

# Retuning generalizes to new contexts

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## Introduction

- Listeners systematically “retune” their categorical boundaries when presented with real-word tokens containing an ambiguous segment (McQueen et al. 2006; Norris et al. 2003).
- Reinisch et al. (2014) argued, using a *visually-guided* retuning paradigm, that retuning is specific to the context the retuning is learnt in.
- We show that a *lexically-guided* retuning effect is not context-specific as it generalizes to new contexts. This suggests that lexically-guided retuning also affects more abstract representations than simply acoustic cues.

## Pre-Experiment

- Two 41-step continua created to find most ambiguous token.
  - Evenly spaced 14 steps used for pre-experiment and the experiments.
  - Blended [f] and [s].
  - Experiment 1: spliced onto [i] vowel.
  - Experiment 2: spliced onto [a] vowel.
- 21 American English speakers.
  - Experiment 1: 13
  - Experiment 2: 8
- Forced choice task.
  - “f” or “s”.
  - Randomized presentation.
  - Each token played 4 times.

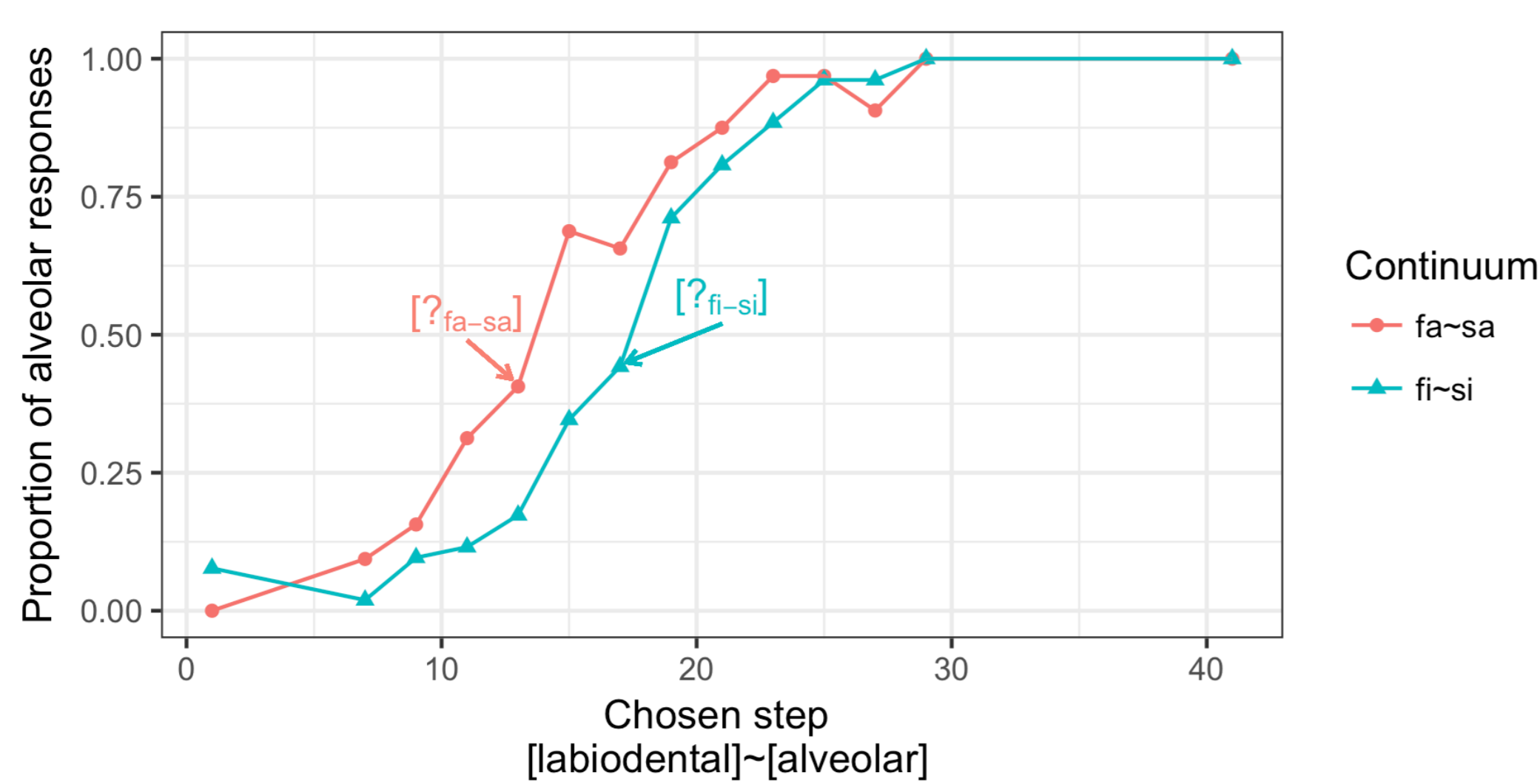


Figure 1: Results of pre-experiment categorization tasks

## General Experiment Design

- Three tasks.
- Tasks 1 & 3: Categorical tests (same as Pre-Experiment).
  - Experiment 1: [fi]~[si] continuum. (37 Participants)
  - Experiment 2: [fa]~[sa] continuum. (41 Participants)
- Task 2: Lexical Decision Task (LDT).
  - 150 Words Total.
  - 34 Critical Test Words (Containing [f] or [s]). Crucially, no minimal pair if replaced with the opposing segment.
  - Words containing [f] were replaced with [ʔ<sub>f</sub>] ambiguous token
  - 116 Filler Words (Containing no [f s v z]).
    - \* 41 English words.
    - \* 75 phonotactically licit English nonce words.
  - Were asked if the word they heard was a real English word.

## Experiment 1

### Stimuli

- 14-step continua of blended [f~s] segments spliced onto the onset of an [i] vowel.
- 34 English words containing [f] or [s] (17 of each; 9 in onset and 8 in coda).

## Results

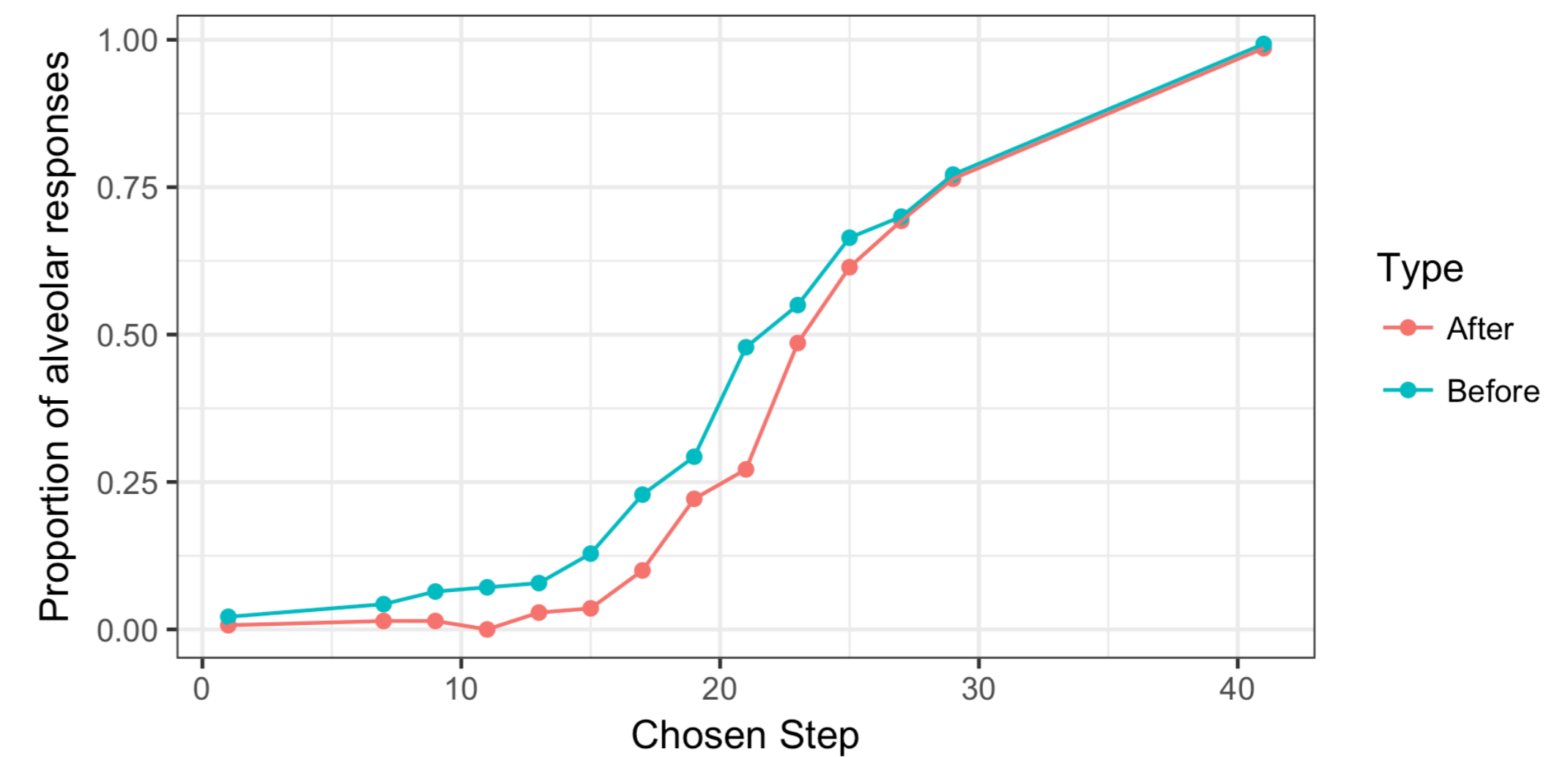


Figure 2: Proportion of “s” responses for [fi]~[si] continuum in Exp. 1.

All participants but two had more than 50% accuracy in the LDT. A one-tail paired Welch test comparing alveolar responses for the [fi]~[si] continuum showed that there was a significant overall decrease after LDT [t(34)=-3.8, p<0.001].

## Experiment 2

### Stimuli

- 14-step continua of blended [f~s] segments spliced onto the onset of an [a] vowel.
- 34 English words containing [f] or [s] and adjacent to either an [i or ɪ] vowel (17 of each; 13 in onset and 4 in coda).

## Results

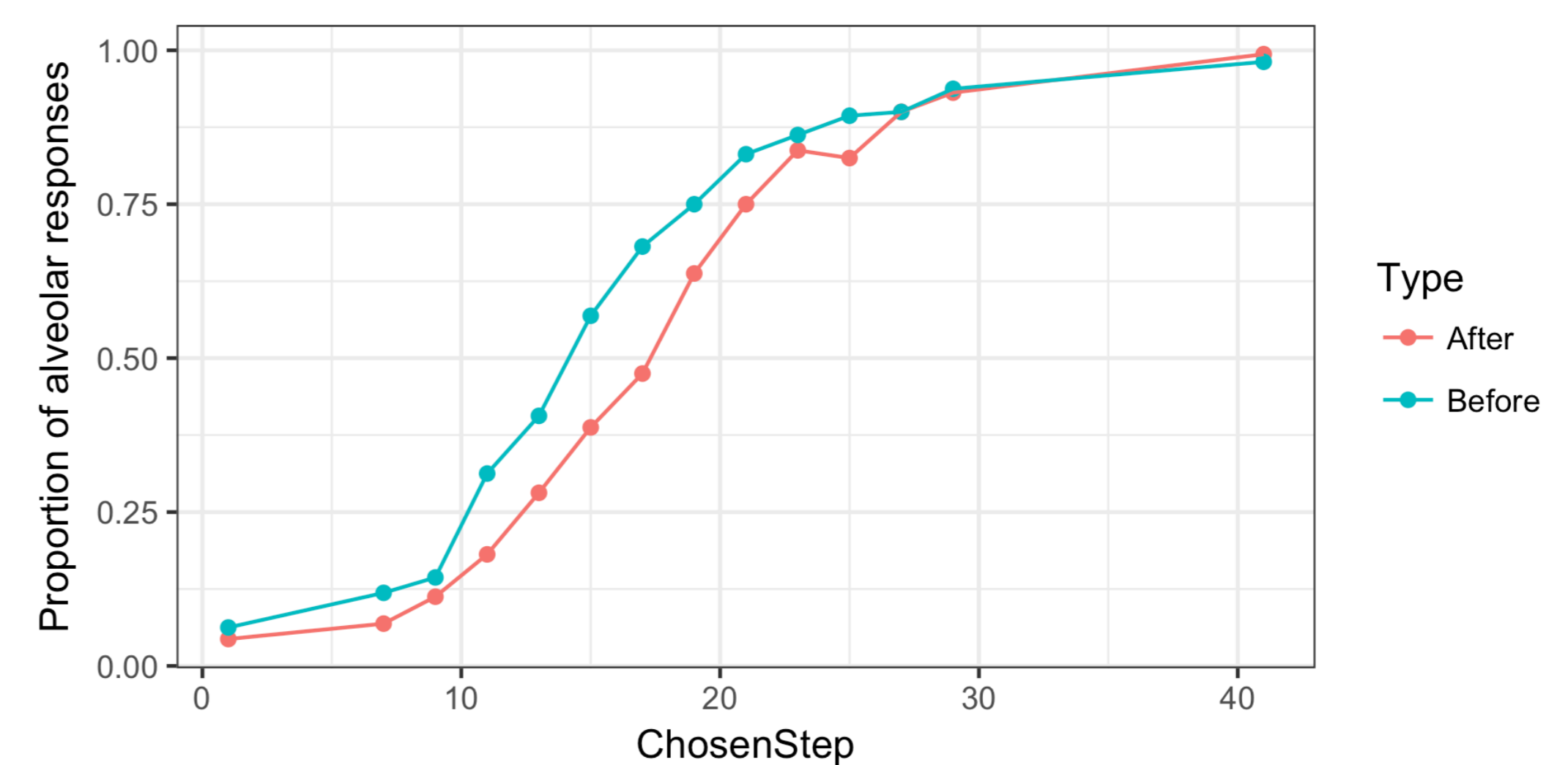


Figure 3: Proportion of “s” responses for [fa]~[sa] continuum in Exp. 2.

All participants but one had higher than 50% accuracy in the LDT. A one-tail paired Welch test comparing alveolar responses for the [fa]~[sa] continuum showed that there was an overall decrease after LDT, similar to Exp. 1 [t(39)=-5.51, p<0.001].

## Conclusions

- **Exp. 1:** change in alveolar “s” responses for the [fi]~[si] continuum due to retuning. This is a replication of previous results.
- **Exp. 2:** Replacement of the [f] segments with an ambiguous [ʔ<sub>f</sub>] during the LDT, where the crucial segment [f] was only in the context of [i or ɪ] also resulted in a similar decrease in the alveolar “s” responses for the [fa]~[sa] continuum.
- Therefore, phonetic retuning, when it involves lexical items, is not acoustic context-specific, and in fact generalises to novel contexts.

## References

- McQueen, James M., Anne Cutler, and Dennis Norris (2006). “Phonological abstraction in the mental lexicon.” *Cognitive Science* 30, pp. 1113–1126.
- Norris, Dennis, James M. McQueen, and Anne Cutler (2003). “Perceptual learning in speech.” *Cognitive Psychology* 30.2, pp. 1113–1126.
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