

In and out of the laboratory: Using a variety of data sources to study variation in speech

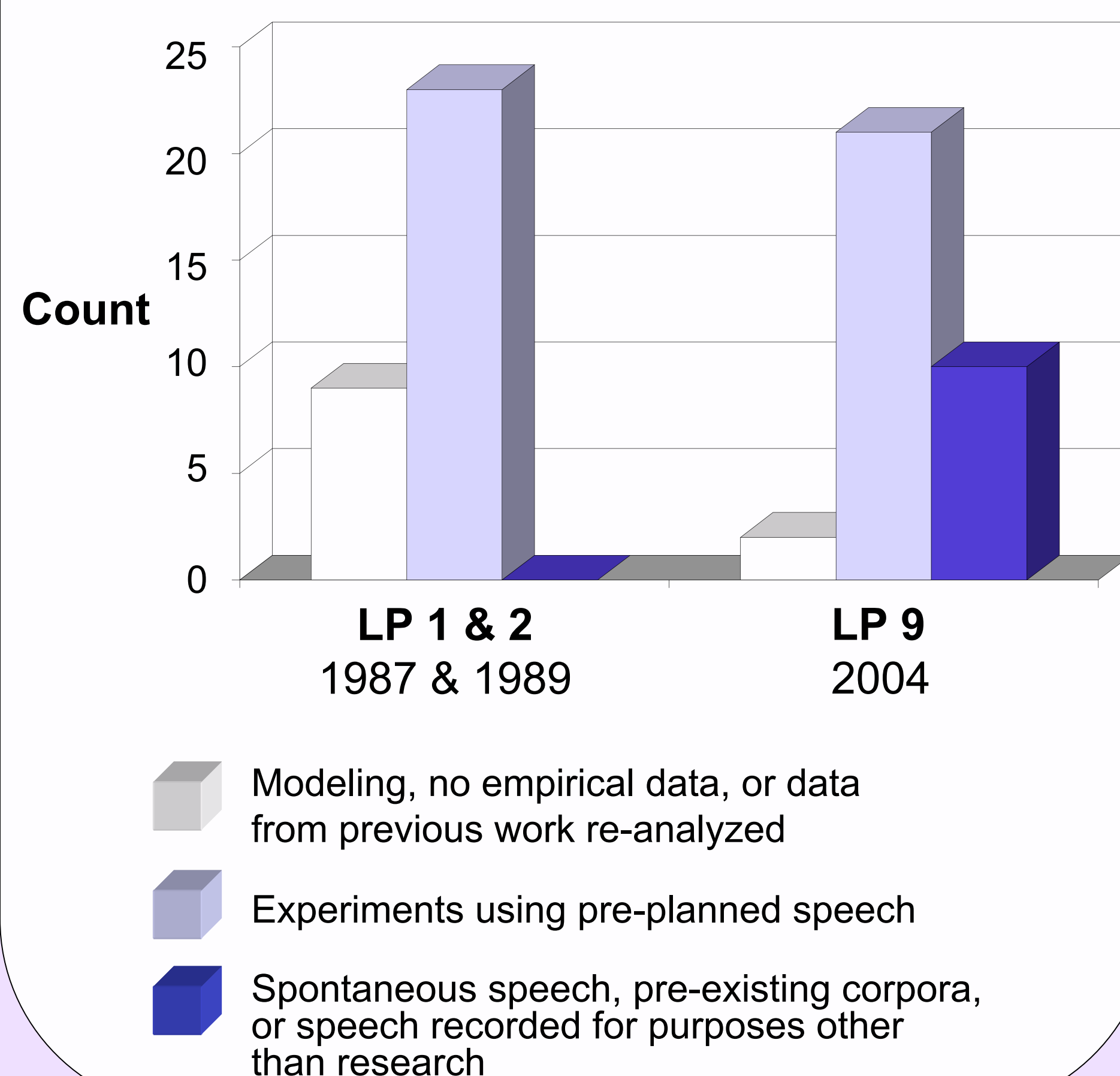
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Part 1. Changes at LabPhon

One striking evolution in the papers presented at LabPhon conferences has been the expansion of the range of data types employed. In order to document this, the types of data used in presentations at LabPhon 1 and 2 were compared to data presented at LabPhon 9.

- Both invited and contributed oral presentations were included, but not commentaries or posters.
- Many papers used multiple data sources, so the total sources exceeds the total number of papers.



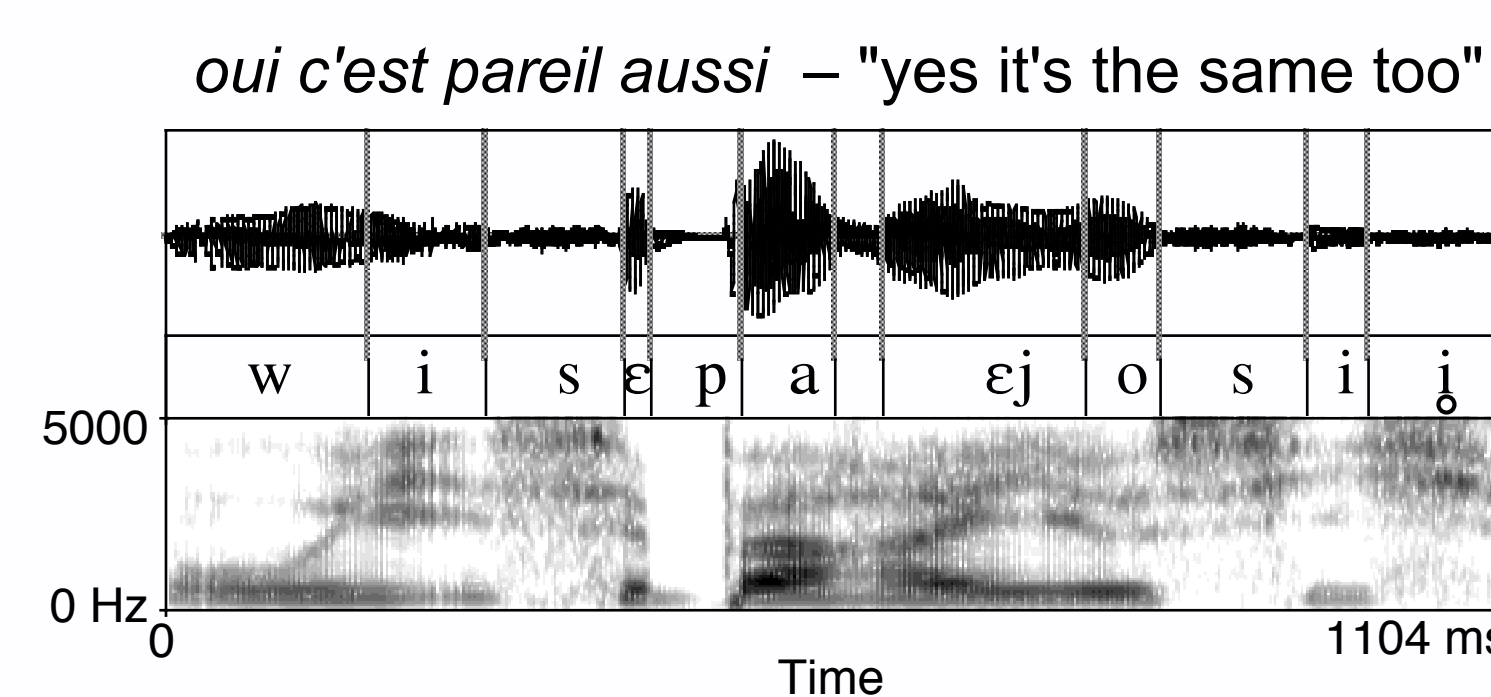
Part 2. Case study: investigation of phrase-final devoicing in French in two styles of speech

The phenomenon

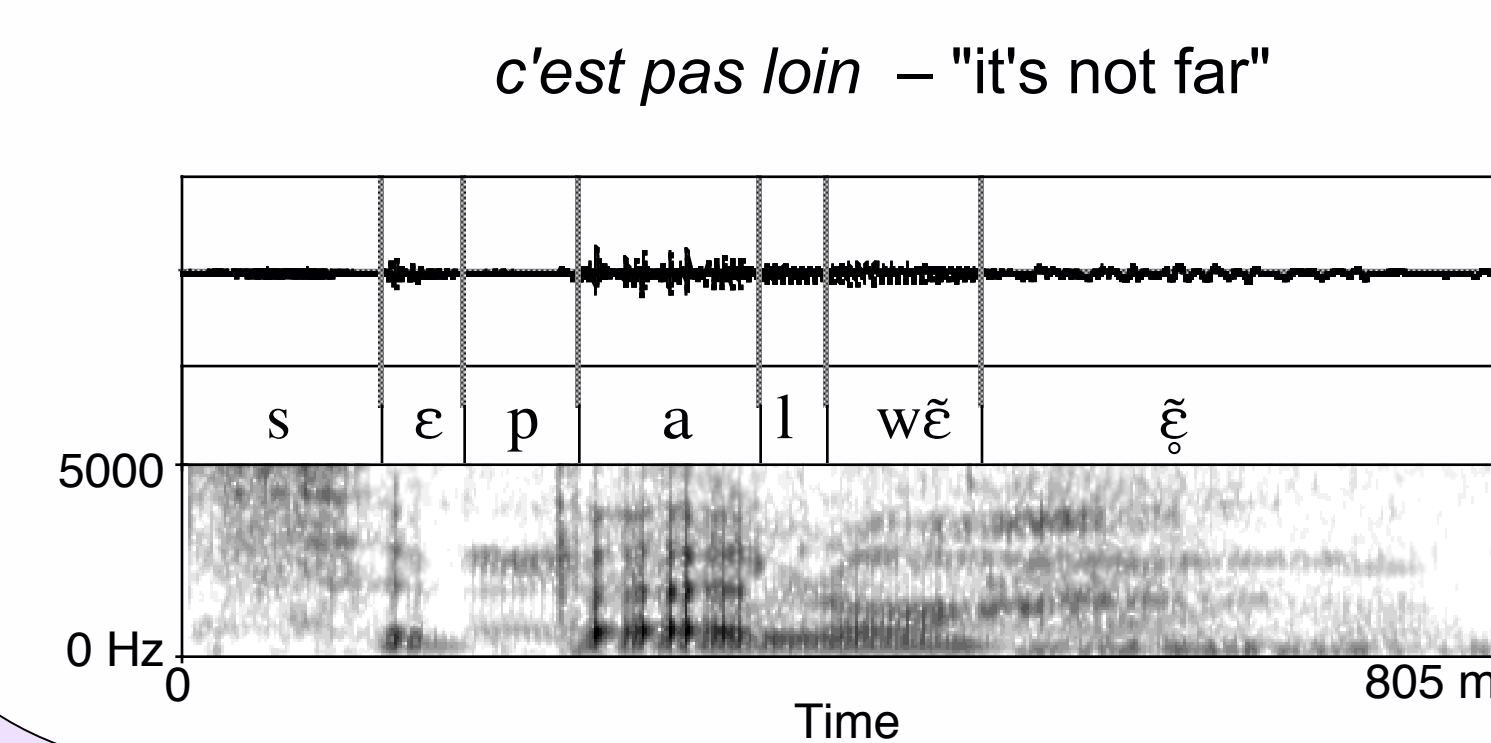
Present-day speakers of French sometimes devoice vowels. When the devoiced vowel is high, the resulting sound is similar to a voiceless fricative, as in the common pronunciation of *oui* as [wɪ]. When the devoiced vowel is mid or low, the devoiced portion may sound more like an exhalation. Previous work has observed this kind of devoicing phrase-finally, never medially.

Samples of devoicing

The most frequently devoiced vowel is [i], which results in a sound much like a voiceless fricative.



When lower vowels are devoiced, the resulting vowel is less noisy. It is possible that different mechanisms are involved in vowels of different heights.



Why the shift towards more study of speech produced outside a controlled experimental context?

- Technological advances have facilitated work with large corpora, which are especially useful in studying spontaneous speech because of the enormous variability.
- Progress in understanding phonetic patterns as they occur in controlled contexts makes it possible to investigate these patterns in less-precisely controlled speech material.
- Speech tech applications such as automated dialogue systems require the comprehension and generation of spontaneous speech styles.
- These applications also demand a better understanding of phonological patterns in varied discourse and pragmatic contexts, effects that are hard to study without examining meaningful speech produced in the appropriate contexts.

What are the consequences of diversifying data sources?

Comparing the same phenomenon in samples of speech collected under different circumstances illustrates the value of studying phonetics using both pre-planned and spontaneous speech.

Acknowledgements

Merci to the speakers in my experiments and to the LPP in Paris for the use of their recording facilities.

For references, please see the abstract booklet.

Occurrence of devoicing

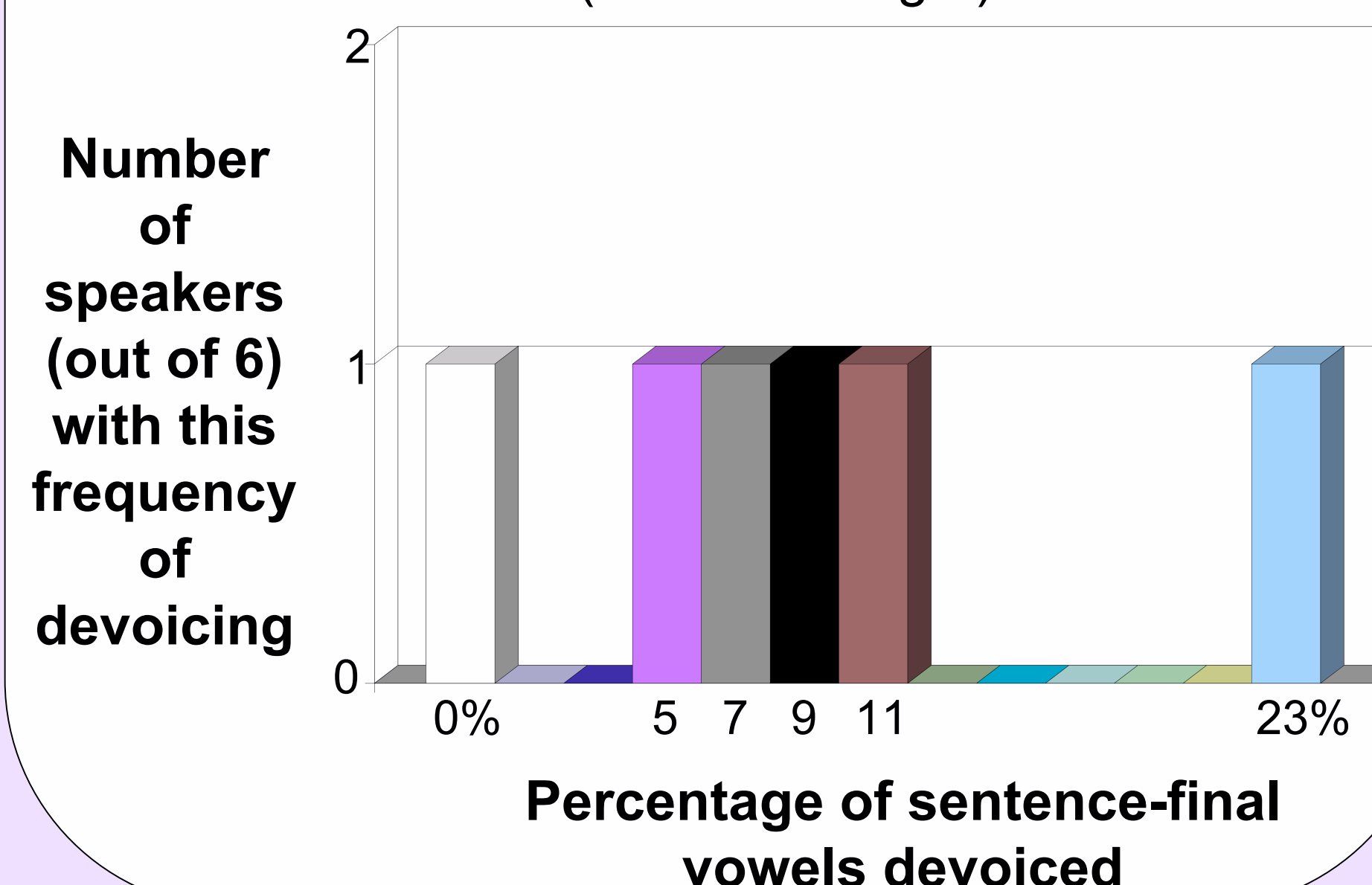
In the data presented here, the devoicing is always partial and final: the vowel always begins with a voiced portion. Voicing ceases but the flow of air continues and the continuation of formants suggests that the vocal tract remains in configuration for the vowel.

Previous work

Fagyal and Moisset (1999) compared ten speakers' patterns of devoicing in conversation among friends, and in reading of a short prepared text. Presented here are results from Smith (2003), which investigated devoicing in 50 sentences read aloud by six speakers, and new recordings of conversational speech (a map task) with ten speakers.

Results: read sentences (from Smith 2003)

The speakers in the reading task devoiced slightly more often, on average, than the speakers in the conversational task (see above right).



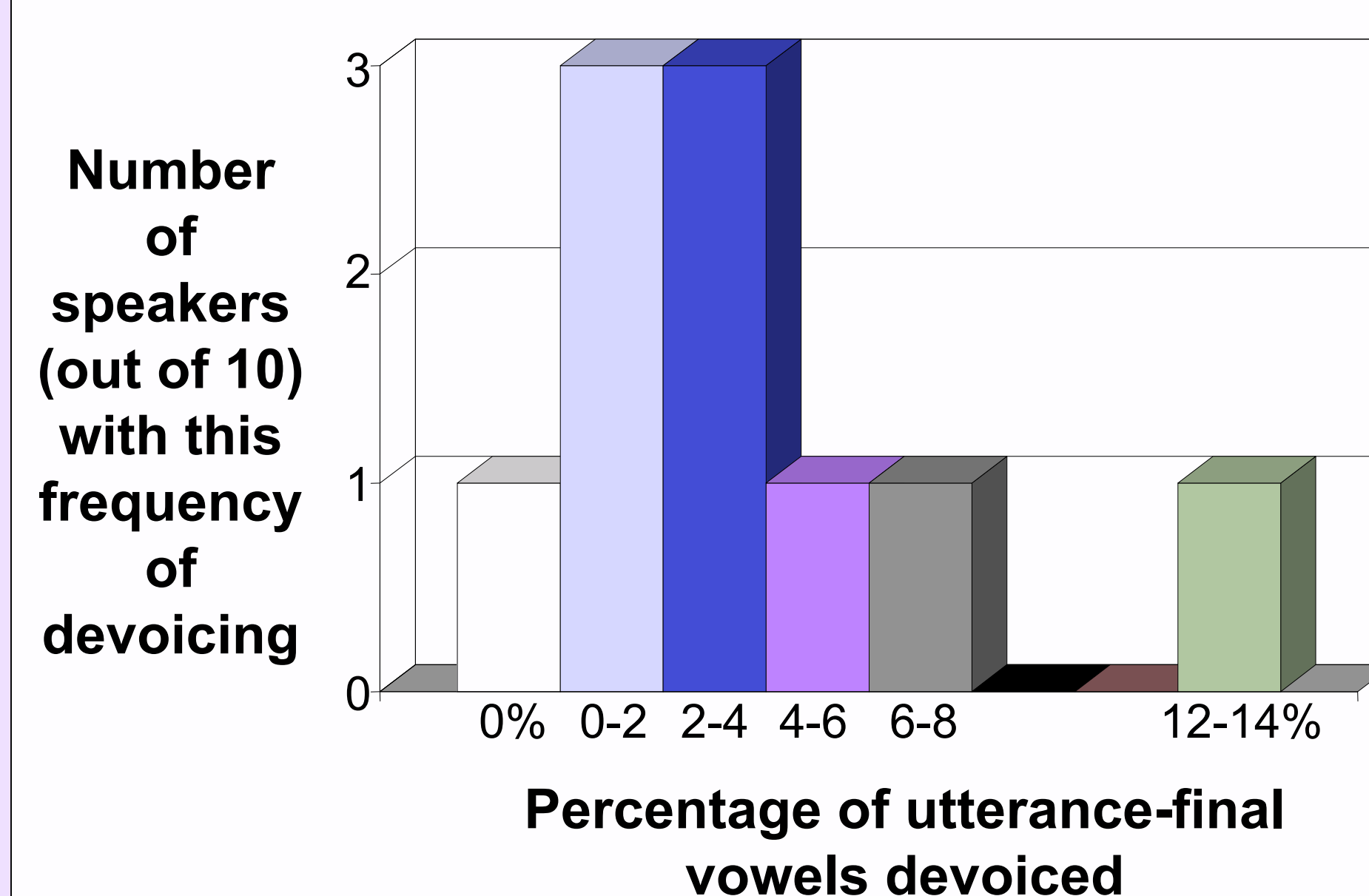
Results: new data from spontaneous speech

Ten female Parisian undergraduates were recorded performing a map task over the telephone, in all cases with the same interlocutor who was not known to them. The duration of these conversations ranged from 4.3 to 7.5 minutes. Devoiced vowels were identified from inspection of the waveform and spectrogram in Praat, and listening.

Only one speaker failed to devoice during this task (but she did devoice in another conversation recorded on the same day).

Two of the speakers devoiced nasalized vowels as well as low, mid and high oral vowels. These had not been tested in read speech because no previous research or anecdotal evidence suggested that they might devoice.

The rates of devoicing shown below are higher than the range of 1-6% reported by Fagyal and Moisset (1999) for conversation.



Effects of phrasal context

- The most favored context for devoicing is IP-final with L%. This was the only environment in which Fagyal & Moisset (1999) reported devoicing, in conversation or in reading.
- Devoicing is possible, but infrequent, at the end of a phrase with a H% (Smith 2003).
- Phrase-medial devoicing (not previously observed) occurred in 4 out of 81 instances of devoicing in the conversational data. All 4 instances involved the word *oui* "yes".

Possible reasons for differences between these data and previously-reported results

- Different pragmatic contexts seem to be more or less favorable to devoicing, and conversational speech provides a wider range of contexts than a reading task.
- The conversational speech was recorded more recently. If this is a sound change that is spreading, it might have generalized to additional environments during this time.

Consequences for phonological theory

Examining conversational speech provides new evidence for the distribution of devoiced vowels in French beyond the regular conditioning by both prosodic and grammatical factors shown in Smith (2002). It reveals considerable variation among styles of speech, individual speakers and possibly individual lexical items - factors that are not easily integrated into traditional phonological descriptions.

Nonetheless, fine-grained analysis of the temporal patterns in devoicing is probably only possible using pre-planned speech with controlled phonological environments.

Comparison across data types also demonstrates that phonetic data must always be interpreted in light of the speech register and individual characteristics of the speaker and the lexicon, even when these are not under investigation in a specific study.