The role of immediately prior exposure and talker accent on sociolinguistic variant identification

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Introduction

- Words can have different pronunciations:
  e.g., *WALKING* can be pronounced as *walking or walkin'*
- Crucially, these variable pronunciations often carry rich social information about the talker (i.e. age, gender, dialect, accent) [1,2,3]
- **Previous research:**
  speech perception as inference under uncertainty [4, 5]
  e.g., continuum phoneme categorization /s/ or /ʃ/
- **Question**: how do listeners integrate different contextual cues in identifying equally well-formed discrete sociolinguistic variants (distinct phonemes but are not lexically contrastive in the relevant lexical items) under uncertainty ?
- **The current study**:
  - **Focus**: *-ing* (/ɪŋ/) and *-in* (/ɪn/) in English
  - **Two different types of cues**:
    immediately prior exposure and talker accent
  - **Three experiments**:
    Experiment 1: Can variant identification be primed by the immediately prior exposure?
    Experiment 2: Is variant identification subject to influence from talker accent?
    Experiment 3: Do listeners integrate both types of cues equally well?

Materials

- **Creation of uncertainty (ambiguity)**
  - Source extraction done on (ING) (particularly *-in*') through inverse-filtering.
  - Information filtered by the vocal tract, such as place of articulation, being masked while the information produced by the vocal folds, such as intonational contour, remaining unchanged.
  - All the experimental items were recorded by an adult white male native speaker of American English from New Jersey.
- **Norming uncertainty**
  - 38 ambiguous words (also targets used in all our experiments)
  - Task: listen to ambiguous ING-suffixed words and identify whether word pronunciation they have heard:

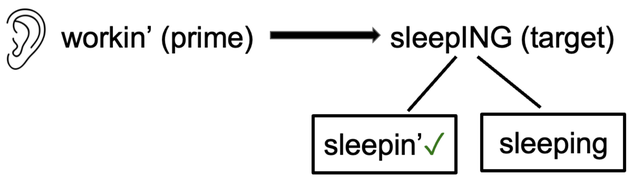
Which word have you heard?

beggin' begging

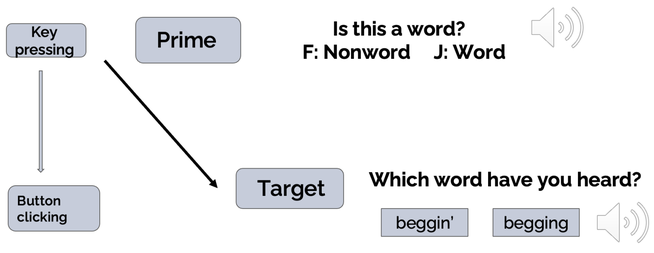
  - Baseline perception rate for these ambiguous items: 70%

Experiment 1

- **Goal: demonstrate variant priming in the lab**
- **Hypothesis**: hearing one variant of *-ing/-in*' would make listeners more likely to perceive the same variant when *next* given an ambiguous target for categorization [6].



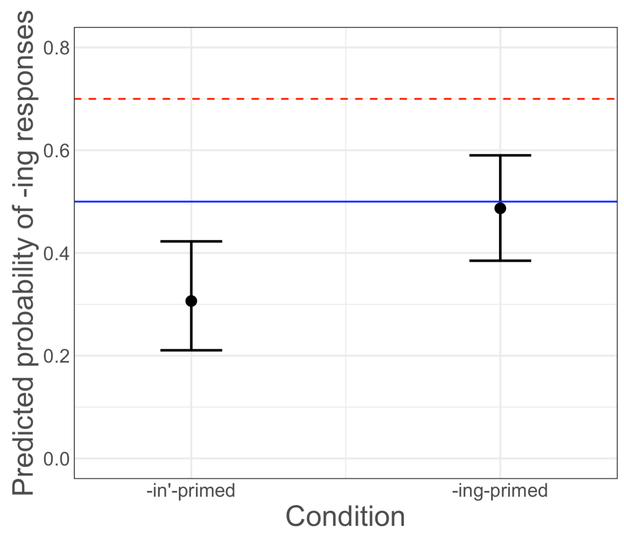
- **Procedure**: lexical decision + forced-choice categorization



- **Within-subject design with two critical prime conditions:**
  -in'-primed condition
  -ing-primed condition
- **Overall rates of the two variants were controlled**
- **38 ambiguous targets paired with 38 clear primes**
  - Primes and targets matched in lexical frequency
  - 200 filler trials of various types (sequences where targets after *-ing* or-*in'* did not have *-ing*/*-in'*)
  - Word-nonword ratio in lexical decision trials: 1:1
  - 4 lists were constructed to counterbalance the form of variants and the sequence of primes
- **Implemented online in PCIbex**
- **102 participants from Prolific (**self-reported monolingual American English speakers; age range: 17-50y**)**

- **Analysis: mixed-effects regression:**
perceived *-ing* ~ Prime condition * target frequency + trial number + (prime condition | participant)+ (1| target)

- **Results**:
  - Significant main effect of prime condition (β = 0.77, p < 0.001): participants were significantly more likely to categorize an ambiguous target as containing *-ing* when they had just heard an *-ing* variant on the previous trial.
  - No other predictors were statistically significant
  - Appearance of convergence toward local statistics



Experiment 2

- **Goal: demonstrate talker accent influences variant identification**
- **Hypothesis**: listeners would be more likely to perceive an ambiguous ING-suffixed word as *-in'*-containing, as opposed to *-ing*-containing, when the talker had a noticeable Southern US accent [7].
- A between-subjects design—participants were randomly assigned to one of the two critical conditions:
  - Southern accent condition
  - general accent condition
- **Stimuli**: 38 ambiguous targets from Experiment 1; produced by a bidialectal female speaker
- **102 participants from subject pool and Prolific**
- **Procedure**

Which word have you heard?

beggin' begging

- **Results**: Listeners were significantly more likely to identify ambiguous targets as containing the *-ing* variant in the general accent condition (β=1.30, p<.001)

Experiment 3

- **Goal: test whether variant priming is modulated by talker accent**
- **Hypothesis**: Based on the assumption that unexpectedness enhances priming, the priming effect might be weaker in the Southern accent condition, as the association between *–in'* and Southern speech could make *-in'* primes less surprising [8].
- **Mixed design**: two prime conditions were manipulated within subjects; talker accent was included as a between-subjects factor

- Same items produced by the same bidialectal speakers from Experiment 2 were used
- **155 participants** (general accent N = 83; Southern accent N = 72) from Prolific

- **Analysis: mixed-effects regression**
perceived *-ing* ~ Prime condition * talker accent + prime condition * target frequency + trial number + (prime condition | participant)+ (1| target)

- **Results**
  - Listeners on average were less likely to perceive –ing in ambiguous targets in the –in'-primed condition (β = -0.60, p<0.001)
  - Listeners were significantly more likely to perceive –ing when the talker was general-accented (β = 1.45, p<0.001)
  - The interaction between prime condition and talker accent was not significant (β =-0.24, p=0.16)

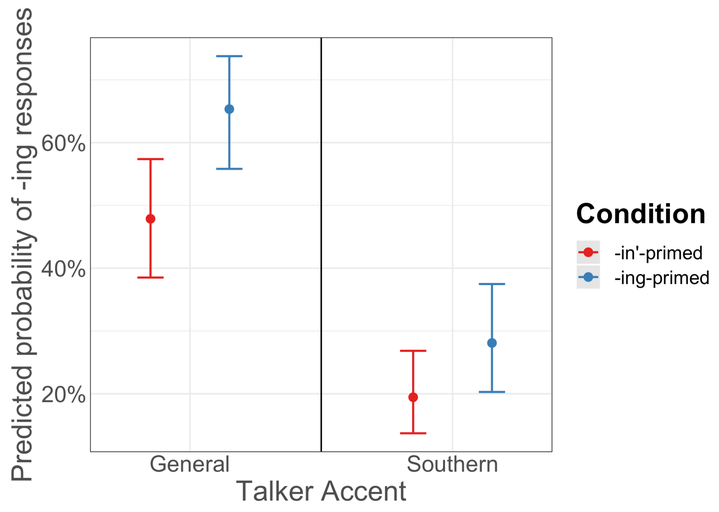


Figure 2: Results of Experiment 3

Discussion

Across three experiments, we have demonstrated that:

- In speech perception, discrete sociolinguistic **variants can be primed.**
- The difference between the two prime conditions cannot be attributed to convergence towards the talker's overall *-ing/-in*' rate
- Talker accent influences variant identification as well: listeners can use existing sociolinguistic knowledge in variant identification
- Our results fail to provide evidence for a possible interaction between variant priming and talker accent→ social unexpectedness may not modulate variant priming in the same way as linguistic unexpectedness.

References

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