

## THE PHONOLOGY OF DRUNKENNESS

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Although it is true that the intoxicated have been mimicked by comedians, story tellers and writers of fiction, the effects of alcohol on speech have too long been taken for granted by linguists. The purpose of this paper is to demonstrate what really happens as a native speaker of English gets drunk. In this paper, we will not discuss the incoherent stages of drunken speech, although it may be a study worth pursuing provided one can figure out what the drunken speaker intends to say. The scope of this study is restricted to analyzing those phonetic changes that take place in the initial stages of drunkenness, where there is no major problem in coherency.

Our experimental procedure was as follows. We began by taking a sample of the subject's speech while he was sober. This speech sample, as all samples taken, consisted of the reading of a prepared word list,<sup>1</sup> plus an impromptu monologue from the subject or conversation between the subject and the person administering the experiment. After obtaining enough sober data to determine some sort of individual control which we could compare the later samples to, we proceeded to get the subject drunk. Our intention was to make the intoxication as systematic as possible, so the alcohol, the finest 86 proof straight bourbon our pocketbooks could afford, was administered to the subject orally in amounts of one ounce every twenty minutes. This proved adequate since our subjects for the most part were not of the 'heavy drinker' category, although without a doubt there are those who could have finished the whole bottle at this rate without any perceivable change in their speech. A speech sample such as the one noted above was taken every twenty minutes, just prior to the one-ounce drink. Thus our experiment proceeded with the subject reading, talking, drinking and then waiting twenty minutes before going through this same sequence again. The time the total experiment took was generally somewhere between five to seven hours.

As has been noted by virtually everyone, drunken speech appears to be drawn out. Kozhevnikov and Chistovich have shown that normal slow speech displays lengthening chiefly in the vocalic segments of the syllables. Our observations of drunken phonology, however, revealed several interesting cases where the lengthening is found for the most part in the

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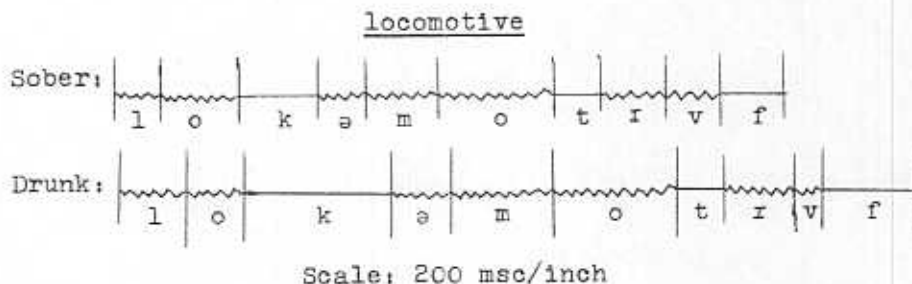
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consonantal segments. Consider, for instance, the differences in segmental length as exhibited by the following sober and drunk comparison of the word 'locomotive'.



This consonant lengthening, we might also add, seems to occur only in the unstressed syllables, with the primarily stressed syllables showing little or no proportionate increase at all. We are not, of course, ruling out the occurrence of vowel lengthening in drunken speech, but rather we are pointing out that this 'drunken drawl' also involves lengthening phenomena that are not characteristic of sober slow speech.

In the speech of our subjects we also found several different sound replacements. For instance, we observed the devoicing of word-final obstruents, as in the following words for one of our subjects who gave us fourteen coherent readings: tease [tis] (10, 11, 14), bed [bət] (11, 13), dog [dɔk] (11-14), locomotive [lokəmotɪf] (10, 14), sing [sɪŋk] (10, 14), bread [brɛt] (13), garage [gərəʃ] (13, 14), judge [ʃʌʃ] (14), hand [hənt] (14), and in conversation [xnt] for and.

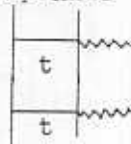
We also observed the commonly recognized merger of s with š, as in the words yes [yɛš] (14), spin [špɪn] (13), shrimp [šrɪmp] (11, 13), first [fɪršt] (12, 14), lust [lʌšt] (13), stress [štrɛs] (13, 14), historical [hɪštɔrɛkəl] (10).

Finally, the affricates sometimes lost their affrication and were pronounced as fricatives; thus ʃ was replaced by ž and č by š, as in the words church [šarč] (14) and judge [žʌʃ] (10).

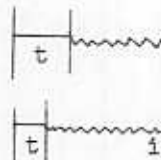
In general, we can say that these phonetic replacements do not appear until the tenth reading or so. Yet all these examples show that there is no absolute consistency in the application of such phonetic replacements once they begin. For instance, tease is pronounced correctly with a final voiced sibilant on the twelfth and thirteenth readings, but in the

two preceding readings was in the last reading cannot even say that within a single word church and judge which are de-affricated.<sup>4</sup>

These phonetic replacements can be interpreted as p whether drunk or sober representations. C of tease /tɪz/ in c by a sober speaker

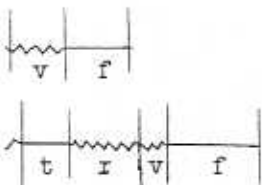


There are obvious p two words. As is w tease is considerably the final z in tease final-devoicing even perceived as being this final z is actually which is voiced; no over twice as long. Now consider that that were perceived segment:



In these cases, when that there is no sibilant. Phonetically, the c final segment. The is drastically reduced portion has been all length of the f vowel) remains appropriate for the perceptual that final devoicing pronunciation of te milliseconds earlier.

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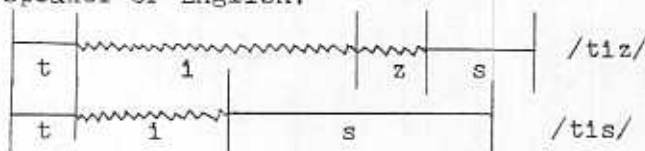
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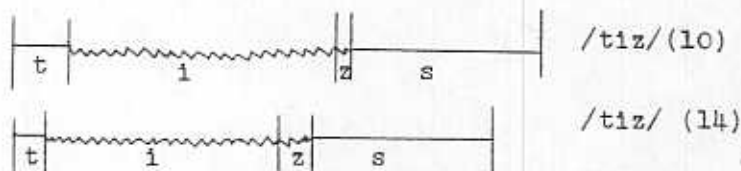
two preceding readings the final z was devoiced, as it was in the last reading, the fourteenth. In fact, we cannot even say that the replacements occur consistently within a single word, as is seen in the examples church and judge where only the initial affricates are de-affricated.<sup>4</sup>

These phonetic replacements should not, however, be interpreted as phonemic replacements. Speakers -- whether drunk or sober -- have the same psychological representations. Consider, for instance, the pronunciation of tease /tiz/ in contrast to the pronunciation of /tis/ by a sober speaker of English:



There are obvious phonetic differences between these two words. As is well-known, the vowel length in tease is considerably longer than in /tis/. Also, the final z in tease is not completely voiced; final-devoicing even occurs in a segment which is perceived as being voiced. The devoiced portion of this final z is actually longer than that portion which is voiced; nonetheless, the final s in /tis/ is over twice as long as the finally-devoiced portion of z.

Now consider the analysis of two examples of tease that were perceived as having a final voiceless segment:

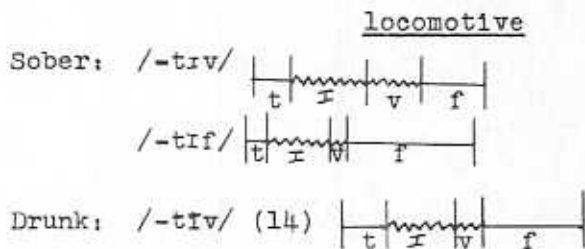
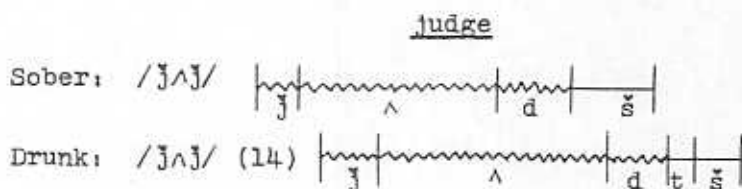
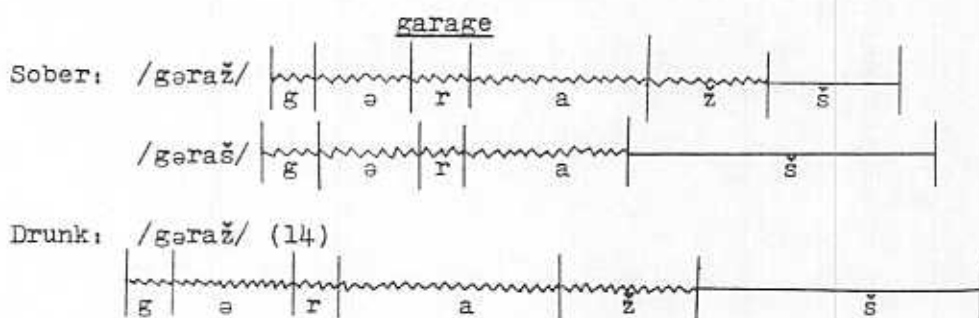


In these cases, when the speaker is drunk, we noticed that there is no significant change in the vowel length. Phonetically, the change is in the pronunciation of the final segment. The voiced portion of the final segment is drastically reduced and, correspondingly, the voiceless portion has been increased. Nonetheless, the overall length of the final segment (like the length of the vowel) remains approximately the same. The explanation for the perceptual change is therefore due to the fact that final devoicing, which even occurs in the sober pronunciation of tease, begins up to one hundred milliseconds earlier in the speech of a drunk.

Psychologically, the speaker is trying to say tease. This is clearly supported by the fact that the i vowel in the finally-devoiced form of tease remained long. These results show that the perception of vowel length is not over-ridingly significant in the interpretation of word-final voiced segments. Rather, it is the relative increase in the length of the devoiced portion of the final segment, in comparison to the length of the voiced portion.

Final devoicing is also found in language acquisition (and also reflected as a phonological rule in many languages of the world). In order to learn a voicing contrast in word-final position, the speaker must learn to sufficiently extend voicing into the final segment, thus overcoming an inherent tendency towards final devoicing. In drunken speech, we are apparently observing a loss in this acquired ability to extend voicing.

Similar analyses explain the perception of final-devoicing in garage, judge and locomotive:



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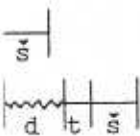
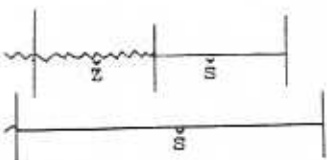
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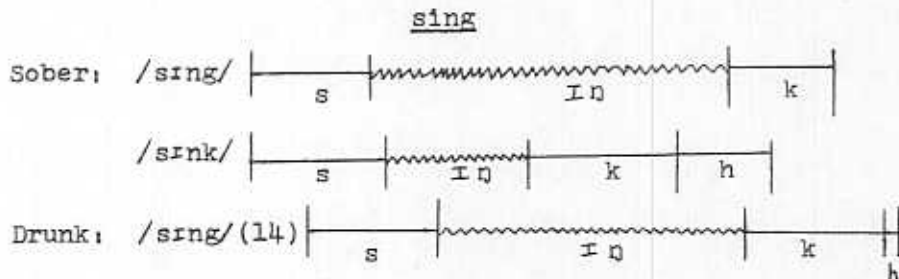
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The final devoicing in sing cannot be explained in precisely the same terms. The pronunciation of sing as [sɪŋk] shows that psychologically there is a /g/ in sing, even though phonetically we get only [ŋ] in sober speech. In drunken speech we never get any examples of a voiceless stop being pronounced at the end of a psychologically word-final nasal. There are no pronunciations of [pɪnt] for pin or of [mamp] for mom. But psychological word-final stops can be devoiced in drunken speech, as in the examples and, bed, dog, bread and hand.

The length of the segments [ɪŋ] in sing remains fairly constant, even when a final voiceless k is pronounced in intoxicated speech, another indication that psychologically sing ends in /g/:



It is the voiceless release that is responsible for the perceptual interpretation of sing as sink.

We have observed similar examples in language acquisition, where the devoicing of final ŋ as ŋk occurred in the speech of a three-year old who pronounced sing as [sɪŋk]. At this stage of acquisition, this child also devoiced the final g in dog, giving [dak]. These facts seem to indicate that the loss of final voicing in drunken speech is related to the difficulty children have in learning to pronounce, in word-final position, voiced obstruents in contrast to voiceless ones.

But the replacement of s by š and the de-affrication of č and ĵ as fricatives is not characteristic of children's language. In earlier stages of language acquisition, children replace š by s (or a sound most closely associated with s) and the affricates by stops. Thus not all the sound replacements found in drunken speech are equivalent to the sound substitutions of language acquisition. As suggested by the case of final-devoicing, the replacement of s by š is not a psychological replacement. In our experiments,

intoxicated speakers frequently stopped after substituting a š for an s and then repronounced the word, carefully trying to avoid the pronunciation of the š. For example, once one speaker, in saying the word spin, began with š, then stopped, and with some effort pronounced spin correctly. Perceptually, the drunken speaker is very much aware of his mispronunciation of s's, but finds it nonetheless very difficult to pronounce them correctly.

In this paper we have only dealt with the characteristics of the coherent drunken speech as performed by our inebriated informants. These informants, outside of being intoxicated, were all perfectly healthy normal people, who had English as their native language. We believe it would be rewarding to include in any further research data from a non-native speaker of English whose native language is German. If such an informant did not lapse into German exclusively, it would be interesting to see how he would do with respect to the final devoicing observed here in these experiments. We would expect that final devoicing would show up much sooner than it did with the English informants.

We have observed that certain characteristics of drunken speech, in particular final devoicing, correspond to phenomena found in language acquisition. A more extensive comparison of acquisitional and drunken phonology is needed to more fully define the differences between the two.

Important clues to drunken pronunciation may be gained by a study of certain cerebellar disorders which result in speech that has often been characterized as sounding like drunken speech.

This brings up another question concerning perception and production of sounds. We have touched on this topic in discussing the drunk's attempts at correct pronunciation and our own interpretations of what he was saying. A comparison of drunken speech with how sober people, such as professional entertainers, impersonate drunken speech should be interesting.

In short, there seems to be a lot of possible directions and untouched research concerning drunken phonology, and it is surprising that this subject has been handled with such abstinence. Our preliminary investigations indicate that the study of the phonology of drunkenness can make substantial contributions to the study of natural phonology.

- 1 The words were: rabbit, church, mom, none, pray garage, cut, dc tough, this, th bait, bought, t hand, mush, lus
- 2 The numbers in of the word ref pronunciation c the speaker was
- 3 This informant is sober.
- 4 Of course, this may simply be a a word-final af

## Footnotes

- 1 The words were: shrimp, Sue, shoe, light, bed, bread, rabbit, church, judge, spin, pin, sing, witch, which, mom, none, pray, play, right, refrigerator, leisure, garage, cut, dog, yes, happy, historical, first, tough, this, thin, either, ether, zoo, tease, keen, bait, bought, book, locomotive, joy, house, kill, hand, mush, lust, stress, bet, tooth, bin.
- 2 The numbers in parentheses following the pronunciation of the word refers to the readings in which this pronunciation occurred. The initial reading, when the speaker was sober, is given as 1.
- 3 This informant pronounces shrimp as [srimp] when he is sober.
- 4 Of course, this initial de-affrication in these words may simply be a case of dissimilation with respect to a word-final affricate.

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