SOME WAYS IN WHICH FORMS ARISE FROM FUNCTIONS IN LINGUISTIC COMMUNICATIONS

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ABSTRACT

We are examining some ways in which talkers signal discourse structure to listeners. Earlier research had suggested that words are shortened in acoustic duration the more redundant they are, and other findings suggested that the lexical length of referring expressions varies as a function of their role in spoken discourse. Comparing across the lines of research, we have speculated that the two levels of shortening may occur in response to variation in some of the same discourse variables. The research on which will report offers supportive evidence for the variable, order of mention in an episode unit.

1. INTRODUCTION

Some language forms arise from language use. More or less as the character of a riverbed reflects the dynamical forces that have formed it or as a fossil tooth reflects the dietary habits of a former chewer, some common phonological and lexical forms of languages may reflect the constraints on talkers and listeners that have given rise to them.

Some constraints are articulatory and perceptual. In particular, the literature provides evidence of striking parallels between certain phonological systematicities of a few languages and phonetic regularities that are universal or nearly so. The parallels have been taken to suggest that the phonological forms arose as elevations from, and conventionalizations of, articulatory dispositions of the vocal tract [12] triggered, perhaps, by systematic misperceptions of members of a language community [13]. Some parallels, among others, are the following. In nearly all languages that have been examined, final voiced obstruents are partially devoiced, while in some languages, a phonological voicing distinction among obstruents is neutralized word finally. In many languages, vowels are shortened in measured acoustic duration as consonants are added to the syllable rhyme, while in some languages, phonologically long vowels can only occur in open syllables or followed by at most one short consonant. Historically, loss of a consonant in the rhyme of a syllable has occasionally triggered phonological lengthening of a preceding vowel. In many languages, intonation contours exhibit downdrift or declination, which tracks the falling subglottal pressure of the lungs [6], while some languages have intonational downstep rules, and some tone languages have downstepping lexical tones.

Articulatory dispositions and mishearings do not, of course, exhaust the communicative constraints that may shape language forms. In our presentation, we will examine effects of two additional hypothetical constraints: speaker

efficiency and comprehensibility of the linguistic message. As for the articulatory and perceptual constraints, these superordinate constraints may give rise to parallel regularities at distinct linguistic levels--in this case, lexical/syntactic and prosodic/phonetic. In contrast to the phonological and phonetic correspondences described above, in the case of these additional parallels, we do not identify a directional arrow--that is, an indication that features at one linguistic level derive from those at another. Rather, we speculate that the same communicative pressures may exert themselves concurrently at several levels of linguistic structure and may leave parallel traces behind. The features on which we report are a durational shortening (or lengthening) of words that are less (more) expected by the listener and a lexical shortening of referring terms under approximately the same conditions.

As for the phonetic effects, Bolinger [2,3] suggests that words that are unexpected in their contexts (e.g. "mowed" in "he mowed home") are lengthened in duration as compared to their duration in contexts where they are expected ("he mowed the grass"). Perhaps compatibly, Lieberman [11] has found that spoken words excised from contexts in which they are predictable are less identifiable than the same words excised from contexts in which they are unpredictable. Even out of context, spoken words that are chronically likely to be produced (that is, high frequency words of a language) are shorter in duration than unlikely words (e.g. [15]); this holds even for more and less frequent nonhomographic homophones [14].

Similar effects are found in spontaneous speech [5] and, to a lesser extent, in read discourse [4]. Words produced for the first time are durationally longer than the same words repeated (as long as they have the same referent on both occasions; see [1]). On the listeners' side, second occurrences of words are generally more predictable from their contexts than are first occurrences, and there is some evidence [5] (but see [1]) that the durational reduction itself has communicative significance to listeners.

These effects may indicate at least that speakers reduce words when they know that the listener can get by with a less adequate acoustic signal, because the context predicts the word. In addition, however, if the findings on listeners' perceptions are real, they may show that listeners use durational reduction as information that a word is "old" and hence refers back to material earlier in the discourse. In turn, information that a word is old may facilitate retrieval of relevant earlier material.

Turning to the findings of lexical shortening, when terms for new referents are coined, their names often are long, and their meanings are sometimes decipherable from their component morphemes ("automobile", "videocassette recorder"). When real-world referents of these new terms are talked about frequently and become commonplace, their names often shrink and become less transparent ("car"; "VCR"; cf [16]). Thus, there is a wearing away of terms with use that is reflected also in the finding that high frequency words of a language are shorter than low frequency words [16] (see also [8]).

On a shorter time scale, in spoken discourse, a similar phenomenon can be observed. Givon [7] suggests a principle whereby less predictable or less accessible topics in a discourse tend to be coded using more

linguistic material than is used to code more predictable and accessible topics. In particular, in an analysis of referring terms, he suggests that referring terms vary in length depending on predictability and accessibility along the following continuum (abbreviated slightly here) from least to most accessible: modified full NPs, full NPs, stressed pronouns, unstressed pronouns, zero anaphor.

Compatibly, in an analysis of the spontaneous narrations of four speakers (who recounted a film that they had seen to naive listeners), Levy [9,10] found a strong relation between the length of referring terms (references to either of two male characters in the film) and two measures of accessibility of the referents to the listener. In particular, referring expressions were longer when the immediate context of the targeted expression was "noncoreferential" than when it was coreferential. (A coreferential context is one in which the last male reference to occur in a parallel position to the target reference is coreferential with it.) In addition, longer expressions occurred in "sparse" rather than "dense" contexts (where a dense context referred to an immediately preceding paragraph in the discourse in which the targeted character was more frequently mentioned than were other characters). Interestingly, Levy identified another variable that was associated with the length of a referring expression that is particularly analogous to findings of Fowler and Housum [5]. She found that longer referring expressions were used to refer to a character's first, as compared to subsequent, mentions in an episode unit of the discourse.

2. OUR ONGOING RESEARCH

The research on which we will report examines the relation, if any, between the two levels of length variation that we have described. In particular, we are examining the acoustic durations of full NP expressions referring to the two main characters in the film narrations collected by Levy [9].We know from that earlier study that referring expressions in these narrations exhibit lexical length variation in response to the three discourse variables: coreferentiality and density of prior mention and order of mention in an episode unit. In the narratives of four of the eight speakers that we have examined to date, we find consistent effects of order of mention in a episode within the narratives such that first mentions of full NPs in an episode are durationally longer than subsequent mentions, even when the character has been mentioned previously in the narrative. For one main character, across the four talkers, first-mentioned full NPs are 42 ms longer than subsequent mentions on average ($F(1,149) = 3.88$, $p = .05$). For the other main character, first mentions are longer by 107 ms on average than subsequent mentions ($F(1,121) = 9.56$, $p = .0025$). We have also looked for effects of the discourse variables, coreferentiality of prior mention and density of prior mention, but, in the two speakers in whom we have examined the data, these variables do not affect acoustic duration of referring expressions in a consistent way.

We speculate that the systematic variation that the literature reveals and that we have found in the phonetic durations of expressions and in their lexical length, may originate in a sort of tradeoff between a talker's goal of verbal efficiency and the requirement that listeners be able to recover the intended communicative message. As a communication goes forward,

some topics arise temporarily as central and hence as accessible to and predictable by the listener, while other topics are less central, accessible and predictable. Compatible with a goal of efficiency, speakers will shorten, in either or both of two ways, terms relating to the accessible, predictable topics. The pattern of shortenings and lengthenings themselves may be informative to listeners, however, who then can use evidence of durational reduction or that a referring term is inexplicit as information that a referent is "old" and can determine from the fact that a referring term is inexplicit that the referent is viewed by the speaker as focal to a topic.

3. REFERENCES

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