous conclusion. Naples conversational style has as a specialty the exploitation of overlaps as a means to make dialogues more communicative, most redundant and least efficient. Nonetheless, this is accepted as a rule by conversants of the same regional variety and is regarded as an effective tool.

**Table 1.** Disaggregated Overlaps data in all Dialogues in absolute values.

Sites / Overlaps	Overlap Totals	Competitive Overlaps	NDOs	% NDOs	% NDOs wrt. Competitive
Bari	142	64	14	9.89	21.87
Napoli	909	318	275	30.25	86.47
Pisa	264	122	32	12.12	26.22
Rome	189	66	19	10.05	28.78
Totals	1504	576	340	22.6	59.02

**Table 2.** Disaggregated Overlaps data in all Dialogues in absolute values.

Sites / Overlaps	Overlap Totals	Specifier head Overlaps	Parallel Overlaps	Semantically Empty Overlaps	Higher Constituency Level Overlaps
Bari	142	53	11	25	53
Napoli	909	221	97	333	258
Pisa	264	64	58	70	72
Rome	189	42	24	77	46
Totals	1504	380	190	505	429

**Table 3.** Disaggregated Overlaps data in all Dialogues in percent values.

Sites / Overlaps	Overlap Totals	Specifier head Overlaps	Parallel Overlaps	Semantically Empty Overlaps	Higher Constituency Level Overlaps
Bari	9.44	<b>31.2</b>	7.8	17.6	<b>31.2</b>
Napoli	<b>60.43</b>	24.31	10.67	<b>36.33</b>	26.38
Pisa	17.55	26.12	<b>21.96</b>	26.51	27.27
Rome	12.56	22.22	12.69	<b>40.74</b>	24.33
Totals	100	25.26	12.63	<b>33.57</b>	28.52

## 4. Overlaps and Prosody

As said above, overlaps computability can be derived from syntactic-semantic structure or from acoustic/linguistic analysis of FØ movements: data coming from these two experimental areas may be taken to represent possible anchors

for an algorithm for overlaps predictability. It would seem that whenever overlaps occur at TRPs they would do so because of turn-change projectability from the current speaker: this is usually linked to the presence of a Boundary Tone; while on the contrary the presence of a High Tone would indicate a less likely projectable TRP, hence a desire by the speaker not to be interrupted by its interlocutor.

To test these hypotheses, we analysed the prosodic content of those overlaps constituting interruption at constituent level and we found a strong correlation with the acoustic signal. We thus analysed all semantically relevant overlaps and classified them by means of ToBI representations. Results are shown in the Table here below where we report data related only to the AVIP/API corpus.

We measure two different set of phenomena: semantically and pragmatically relevant overlapped turns, then phonetically relevant overlapped turns and then compared them with Competitive Overlaps. At first we marked overlapped turns with relevant semantic information, i.e. turns in which contrasting information is expressed by one or both of the speakers; we then marked all turns containing relevant F $\emptyset$  movements, i.e. tones marked H\* and H+L\*. Overlapped turns with contrasting information are only 1/3 of all turns, with Naples going down to 1/4 and Bari up to 1/2. Then we counted tones in Competitive Overlaps (COs) as defined on the basis of syntactic structure and we called them Relevant Tones (RTs). Eventually we counted those COs containing Relevant Tones (RTs) and these are reported in Tab.4. As can be seen, the prediction expressed by means of syntactic information is also born out by phonetic data. In particular, percent values for relevant tones, i.e. relevant F $\emptyset$  movements in Competing Turns is very high, over 70%. Finally, Competing Overlaps with RTs are half of all competing overlaps: with the notable exception of Neapolitans who do not use intonational cues to drive their competing overlaps preferring to use redundant non competing or collaborative means. On the contrary, Bari speakers accompany their competitive overlaps with phonetic cues in a totally predictable and systematic manner, reaching 100% of all COs.

**Table 4:** Semantic and Phonetic data of Relevant Tones for Competitive Overlaps in AVIP/API Corpus.

Sites / Overlaps	Competitive Overlaps Totals	Total Relevant Tones (RTs)	No. Of COs with Rts Totals %
Bari	142	64	100.00
Napoli	674	318	45.28
Pisa	264	122	65.57
Totals	1080	576	50.00

## References

- Delmonte R., 2005, Parsing Overlaps, in B.Fisseni, H.C.Schmitz, B. Schroeder, P. Wagner (Hrsg.), Sprachtechnologie, mobile Kommunikation und linguistische Ressourcen, Sprache, Sprechen und Computer, Bd.8, Peter Lang, Frankfurt am Main, pp.497-512.
- Delmonte R. 2003. Parsing Spontaneous Speech, in Proc. EUROSPEECH2003, Pallotta Vincenzo, Popescu-Belis Andrei, Rajman Martin "Robust Methods in Processing of Natural Language Dialogues", Genève, pp, 16-23.
- Ford, C.E. and Thompson, S.A. 1996. Interactional units in conversation: syntactic, intonational, and pragmatic resources for the management of turns. In E. Ochs, E.A. Schegloff & S.A. Thompson (eds) *Interaction and grammar*, Cambridge: Cambridge University Press, pp. 134-184.
- Sacks, Harvey, Emanuel Schegloff & Gail Jefferson. 1974. 'A simplest systematics for the organization of turn-taking for conversation,' *Language* 50(4), 696-735.
- Schegloff, Emanuel. 1996. 'Turn organization: one intersection of grammar and interaction,' in Ochs, Schegloff, & Thompson (eds.), *Interaction and grammar*, Cambridge University Press, Cambridge, pp. 52-133.
- Shriberg, E.; A. Stolcke, and D. Baron. Observations on overlap: Findings and implications for automatic processing of multi-party conversation. In P. Dalsgaard, B. Lindberg, H. Benner, and Z. Tan, editors, *Proc. EUROSPEECH*, vol. 2, pp. 1359-1362, Aalborg, Denmark, 2001.