

Data from Online Production Experiments and Challenges for Collecting Good-quality Recordings for Prosodic Analyses



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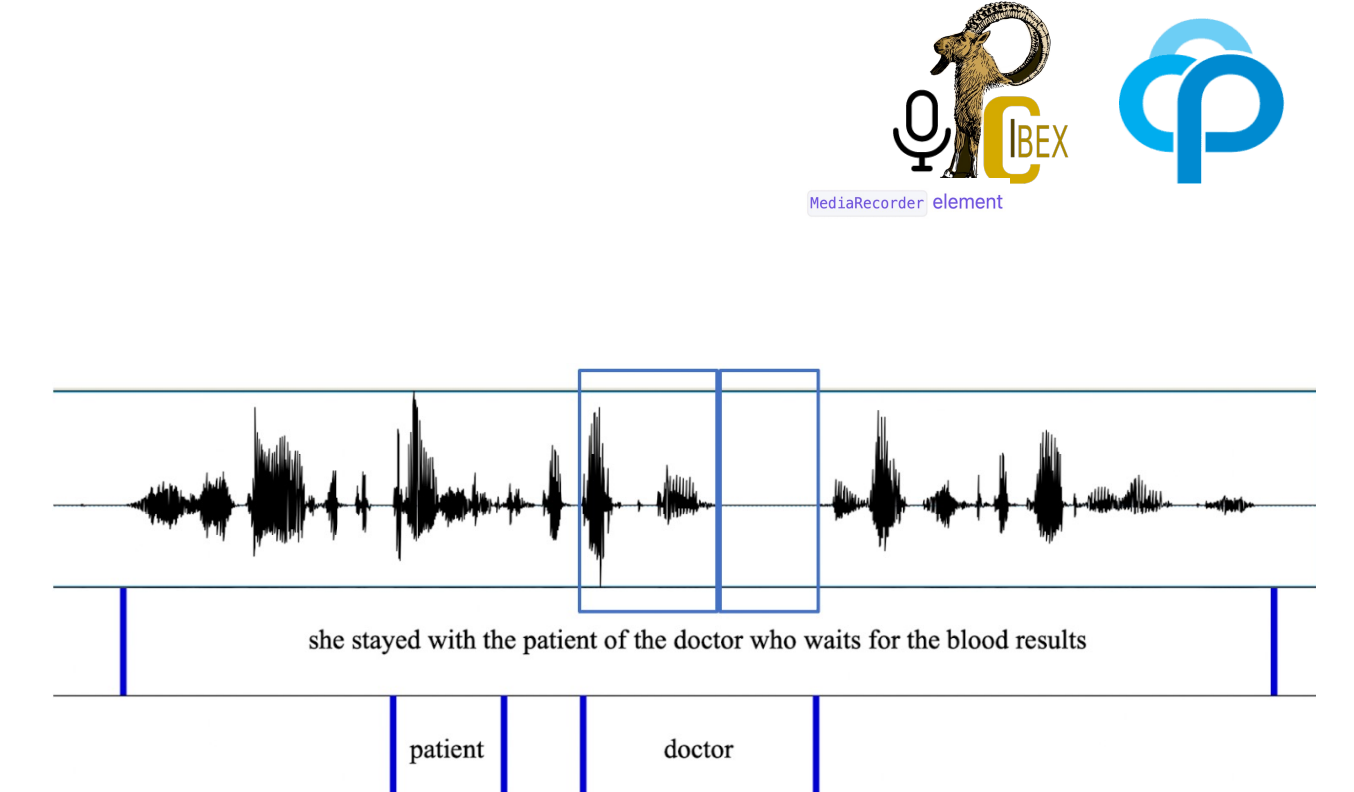
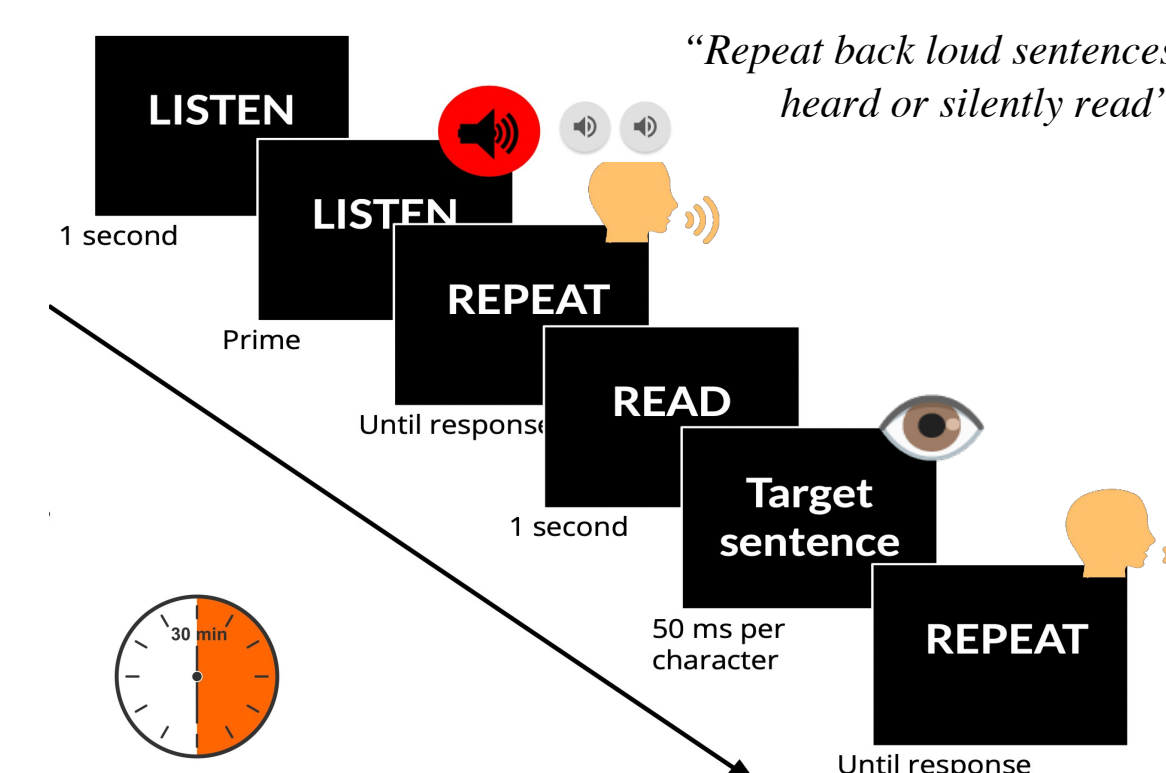


Online Data Collection

- Experimental linguistics
Implementation of sophisticated features and validation of multiple paradigms for online data collection [1] despite concerns about low participant validity [2]
- Phonetic sciences
Old story of remote speech data collection [3] and growing body of tools and methodological literature [4]
 - ✓ Intelligibility of the audio stimuli [5]
 - ✓ Time-accuracy of the recording devices [6]
 - ✓ Reliability of acoustic parameter extraction through comparison of sound quality of remote alternatives and high-quality recorders [7, 8]
 - ! A handful of production experiments online [9-13], mainly measuring latencies and accuracy [9-12]

Challenges

- Crowd-sourcing platform
- Widely accessible experimental platform
- Full sentence productions
- Priming paradigm
- Measurements on specific critical regions of the sentence in the continuous speech stream



Can we collect and process speech production data online, via crowd-sourcing platforms and web-based experimental softwares, for a large-scale experiment aiming at performing prosodic analyses on specific regions of sentence productions ?

Procedures

Technical Setup

- University-hosted Ibex farm server
- Computer-only users - screen width filter
- Chrome only - the most common combination of operating system and web browser [6] and experimental platform stability
- Headset, either built-in speakers and microphones or external ones
- Quiet environment
- Detailed guidelines for a lab-like environment and good-quality recordings



Recording Procedure

- Audio quality check(s)
- Tips and reminders on how to improve audio quality
- Asked to speak even if inaccurate, to detect technical issues
- Immediate upload to the server in the background
- Download recording zip file locally as a backup

Data Processing and Analysis

- Separate WebM files stored in zip files with unique names by PCibex
- Offline conversion to .wav files for analysis
- Automatic transcription using Praat scripts
- Manual revision for sound problems, accuracy errors, and discrepancies
- Automatic speech-to-text alignment using MFA
- Duration measurements
- Pitch extraction on a subset of data using ProsodyPro

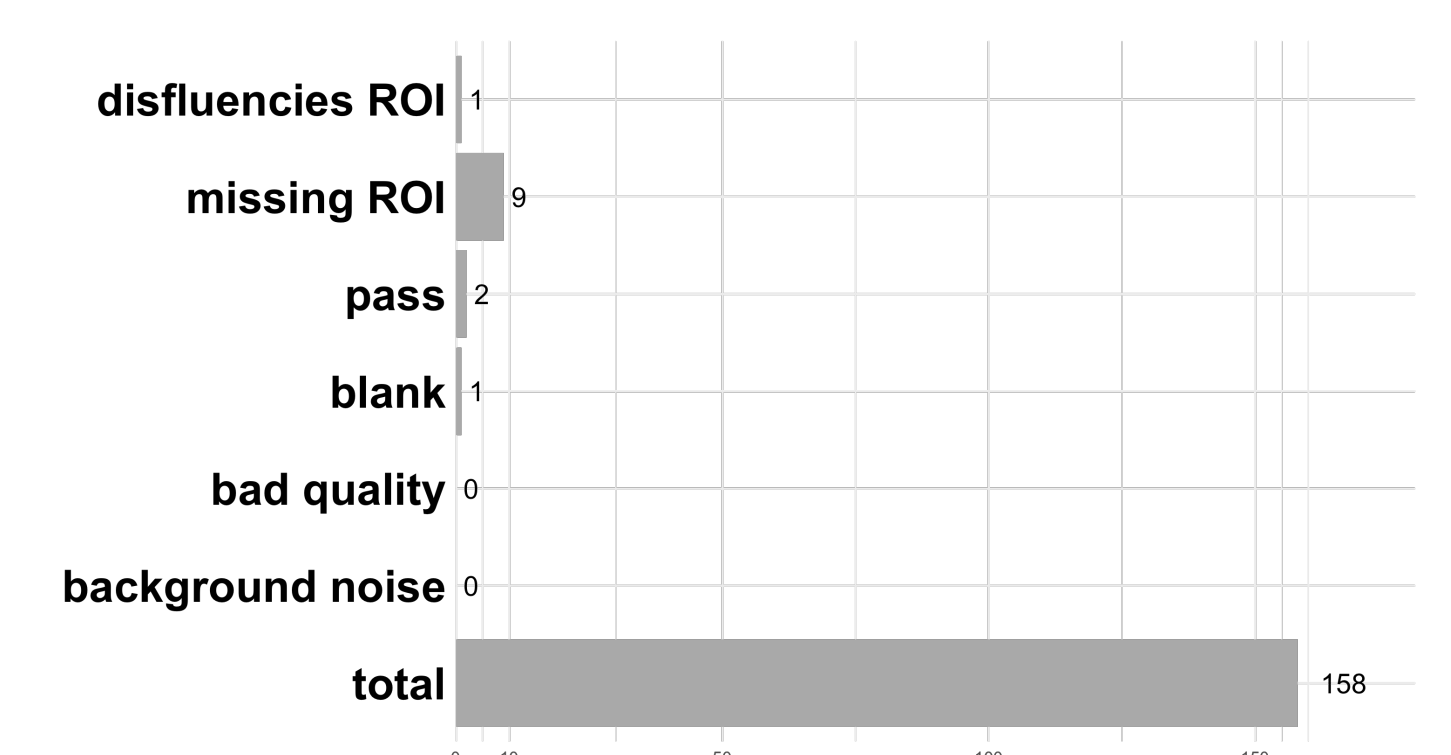
Sanitary Check

- In-lab web-based pilot - qualitative feedback on the task

Results

Pilot

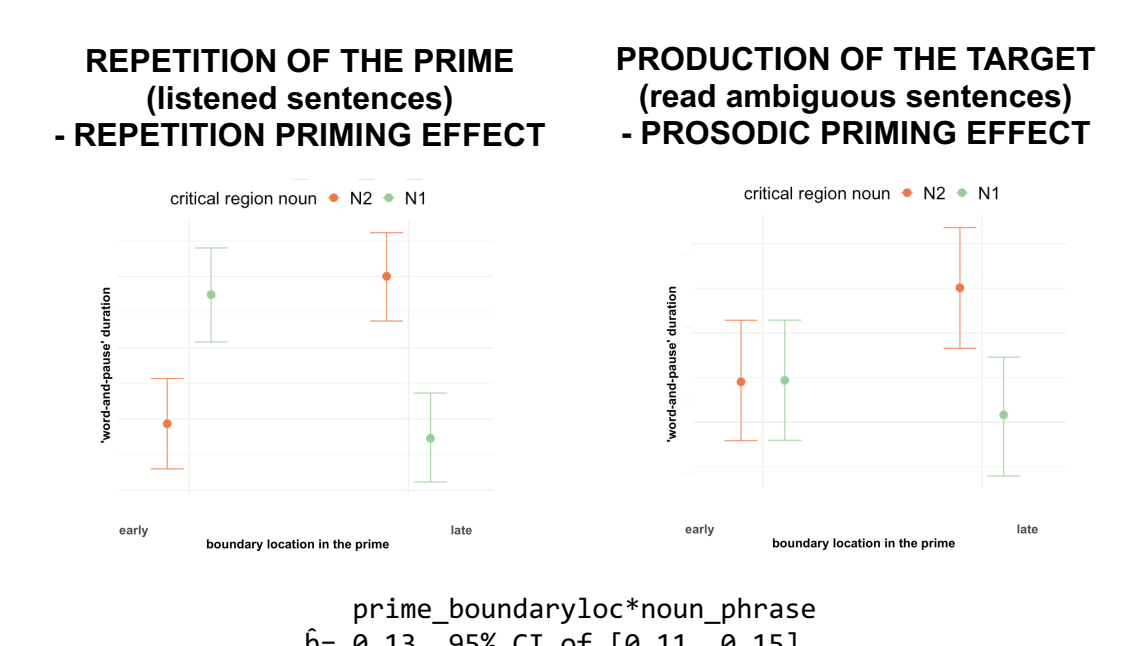
- 6 native British English speakers, 4 analyzed
- Overall evaluation of all audios
- Analysis on a subset of 158 files
- ✓ General good quality



Full-Scale Experiment

Analyzed participants	40	20
Good participants	23	17
Good recordings	1608	235

- ✓ file conversion
- ✓ annotation
- ✓ MFA speech-to-text alignment
- ✓ script to measure and extract durations
- ✓ statistical modelling
- ✓ scripts to extract normalized pitch curves
- ✗ pitch visualization



Discussion

Yes, we can run production experiments online, and still collect good-quality recordings for prosodic analysis as well.

- Reliability of duration measurements vs. pitch visualization problems
 - In line with previous reports of pitch visualization problems [8].
 - The lack of landmarking may account for some variability and alignment issues. However, still unclear to what extent the variability resulting from different devices, HNR levels, recording distances, and noisy environments might still affect intonational measurements in online data collection.
- Small samples (e.g., pilot study) vs. large samples
 - Technical and behavioral issues avoidable in a monitored lab setting.
 - Reduced audio quality and increased accuracy demand are physiological for large samples. However, our results seem rather to denote a general lack of precision and attention during online tasks, in line with previous reports on online participants, even when recruited from lab pools [10].

It takes however time and effort to collect and process the desired amount of useable data.

- Potentially valuable strategy for extending research on less-documented languages or for collecting naturalistic interactional data.
- More suitable for small samples and simple tasks, where noise and attention-related issues can be minimized.

