

1. SUMMARY OF PROPOSED RESEARCH

This research addresses the contribution of prosodic features to the interpretation of utterances. While there has been much progress in describing phonetic and phonological aspects of prosody, there has been less research into semantic and pragmatic interpretations. There have been even fewer corpus studies of meaning and prosody in natural, interactive speech (Hirschberg 2004). Our goal is to conduct a series of mid-scale corpus studies of North American English, investigating how the prosodic system expresses meanings relating to sentence types and information structure. We will annotate a corpus of cooperative telephone conversations and a corpus of argumentative television discussions for phonology and meaning and examine the relation between these levels of analysis. We will also supplement the corpus studies with a series of laboratory perception experiments to further test some of our conclusions.

Sentence type involves the distinction between declarative and interrogative sentences, and these can be positive or negative in polarity. Different sentence types are prototypically used to express certain speech acts (e.g., assertions, questions, and contradictions) and have prototypical prosodic shapes. In actual discourse, however, all of these sentence types can have a final rise or fall in pitch, as well as having certain pre-final prosodic configurations. Through a series of corpus and experimental studies, we will evaluate theories that rely on linguistic intuitions in explaining the differences in meaning between the different intonation patterns and different declarative and interrogative forms. Due to its precision, we will adopt interactive dynamic semantics as our semantic/pragmatic model. The theory is dynamic in that it explicates the way that a given utterance is interpreted relative to the already established context and then serves to change that context. It is interactive in that the changing information states of both speaker and hearer are modeled.

Information structure involves aspects of meaning such as topic, focus, contrast and givenness. We will integrate existing theories of these components of information structure and their prosodic correlates, and evaluate resulting hypotheses about the information structure of different declarative and interrogative forms against natural speech corpora. According to our theory, the topic links an utterance to its context, and the prosodically prominent comment or 'focus' expresses the information about the topic that is conveyed by the utterance. Contrastive and less given expressions are also associated with a greater degree of prosodic prominence. Particular pitch patterns as well as accent placements will be examined in disentangling the prosodic correlates of different information structure categories.

For the phonological/phonetic coding, we will use an enriched version of the standard, autosegmental-metrical system for transcribing the prosody of North American English, ToBI (Beckman & Ayers-Elam 1997).

Through previous pilot studies, we have identified four hypotheses to test further, both in extended corpus studies and perception experiments. These hypotheses are that high-rise yes-no questions (H*H-H%) are associated with a 'reminder' meaning, as opposed to the possibility of an 'out-of-the-blue' meaning associated with unmarked low-rise (L*H-H%) questions; that falling yes-no questions are perceived as 'non-genuine' questions; that a distinctive low-rise contour (L*L-H%) marks contradictions; and that a particular rising pitch accent (L+H*) marks 'contrast' instead of 'topic'. However, our corpus studies will not be limited to the study of these four hypotheses.

Our investigation of the prosody of sentence types and information structure has significant potential for improving computational speech generation and analysis technology, primarily because we are exploring the meaning of prosody in real speech. It will also have applications in English as a Second Language instruction. The contribution of our research in both domains will be to clarify the relevance of prosody in discourse, by defining the role of accent placement, phrasing, and type of intonation contour in the meaning and appropriateness of utterances in spoken communication.