

## TWO RELEVANT PROSODIC CUES IN SPONTANEOUS SPEECH

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**Abstract:** This research is concerned with fluency and speech rate since they result interesting in the characterization of speech as well as of the speaker. We have examined two types of Italian political spoken messages i. e. interviews given before (IPE) and after (ISE) the political elections of 1996. Our data show that fluency and speech rate significantly change because of the type of speech situation. Fluency is higher in ISE than in IPE and it seems reasonable to assume that such a difference is mainly due to the different psychological situation of the speaker. Emphasis, control level and programming ability seem to be closely linked to fluency variations. Data referring to speech rate seem to discriminate government speech from opposition speech.

**Keywords:** fluency, pauses, speech rate, political speech.

### 1. INTRODUCTION

Pauses are, as everybody knows, a very useful clue to understand better the message the speaker wants to convey. Syntactic pauses are crucial for a correct comprehension of the meaning; emphatic pauses give to a monochrome speaking a large variety of semantic nuances; pauses differently distributed along the speech chain give rise to very different kinds of messages; finally, longer or shorter pauses tell us a lot about what the speaker intends to say. So, no doubt about the importance of pauses in transmitting data to the listener. Not so evident is the fact that pauses contain information also about what the speaker wants to hide from the listener. In fact pauses can also be the evidence of a masking processus operated by the speaker in order to differentiate the real speech from its mental image. A good example of this aspect of the question

is given by the results of a research we made on the speech of Italian political men. The research was first developed by Savastano, *et al.* (1995), and later expanded by Pettorino, *et al.* (1996), and Pettorino (1997).

## 2. METHOD

In 1992 and 1996, during Italian political elections, we have recorded pieces of speech produced by political leaders of different parties both during the election campaign and immediately after the vote: from now on we'll call the former IPE (Interviews Preceding Election) and the latter IFE (Interviews Following Election). A total of about 8500 syllables uttered by 12 speakers have been analyzed with a DSP KAY Sonagraph. First of all we counted the syllables of each speech chain, that is the portion of speech included between a silent pause and the following one. The duration of each chain and of each pause has been measured and the average values have been calculated. Then, in order to compare the different speeches on the prosodic level, the following parameters have been obtained: fluency, that is the ratio between the number of uttered syllables and the number of silent pauses; speech rate, that is the ratio between the number of syllables and the duration of the whole speech; articulation rate, that is the ratio between the number of syllables and the duration of the time required to utter them, so excluding the silent pauses.

We obtained the average values for each parameter and for each situation, that is IPE or IFE (TAB. I). As we can see, the only parameter changing considerably is the one concerning fluency: from IPE to IFE there is an increase of about 23%. So, we have tried to explain this anomalous trend of fluency and that's why we have considered all the factors that can determine a fluency change.

## 3. DISCUSSION

Fluency is proportional to the speaker's capacity of programming on line his speech and this is not an easy task, if we consider all the mechanisms entering in action during phonation. When the capacity is inadequate, then silent pauses arise inside the sentence to give time to the speaker to reset the two levels, the mental and the articulatory one. However, being an absolutely individual factor, the capacity of programming cannot account for a general trend as it could have nothing to do with the fact that the same speaker, having a certain level of capacity, decides to increase his fluency after the electoral event.

Fluency is inversely proportional to the level of emphasis: the more the speaker wants to stress a single word inside the sentence, the more his talking will be characterized by the presence of silent pauses. The most common and easy way to emphasize a portion of speech is to place it between two silences, as in a frame of attention: the first silence produces in the listener the expectation of what is coming, the second silence gives him enough time to think about what has just been said. However, to be efficient, this strategy needs pauses which are longer than

Table I. Average values for each parameter and for each situation.

Rhythmical factors	IPE	IFE
Fluency	16.25	20
Speech Rate	4.50	4.70
Articulation Rate	5.50	5.70
Silence Time (%)	17	16
Pause Duration (ms)	550	590
Syllable Duration (ms)	175	173

respiratory ones, so that they can unequivocally be perceived as signals of attention. Now, what happens in our political speeches is quite different: the low fluency in the IPE corresponds to shorter pauses rather than to longer ones (550 ms - 590 ms). So, emphasis cannot explain the different fluency between IPE and IFE.

A further element able to produce fluency variations is given by the dominating/dominated situation, terminology introduced by Duez (1991). In a dominating speech, fluency is quite low because the speaker's aim is not to say 'things', but just to convey to the listener a sensation of authority. So, pauses become frequent and rather long; in fact the more the speaker appears authoritative, the less the listener can profit by the silence to start speaking: omnipotence needs absolute silence. In a dominated situation speech is very different: the speaker tries to make the most of his time, fluency increases, silences are short and rare. When his speech is finished, he seems to have still many things to say. However the different relation with the power can explain fluency variations between different speakers, but cannot explain the fact that the same speaker changes his fluency before and after the election. So, only one element can be considered, that is the degree of control that the speaker exerts on his speech.

This control occurs after the speech has been programmed but before it is sent to the articulators to be realized. It consists of a question the speaker asks himself, that is "Shall I say it or not?" The more the speaker is worried about something, in our case the result of elections, the more such a question is frequent. In other words, he does not say what he really thinks. In fact, if the answer to the question is "No, because it is not profitable in order to collect votes", the programmed speech is not sent to the articulators and a new sentence must be quickly prepared. This requires a moment of meditation and so the silent pause arises.

That's why in the IPE the fluency is lower than in the IFE, where the speaker loses the control and his speech becomes more spontaneous.

This is confirmed by the data related to the duration of pauses and to the percentage of silence. In fact although in the IFE pauses are longer, on the whole the percentage of silence is lower: evidently pauses after the election are quite rare and this is determined by a greater coefficient of spontaneity of the speaker.

in conclusion, we can say that, the variations of fluency and of the duration of the silent pauses are two very useful clues in order to value the degree of spontaneity and, to a certain extent, of sincerity of the speaker.

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