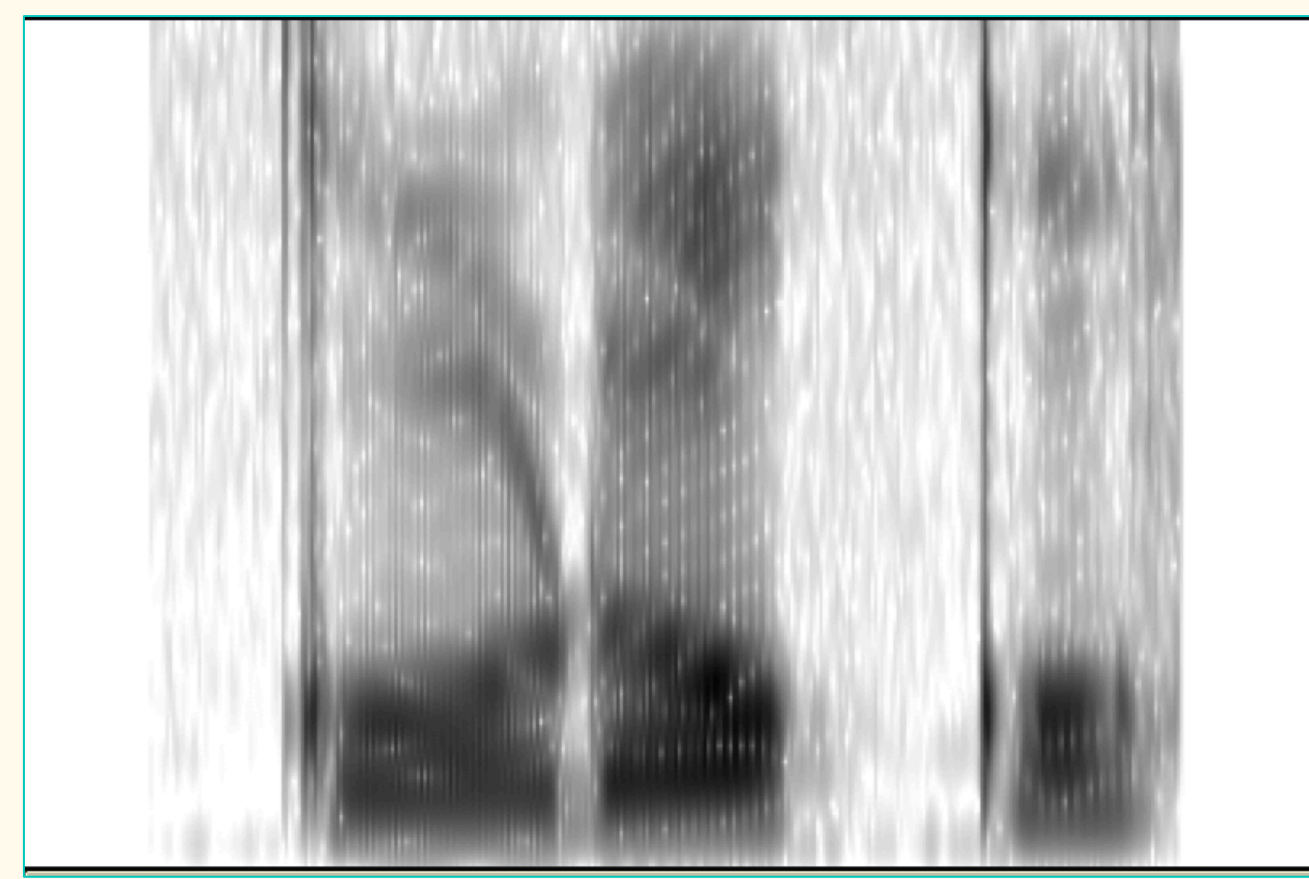


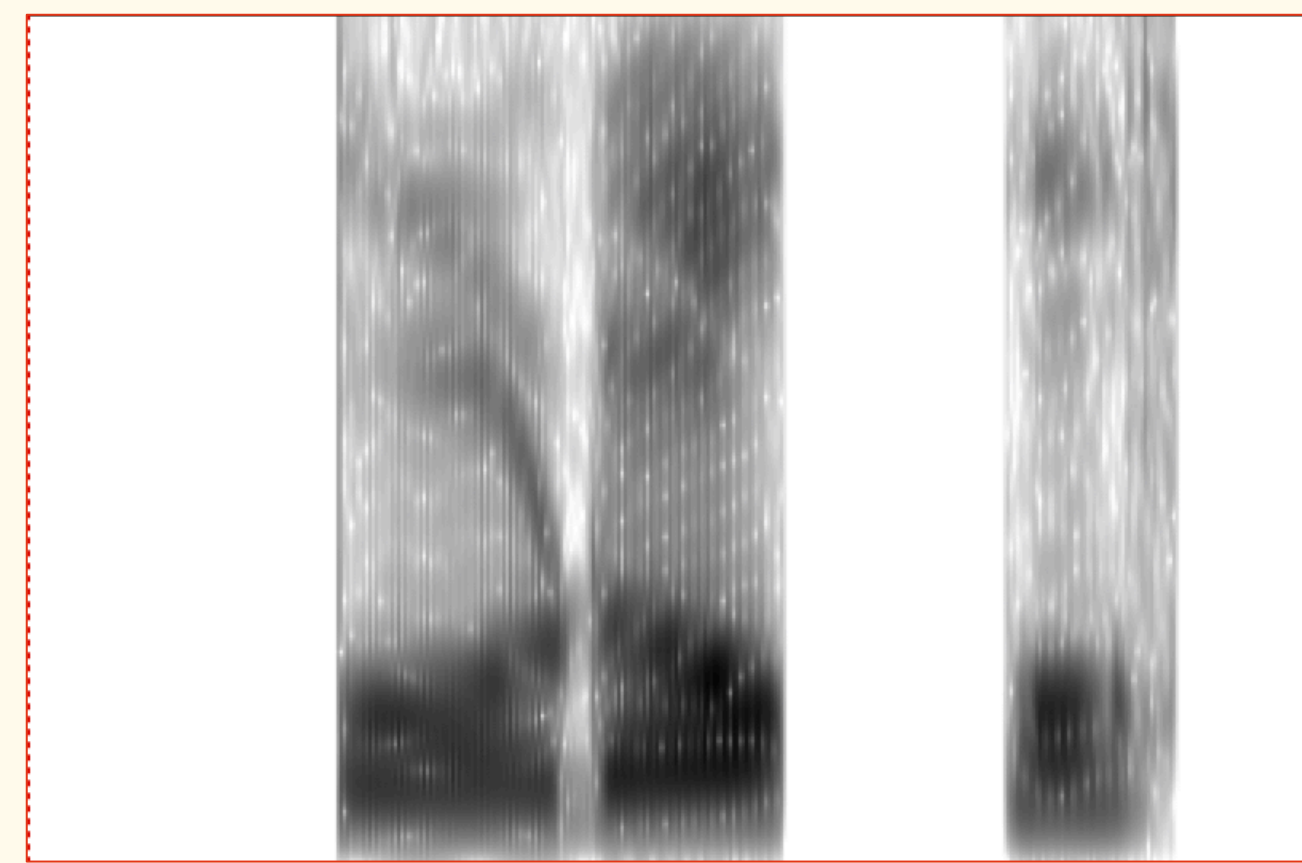
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Experiments 1, 1b Stimuli intact



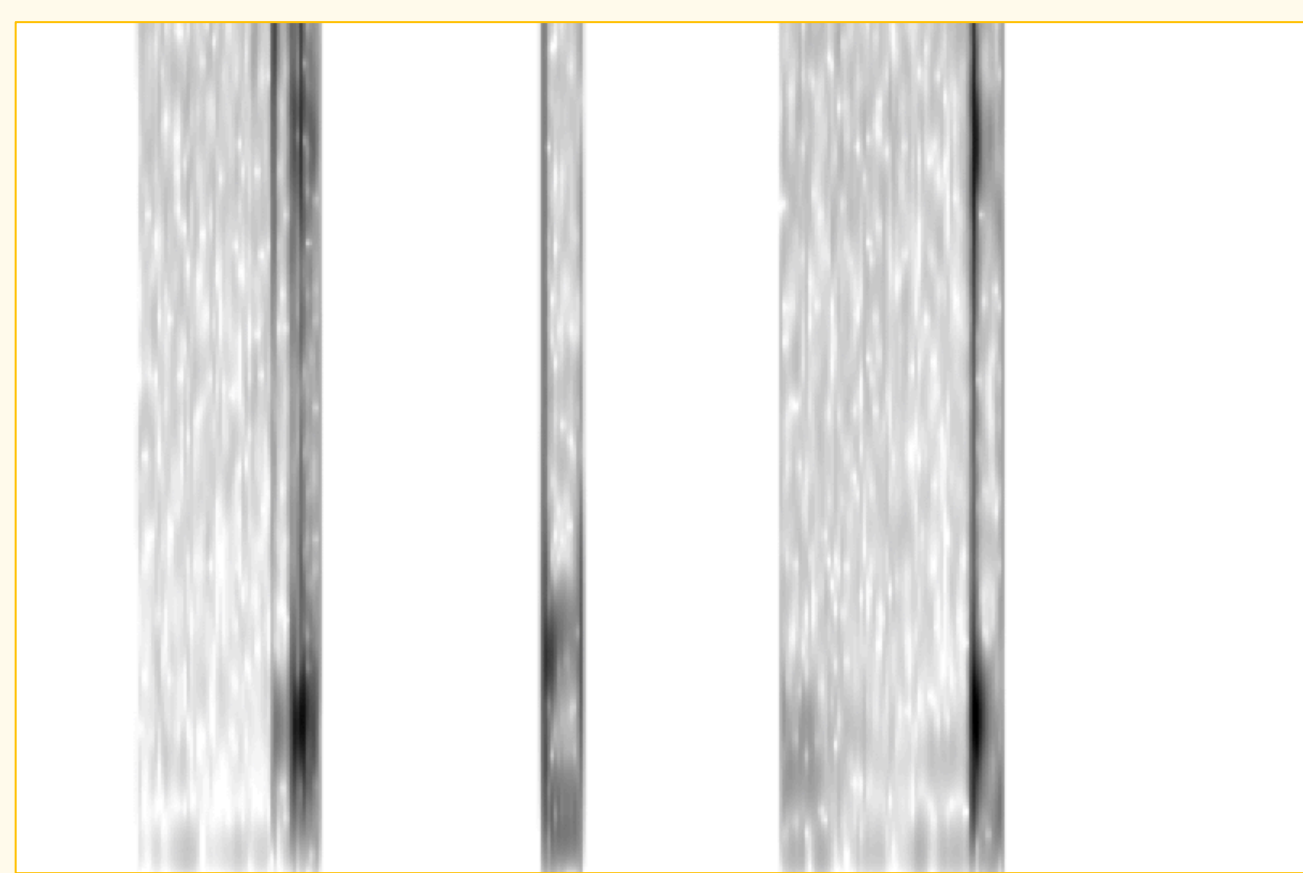
"Koroko"

Experiments 3, 3b Vowels Only

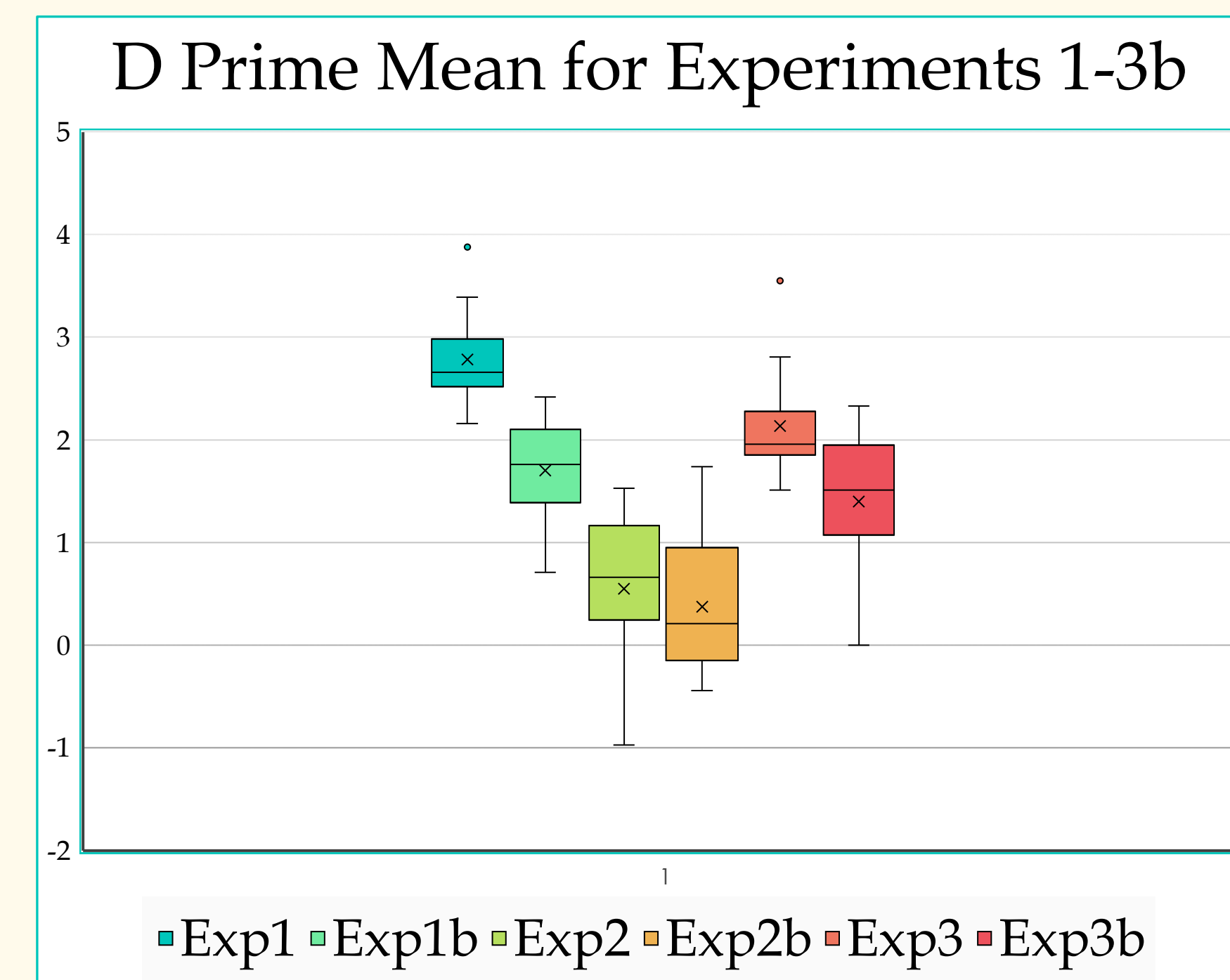


"oro o"

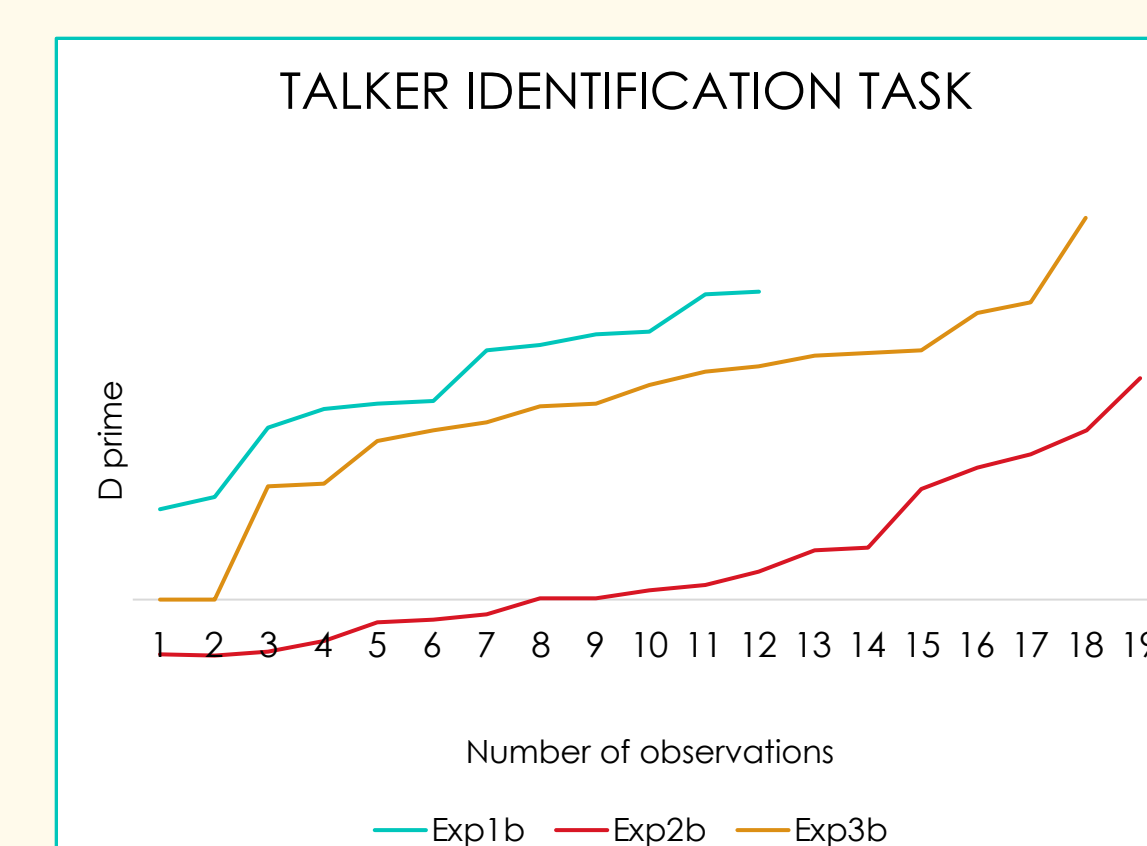
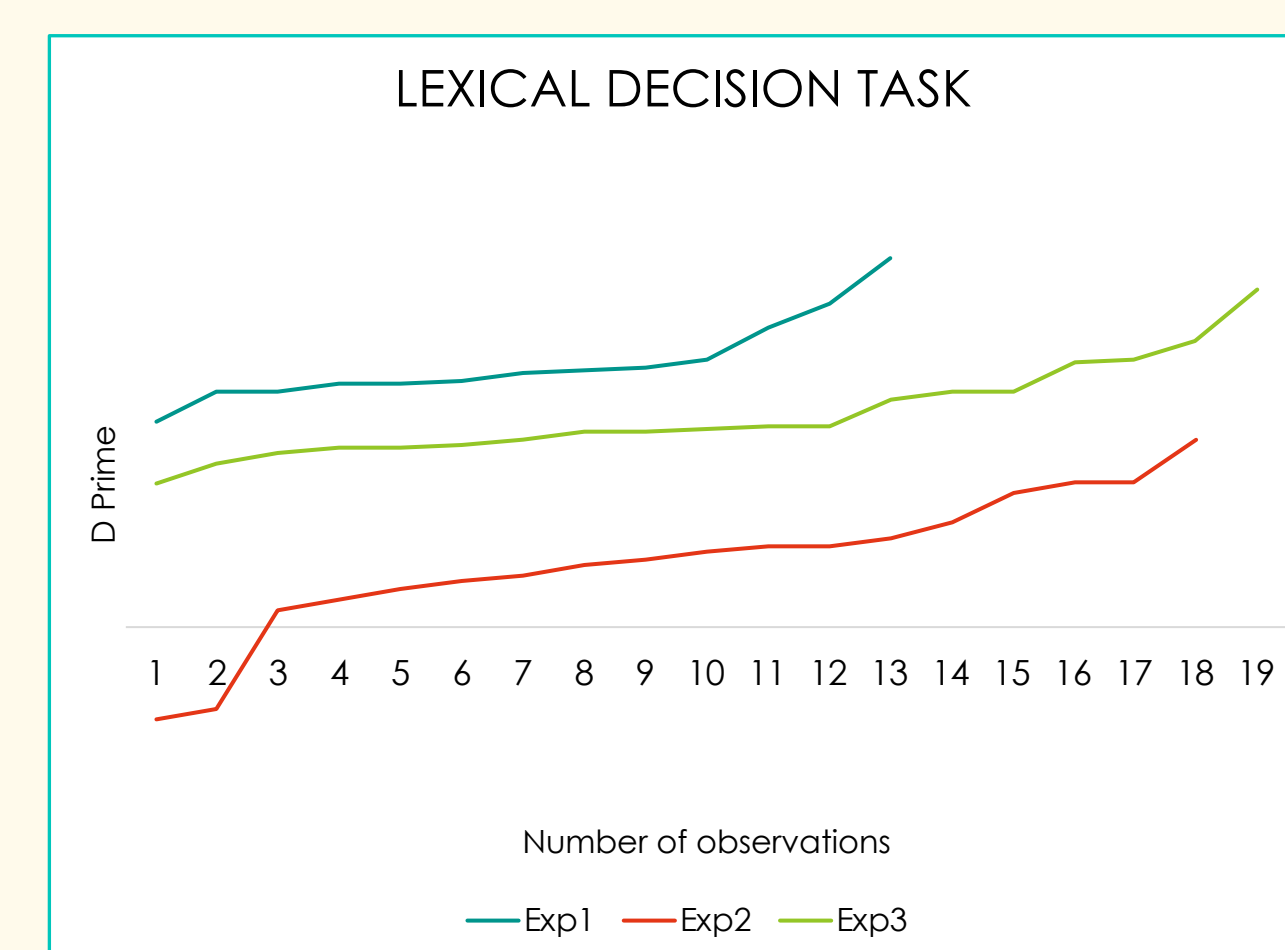
Experiments 2, 2b Consonants Only



"K r k"



"b" indicates talker identification versus lexical decision task



CVrV¹CV¹
Ex/ "Koroko"
"Terete"
"Piripi"

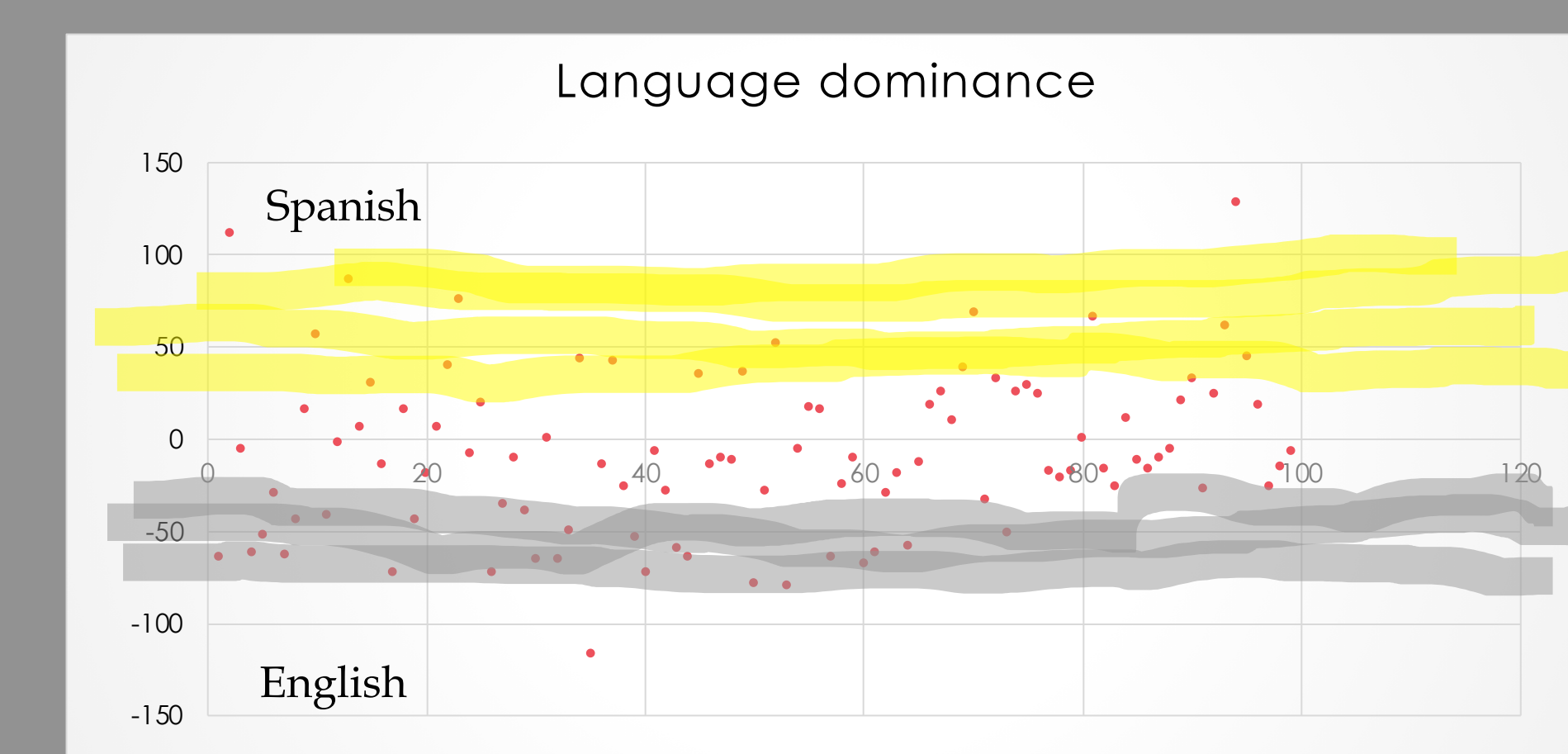
Methods and Materials

Participants in the study were 99 native Spanish speaker undergraduate students. They were asked to perform a same-different auditory discrimination task to detect a word (Experiments 1-3, Version A) or a speaker (Experiments 1-3, Version B). Listeners heard 72 pairs of isolated nonsense words produced by 6 speakers of Venezuelan Spanish. Stimuli in the prompts were equally balanced for talker and word. In Experiment 1, a control group of 25 participants heard unaltered stimuli overlaid with pink noise. In a forced choice task, they indicated whether the pair of words they heard were the same word said twice or two different words (Version A). In Version B, participants were asked if they heard the same speaker twice or two different speakers. Experiments 2 and 3 (37 listeners apiece) followed the design of the first experiment but in Experiment 2, the vowels had been excised from the speech signal (with durations left intact) and in Experiment 3, the consonants had been excised from the signal (also with the durations left intact).

Results (cont'd)

Removing the vowels (Exp.s 2, 2b) greatly impaired the listeners' ability to complete the task. As in previous studies for English, removal of consonants (Exp.s 3, 3b) disproportionately affected listener performance in the lexical discrimination versus the talker identification task. Removal of vowels (Exp.s 2, 2b) did also disproportionately affect listeners' ability to identify talkers, but the effect was smaller.

Figure 3. Self-reported scores on the Bilingual Language Profile (Birdsong, Gertken, and Amengual [2012])



Introduction

- Richness of speech signal known to include socioindexical information as well as information preserving lexical contrast (Elman and McClelland [1988]).
- How speech sounds are processed, categorized, and encoded in memory is strongly dependent on acoustics of the input (Creel, Aslin, and Tanenhaus [2008]).
- Studies on English featuring lexical decision tasks have shown consonants more likely to prompt accurate responses than vowels (Cutler et al. [2000], Fogerty and Humes [2012]).
- Others have claimed that vowels take precedence in identifying individual talkers (Owren and Cardillo [2006]), prompting the question: **Are these generalized characteristics of speech or language-specific phenomena?**
- Languages are known to employ different processing strategies (Cutler et al. [1983]). While English dialects vary greatly with respect to vowel pronunciation, (Hillenbrand and Wheeler [1995]), Spanish dialects vary with respect to consonant realization (Hualde [2005]).
- Does language background shape the speech phenomena listeners attend to when identifying words or identifying speakers?**

Acknowledgments: Support for this project was provided by grant funding from the UCSC Department of Languages and Applied Linguistics.

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Research Questions

In Spanish, is there a substantive difference between listener performance on forced choice lexical discrimination and talker identification tasks based on whether the acoustic prompt consists of primarily vowels or primarily consonants?

Results

D prime results from Experiments 1-3b showed that discrimination was better in the lexical decision task relative to the talker identification task. Discrimination was best in unaltered stimuli (Exp.s 1, 1b), followed by stimuli with consonants removed (Exp.s 3, 3b).

Figure 1. Response rate by experiment

Exp. 1	Exp. 1b	Exp. 2	Exp. 2b	Exp. 3	Exp. 3b
97%	93%	77.5%	69%	96%	91%

Figure 2. Mean, Standard Deviation, and Standard Error by experiment

	Exp. 1	Exp. 1b	Exp. 2	Exp. 2b	Exp. 3	Exp. 3b
Mean	2.782	1.701	0.689	0.275	2.244	1.531
STDEV	0.322	0.561	0.748	0.647	0.504	0.752
SE	0.093	0.162	0.218	0.189	0.149	0.205

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