

INTENTIONALITY IN THE SPEECH ACT AND REDUCTION PHENOMENA

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ABSTRACT

The present study focus on the influence of intentionality of the speech act in the characterisation of speaking styles. Two procedures to elicitate spontaneous speech in a laboratory environment are presented: the map task and a semidirected interview, both performed with the same speaker. Differences in elicitation procedures are interpreted in basis of the intentionality of the speech act. Related to this, phonetic behaviour of vocalic groups in Spanish for a given speaker is observed. Results show that speech obtained by means of the described procedures is spontaneous, even when intentionality in the speech act appears.

1. INTRODUCTION

It is well known that in all languages speakers have some pronunciation, lexical or grammatical choices which are not a matter of the basic structure of the language but a matter of style; moreover, they have an implicit knowledge of the appropriateness of the speaking style they are using with respect to the situation where they are. Nevertheless, variations are presented in a continuum scale and the factors shaping a given speaking style can have a linguistic, sociolinguistic or pragmatic nature [1, 2].

In this study, we focus on the importance of intentionality of the speech act in the characterisation of speaking styles: Searle [3] uses the structure of the speech acts as a heuristic guide in order to elucidate the structure of intentional states.

Two procedures to elicitate spontaneous speech in a laboratory environment are presented: the map task and a semidirected interview, both performed with a same speaker. Differences in elicitation procedures are interpreted in basis of the nature of the speech act. An overt intentionality in the speech act exists in the map task: both

speaker and listener are involved in the task and they want to achieve the objective with the maximum success. The semidirected interview, on the contrary, lacks of intentionality: there is not an explicit purpose to reach.

The manifestation of vocalic reduction phenomena in Spanish is taken as the index of study to determine if the presence of intentionality affects the speech in a sense of more carefulness and in a loss of naturalness. From an experimental point of view, the main interest consists in determining if the described procedures are suitable to obtain spontaneous speech.

2. EXPERIMENTAL PROCEDURE

2.1. Speech Situations

In order to study the influence of the intentionality of the speech act in the phonetic manifestation of vocalic sequences, two types of corpus have been used: the model of HCRC Map Task Corpus [4, 5] and the model of semidirected interviews.

Elicitation procedures are different, but some variables are controlled: the participants are the same, they maintain a familiarity relation and they have comparable speech rates.

The aim is to compare different speaking styles with the same linguistic content for a given speaker.

2.1.1. Map Task

The map task follows the model in which two actors inhabiting a simple micro-world cooperate to get practical goals: in this case, the completion of a route designed in one actor's map but inexistent in the other actor's map. In the course of the task, conversation arises.

The collection of the corpus by means of the map task allows to consider the degree in which a communicative act characterised by an overt intentionality and requiring cooperation, affects the

language use: there is a clear objective, which must be reached and can be only achieved by means of the verbal interaction of the speakers.

2.1.2. Semidirected interview

In the semi-directed interview, the roles of the interviewer and the interviewee are previously determined, although both participants are familiar.

The interviewer proposes the subjects of conversation which change depending on the interest of the speakers; both interviewer and interviewee participate actively in the conversation so it is far from being a monolog.

2.2. Recordings

Samples of the speech of a male speaker aged 25, with high-level studies, were collected from both situations.

The recordings have been done in a sound-treated room in the Autonomous University of Barcelona. The recordings for each speech situation takes approximately an hour and a half.

2.3. Corpus

In Spanish, the difference between vocalic groups in hiatus -vowel+vowel sequences- and diphthongs -glide+vowel and vowel+glide sequences- is an important idiosyncrasy of the language: the fact that a sequence can be realised as a hiatus or must be pronounced as a diphthong is a lexical property of the words, and speakers have strong intuitions concerning the pronunciation in hiatus or in diphthong of the vocalic sequences. In spontaneous speech, a continuum of reduction going from hiatus to diphthong to vowel can be described [6].

In this study, the following vocalic combinations are observed: hiatuses ['ia], ['io]; diphthongs [ja], [jo]. The vowels [a, o], acoustically distant from [i], have been chosen in order to determine easily the reduction to a diphthong or to a vowel.

2.4. Procedure analysis

The traditional nondynamic procedure of acoustic analysis of diphthongs and hiatus consisting in the segmentation of the sequence in three areas corresponding to an initial segment, a transition and a final segment [7, 8] has been adopted

here. If transition can not be observed, the sequence is segmented in the initial segment and the final segment.

As for the analysed parameters, in the temporal domain global duration and duration of the initial segment, the transition (if possible) and the final segment have been considered; in the frequential domain, the first two formant frequencies in the centre of the initial segment, the initial boundary of the transition, the final boundary of the transition (when existing) and the centre of the final segment are observed. Data have been obtained by means of the MacSpeech Lab II speech analysis software.

3. RESULTS

Results are organised around two questions: the manifestation of phonetic reduction processes related to vocalic sequences, and the acoustic cues that differentiate hiatuses, diphthongs and vowels in each of the observed speech situations. We have considered hiatus when two segments appear clearly, diphthongs when a transition existed from one segment to the other, and vowels when only one segment can be observed.

3.1. Phonetic reduction processes

Concerning vocalic groups in Spanish three types of processes can be observed:

a) strengthening, where a diphthong is realised as a hiatus;

b) maintenance, where the vocalic group doesn't change its phonetic quality;

c) weakening, which can show a three-fold result: a diphthongisation, where a hiatus is pronounced as a diphthong; a vocalic deletion in a hiatus; or a vocalisation of a diphthong, manifested as a fusion in an intermediate element, sharing properties of the original segments of the group, or as a deletion of one of the segments.

Figure 1 shows in percentages the phonetic results of the hiatus and diphthongs in the map task and in the semidirected interviews.

Cases of strengthening have been found only in the speech excerpted from the semidirected interviews (10.26%), mainly due to the presence of emphasis. On the contrary, the processes of

weakening are present in both types of corpus, referred to hiatuses and to diphthongs: in the semidirected interviews, the 27% of hiatus is pronounced as a diphthong and 12.1% as a vowel, whereas in the map task corpus, any case of diphthongisation is found but a 33.33% of vowel reduction; concerning the acoustic manifestation of diphthongs, 59.09% is reduced to a vowel in the map task corpus and 43.59% in the semidirected interviews.

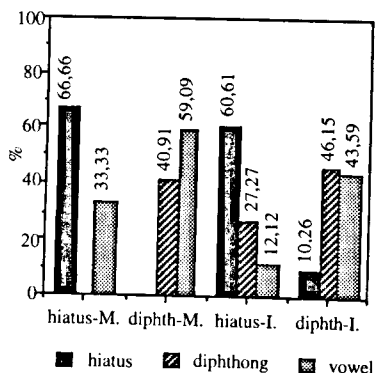


Fig. 1. Percentages of the phonetic results of the hiatuses and diphthongs in the map task (M) and in the semidirected interview (I).

If we pooled data referred to vocalic sequences, we found 44% of maintenance cases and 56% of weakening cases in the corpus of map task; in the semidirected interview, 52.7% of maintenance cases, 41.6% of weakening cases and 5.55% of strengthening cases are obtained.

3.2. Acoustic Parameters

Hiatuses, diphthongs and vowels, the three acoustic manifestations which are the result of the vocalic sequences

analysed, can be differentiated in basis of the total duration, and the duration and the second formant frequency of the first segment.

The number of cases (n), mean values (x) and standard deviation (sd) of these parameters can be observed in table I. A hiatus is always longer than a diphthong in the two type of corpus, and both are longer than the vowel, fact that could favour the bivocalic nature of a diphthong; with respect to the frequency, the first element of a hiatus shows a higher value of F2 than the first element of a diphthong in the semidirected interview corpus, but in the map task the relation is inverse: the initial element of the diphthong presents a higher value than the initial element of the hiatus. The consonantic context, in most of cases of the map task, a vibrant, could explain this fact.

An ANOVA analysis shows that the differences between the global duration of the sequence, the duration and the F2 frequency of the first element are significative at a 5% level of significance.

If we focus on the source of precedence of diphthongs, a difference between hiatus becoming diphthongs (weakening cases) and those diphthongs which come from diphthongs (maintenance cases) can be noted: the F2 frequency of [i] is higher in diphthongs coming from a hiatus than in diphthongs which have not suffered a change: 2067 Hz. and 1754 Hz respectively.

Finally, as far as interstyle differences is concerned, any important difference have been found. An ANOVA analysis applied to the global duration of hiatus, diphthongs and vowel in each type of corpus, and to the duration and F2 of the first element in hiatus and in diphthongs have not shown significative differences at a level of 5% in any case.

Table I. Number of cases (n), mean values (x) and standard deviation (sd) of the global duration of hiatus and diphthongs, the duration and the F2 frequency of the first element of hiatus, and diphthongs, and the duration and the F2 frequency of the vowel in the map task corpus and in the semidirected interview.

| | | Total dur. | | | Dur initial segment | | F2 initial segment | | |
|---|-----|------------|-----|----|---------------------|----|--------------------|------|------|
| | | H | D | V | H | D | H | D | V |
| M | n | 2 | 9 | 14 | 2 | 9 | 2 | 9 | 14 |
| a | x | 137 | 104 | 68 | 69 | 47 | 1842 | 1997 | 1729 |
| p | sd. | 31 | 33 | 16 | 21 | 7 | 432 | 90 | 258 |
| I | n | 24 | 25 | 21 | 24 | 25 | 24 | 25 | 21 |
| n | x | 144 | 88 | 58 | 69 | 48 | 2134 | 1993 | 1813 |
| t | sd. | 38 | 26 | 19 | 19 | 13 | 200 | 139 | 225 |

4. CONCLUSIONS

The comparison of the acoustic manifestations of vocalic sequences in speech obtained in two types of corpus, which are differentiated by the presence of intentionality, shows two main trends.

On one hand, phonetic reduction processes appear in both types of speech, pointing out the tendency to hypoarticulation, characteristic of relaxed speech styles. The presence of strengthening processes in the semidirected interview is related to the presence of emphasis.

On the other hand, acoustic cues between vowels, diphthongs and hiatus are the same in both types of speech: duration and F2 frequency [6, 8, 9].

It can be said that the strategies described in this study are suitable to elicitate spontaneous speech: the presence of intentionality, in the map task corpus, can not be directly related to the presence of a higher degree of carefulness -by contrast, these fact depends on emphasis.

On the other hand, naturalness is not affected, as it is shown by the presence of phonetic reduction phenomena: this fact can be explained by the behaviour of the speaker involved in the map task. The implication in the task shifts the speaker's attention over his language, and an unconstrained speech is obtained.

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