

The Information Value of Some Hesitation Phenomena: Filled Pauses, Lengthenings, and Entropy Reduction

There has been a resurgence in psycholinguistic research on such hesitation markers as filled pauses (FPs: *uh*, *um*) in the last decade with the understanding that these markers are overt markers of speech repair processes (cf., Levelt, 1983). Consistent with this, Clark and Fox Tree (2002) argue that FPs serve a pragmatic role as giving an account of an impending delay in communication on the part of the speaker. Although less studied than FPs, lengthenings (e.g., *a:nd*, *we:ll*) are arguably similar. In short, then, these hesitation markers constitute information from which listeners make inferences. The present research reports on an effort to use Information Theory (Shannon, 1948) and particularly the concept of entropy reduction in a corpus analysis to investigate the relationship between hesitation markers and subsequent delay (i.e., pauses) in spontaneous speech.

A given probability space has a certain entropy which is based on the number of outcomes and the relative likelihood of those outcomes—the more balanced the probability of the outcomes, the higher the entropy. Learning some information may cause the relative likelihood of outcomes to change, resulting in a change in the entropy of the probability space. Information theory gives a useful way of quantifying the value of this information (called *estimated information value* or EIV) based on how much entropy reduction is obtained by learning that information. In spontaneous speech, there is a lot of information being communicated from the speaker to the hearer. The present study focuses on the information about what kind of hesitation marker is being used—open FPs (*uh*), closed FPs (*um*), or lengthenings (*we:ll*, etc.)—and how that relates to the probability of a certain outcome—whether or not the speaker will delay by pausing.

The study uses a small, specialized corpus of spontaneous speech which consists of 8,200 spoken words from four different native speakers of English. Various hesitation phenomena have been marked for type of vocalized hesitation (FPs, lengthenings, as well as false starts, restarts, and repeats) and length of silent pause (short, normal, long).

One key result of the corpus analysis is that the information value of closed FPs (EIV=0.0103) is much higher than that of open FPs (EIV=0.0005) with respect to the question of how likely the speaker is to pause immediately thereafter. In other words, learning whether or not a hesitation marker is a closed FP is much more informative than learning whether or not it is an open FP. This result is consistent with and replicates previous work (Clark and Fox Tree, 2002). Furthermore, lengthenings are just as informative (EIV=0.0102) as closed FPs, providing evidence that lengthenings and FPs are closely related phenomena.

Other results based on information theory will be given in this poster to paint a clearer picture of FPs, lengthenings, and related hesitation phenomena.

References

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