

# THE EFFECT OF ADDRESSEE FAMILIARITY ON WORD DURATION

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## ABSTRACT

This paper describes an experiment which was designed to test the hypothesis that speakers alter the forms of words in response to the degree of familiarity of their interlocutor: specifically, that words addressed to a hearer whom the speaker knows well are shorter than the same words addressed to a hearer whom the speaker has not previously met. Six of the eight speakers examined exhibited the predicted effect in both read and spontaneous speech modes.

## 1. INTRODUCTION

Many factors affect the durations of spoken words. While some of these relate to the word's position in the immediate context of the utterance in which it occurs (for example, its proximity to syntactic boundaries or pauses [1]), others have to do with its wider linguistic and paralinguistic context, and in particular with the extent to which speaker and hearer share knowledge and assumptions: for example, a word's duration is inversely related to its predictability [2,3]; words are longer when they are initially introduced into a discourse than on subsequent mention [4,5,6]; words are longer when they occur in spontaneous discourse than when they are produced by the same speaker reading back a transcript of the same discourse [5]. The experiment described in this paper was designed to investigate the effect of a further variable in this latter group: the degree of familiarity between two interlocutors engaged in a cooperative task.

The starting point of this study was the hypothesis that word durations would be shorter when the two interlocutors knew

each other well than when the task involved two speakers who had never previously met. It seems likely that familiar speakers will respond to their hearers' ability to use knowledge about what they say and how they say it, and shorten words, in much the same way as they might exploit the redundancy in utterances like *A stitch in time saves nine* to shorten the final word [2].

It has indeed frequently been claimed that speakers alter their speech and language in response to their degree of familiarity with the hearer [e.g. 7]. Indirect experimental support for the hypothesis comes from more than one source. One type of evidence is found in the literature on the processing of spontaneous speech (see, for example, [5, 8, 9, 10]). In such studies, the spontaneous speech samples have generally been elicited by having the subject(s) converse with the experimenter or some other person whom they have never previously met. However, the pairs of speakers who produced the spontaneous speech in McAllister's study [8] were close friends (and thus highly familiar with each other's speech habits). In common with other researchers who have studied intelligibility in spontaneous speech, McAllister found that intelligibility was mediated by word duration; however, the level of intelligibility of content words in her spontaneous speech samples was markedly lower than that in other studies of spontaneous speech. McAllister suggested that the degree of familiarity of the interlocutors in her materials may have affected the duration, and thereby the intelligibility, of the words she examined.

Further indirect evidence for the influence of addressee familiarity on the forms of spoken words comes from the

experimental literature on motherese, the specialised register addressed to children. Shockey and Bond [11] found that phonological rules such as palatalisation operated more often in mothers' speech to their children than in their speech to an adult visitor. In their experiment addressee age was confounded with addressee familiarity: the mothers who took part in the study spoke to their own children and to another adult whom they presumably knew less well. This suggestion is in keeping with Shockey and Bond's own proposal that the effect they observed was attributable to the mothers' wish to set a tone of intimacy in their dialogues with their own children. Although the dependent variable studied by Shockey and Bond was phonological rule application rather than word duration, it is not implausible that the two variables might be subject to similar influences, and indeed a further study of motherese [12], in which addressee age and familiarity were similarly confounded, revealed that words addressed to children were shorter (as well as less intelligible) than those addressed to adults.<sup>3</sup>

## 2. METHOD

The spontaneous speech samples which were used in the current study were collected using the so-called map task [13], which involves pairs of speakers, each of whom has a map. One speaker, the Instruction Giver, has a route marked on his or her map, while the other, the Instruction Follower, has no route. The speakers are told that their goal is to reproduce the Instruction Giver's route on the Instruction Follower's map. Neither speaker can see the other's map, and in the version of the task described in this paper, the speakers were prevented from seeing each other by the presence of a screen. The maps are not identical in every respect<sup>1</sup> and speakers are told this explicitly at the beginning of their first session. It is, however, up to the speakers to discover exactly how the two maps differ; they are encouraged to ask as many questions as necessary in order to achieve their goal. The task has been used extensively to study speakers' discourse strategies and is considered by experimenters and subjects alike to elicit highly natural spontaneous speech.

The eight subjects who volunteered to take part in the experiment were grouped into two 'quadruples'. Each quadruple

contained two pairs of speakers. The members of a pair knew each other well but had never before met the members of the other pair in their quadruple. Each subject participated in four map conversations: once as Instruction Giver with the other member of their pair, once as Instruction Follower with the other member of their pair, once as Instruction Giver with a member of the other pair in their quadruple, and once as Instruction Follower with the same member of the other pair in their quadruple. Each speaker thus participated in two sessions in the Familiar condition (in which they knew their task partner well) and in two sessions in the Unfamiliar condition (in which they were partnered with a subject whom they had never met prior to the experiment).

Each of the sixteen spontaneous conversations which resulted from these pairings was orthographically transcribed by one experimenter and the transcription checked by another. The eight subjects were then asked to return to the recording studio and 'act out' their original conversations by reading from the transcript. They were partnered in each conversation by the same person with whom they had originally taken part in the experimental session. These recordings gave rise to a set of read materials.

From the transcripts, twenty different word types were selected for each speaker. The words which were selected were all content words, and each word had been uttered by the speaker in question when addressing both the familiar and the unfamiliar addressee. As far as possible the items were chosen from the transcripts in which the subject was acting as Instruction Giver.

The location of the first occurrence of each of these items was identified on each of the four tapes (Spontaneous / Familiar; Spontaneous / Unfamiliar; Read / Familiar; Read / Unfamiliar); the materials were sampled at 16kHz and their durations measured using the ILS signal processing package, using conventional acoustic landmarks to identify word onsets and offsets [1]. The results presented in the next section were thus based on the analysis of 640 word tokens: 8 speakers X 20 word tokens X 2 addressees (familiar, unfamiliar) X 2 versions (read, spontaneous).

### 3. RESULTS

Table 1 shows the mean duration of the words in the four conditions, for all eight speakers.

A three-way analysis of variance (Version X Addressee X Speaker) was conducted. Not surprisingly, differences between speakers were highly significant ( $F(7,152) = 3.21, p = .0034$ ), partly because of differences in the speech habits of particular speakers and partly because no attempt was made to match word types across speakers, resulting in a different number of one, two and three syllable words in each sub-sample. Similarly, a Version effect was observed which was similar to that previously reported in the literature [5]: spontaneous tokens were longer overall than read tokens ( $F(1,152) = 28.08, p < .0001$ ).

Table 1: durations of words (msec)

Spkr	Fam		Unfam	
	Spont	Read	Spont	Read
1	393	319	322	323
2	451	362	414	355
3	279	281	278	269
4	383	330	364	354
5	370	363	444	452
6	467	411	480	426
7	421	365	466	391
8	338	343	390	360
Mean	388	347	395	366

Addressee was not significant as a main effect ( $F(1,152) = 2.89, p = .0912$ ), but it interacted with the Speaker variable ( $F(7,152) = 2.80, p = .0091$ ): further analysis by Scheffé test revealed that all but two speakers (1 and 2) exhibited the predicted Addressee effect for both read and spontaneous speech: that is, words were shorter when addressed to a familiar addressee than an unfamiliar addressee. In a subsequent analysis of variance of the durations of word tokens spoken by these six speakers, Addressee proved significant as a main effect ( $p = .0033$ ), and did not interact with either of the other variables.<sup>2</sup>

### 4. CONCLUSION

The experiment described here offers some support for the hypothesis that speakers shorten words when conversing with people whom they know well. The majority of the speakers here exhibited the predicted effect. Further work is now in progress to examine a number of related issues. First, more data needs to be examined to discover how generalisable these preliminary results are to a larger number of speakers. Second, a wide variety of factors is known to affect word duration, but given the nature of the elicitation task it was impossible to control for all of these. Pause location, speech rate and syntactic structure are among the variables we plan to examine; however, analyses we have already conducted show that the Addressee Familiarity effect remains even when word frequency and word length in syllables are taken into account. Finally, we wish to determine whether speakers alter other aspects of the forms of spoken words in response to addressee familiarity: research is in progress to examine the effect of the variable on speakers' application of connected speech rules such as stop deletion (see [14]).

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### NOTES

(1) The design of the maps being used in a large-scale study of Scottish English is described in [14].

(2) It is interesting to note that the two speakers who failed to exhibit the Addressee effect were the first pair to take part in the experiment, and that their performance differed from that of the other speakers in other respects; in particular, their conversations were over twice as long as those of other participants in this and other studies using the maps task. It may be that their unusual attention to detail in the task led them to adopt unrepresentative linguistic behaviours.

(3) See also Bard and Anderson (this volume).

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