1. Introduction

Speech is performed with the intention of communicating a certain set of meanings to the listener. To be able to convey this message, the speaker uses, besides the words themselves, some vocal strategies (i.e., timing, loudness) in order to transmit certain intentions. These prosodic signals are often used to accent the verbal message by adding emphasis to particular words, phrases, or sentences. The importance of prosody in determining the speaker's intent has often been assumed, but with little actual research. Although attempts to analyze the ways used for emphasizing words in a sentence have been undertaken, and methods for accenting a sentence are known and used in speech delivery, there is little physical analysis and measurement of the factors contributing to the accenting of a sentence in context. In light of this, the present study aimed at investigating the vocal strategies used by speakers to emphasize a certain part of speech, when trying to communicate to the listeners that this part is the most important in the context. As the communicative potential of nonverbal behaviour is heavily influenced by culture, and the specific nonverbal messages vary significantly within different languages, this topic was approached from a cross-cultural point of view, analyzing the pattern of intention communication in languages belonging to different linguistic groups (Romanian, English, Japanese). This study focuses on the analysis of pauses in particular, and additionally on vocal intensity and speech rate.

2. Experiment 1 (Japanese), Experiment 2 (Romanian), Experiment 3 (English) - Vocal strategies in expressing 'importance'

Purpose and Method

These experiments investigated the vocal strategies used by speakers of three languages (Japanese, Romanian, English) for accenting a certain part of the speech. The speakers read aloud two texts in their native languages (respectively Japanese, Romanian and English), firstly with no particular instructions (control condition) and secondly, such that they communicate to the listener that one of the sentences (chosen by the

experimenter) was the most important in the context (communication of intention condition). Their speeches were acoustically analysed.

Results and Discussion

When trying to communicate that a certain segment of speech is more important than the rest, the speakers took longer pauses before and after the emphasized (important) sentence, and uttered this sentence at a slower rate. Moreover, the important sentence was louder than the other, non-important, sentences, and the variations in intensity were bigger for the emphasized sentence.

In Japanese, the pausing behaviour was found to be heavily employed in the communication of intention, long pauses being taken before, and especially after the important sentences. In Romanian, the absolute duration of the pauses was much smaller than in Japanese, but the changes in the pause durations for the important sentences relative to the non-important sentences were higher in Romanian for the preceding pauses. In English, the pauses were shorter than in Japanese but longer than in Romanian; however, the 'importance' communication had no significant effect on the duration of the preceding pauses, whilst the post-target pauses increased considerably, at about the same rate as for Romanian.

3. Experiment 4 – Detection of intention in speech

Purpose and Method

This experiment aimed at evaluating the extent to which the intention of the speakers is detected by listeners via acoustic correlates of speech. The speeches were presented in both Japanese (as native language) and Romanian (as unfamiliar language). The goal of the unfamiliar language study was to investigate if it is possible to communicate a certain intention only acoustically, independent of linguistic meaning.

Results and Discussion

In a native language, the intention of the speaker was successfully communicated to the listeners, most of them choosing the sentence emphasized by the speaker as the most important in the context. The detection of the target sentence was influenced by speech

rate (the slower the rate of a sentence, the more the subjects chose it as the target sentence), duration of the pauses following the sentence (the longer the pause, the more important the sentence was considered to be), and vocal intensity (the higher the level, the more the subjects chose it as the target sentence).

Even in an unfamiliar language, the intention of the speaker was fairly well detected, information being extracted only from the acoustic factors used by the speaker.

In this case the choices of the listeners were possibly influenced by acoustic cues such as the pauses preceding the sentence, and the vocal intensity across the target sentence.

4. General Discussion

This study has shown that prosodic factors such as pauses, speech rate and vocal intensity are heavily employed in the communication of important information in speech for all the three languages belonging to different linguistic groups: Japanese, Romanian and English. Native speakers of these languages use similar strategies in expressing ‘importance’, combining the three acoustic correlates analysed, for more effective intention communication. However, the degree to which each of the acoustic factors contributes to the communication of intention in each language and their combination in accenting a part of the speech are different for the three languages. Especially the pause taking behaviour differs considerably. In Japanese, as well as in English, the pauses taken after the target sentences appear to play a more significant role in intention communication, while in Romanian, the preceding pauses are employed more for adding emphasis.

Additionally, the results suggest that, even if they may be insufficient when semantic information is not available (as in an unfamiliar language), the acoustical cues play a very important role in understanding a certain intention.

In the future, it is necessary to investigate the effect of emphasis at the word level, and also to test how the manipulation of prosodic cues (especially pausing) influences the listener’s understanding of the speaker’s intended message.