

A Brief Intervention to Help Listeners Process an Unfamiliar Non-Native Accent

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Communication in the global university

- In 2021, there were over 430,000 international students enrolled in graduate degree programs across the U.S. (Source: NCSES, 2022)
- 42% of undergraduates reported having dropped a class upon learning it would be taught by a non-native speaker of English (Rubin & Smith, 1990).

The communication problem

- Accents are resistant to change
 - After 2 years in the U.S., ITAs' pronunciation and fluency don't improve as much as do their vocabulary and syntax

(Hwang, Brennan, & Kim, in preparation)

- However, communication is collaborative.
- This suggests that we should try to address the communication problem at the undergraduate level—**how can we train listeners to adapt to non-native accents?**

Adapting to foreign-accented speech

- Native English speakers often have difficulty processing non-native accents, which can hinder comprehension

(Floccia et al., 2009; Major et al., 2002; Munro & Derwing, 1995)

- Comprehension of foreign/regional accented speech can improve over time. Listeners benefit from exposure to:

- a **specific talker** (when they hear the same talker later)
- **multiple talkers** if they are exposed to a different talker later
- **multiple accents** when exposed to a different accent later

(Baese-Berk, Bradlow & Wright, 2013; Bradlow & Bent, 2003; Bradlow & Bent, 2008)

- Adaptation can occur rapidly *(Clarke & Garrett, 2004)*.

The task

- Goal: Use a task similar to the experience of a student listening to a TA give a lecture
 - Many previous studies have used single words or short, simple sentences as stimuli
 - We used meaningful stories as our stimuli
- Goal: Use an *online measure* of comprehension
- Previous studies have often used “off-line” tasks that measure end-state comprehension (e.g., transcribing speech after it is heard)
- We decided to use ***shadowing*** as an online measure

The current studies

- As an index of online comprehension, we measured shadowing performance by calculating % words omitted or misheard.

We predicted that shadowing performance on new, previously unheard stories would improve over the course of the experiment.

Stimuli

- 12 short stories read by the same Mandarin-accented ITA
- Each contained multiple instances of these characteristics typical of Mandarin-accented English:

Story 1: The Rabbit's Thesis

It's a fine sunny day in the forest. A rabbit is sitting on a log outside her hole, thinking and typing on her laptop. Along comes a fox, out for a walk.

The fox says, "What are you working on?" The rabbit replies, "My thesis." Surprised, the fox says, "What's it about?" The rabbit says proudly, "Oh, it's really good! It's called "The Superiority of Rabbits over Foxes and Vultures."

The fox scolds the rabbit. "That's absolutely ridiculous! Any fool knows that foxes and vultures are superior to rabbits." But the rabbit says, "Come with me to my lab and I'll show you!"

They both disappear into the rabbit's hole. After a few minutes, the rabbit comes out alone, returns to her laptop, and resumes typing.

Soon a vulture comes along and stops to watch the hard-working rabbit. "What are you writing?" she asks.

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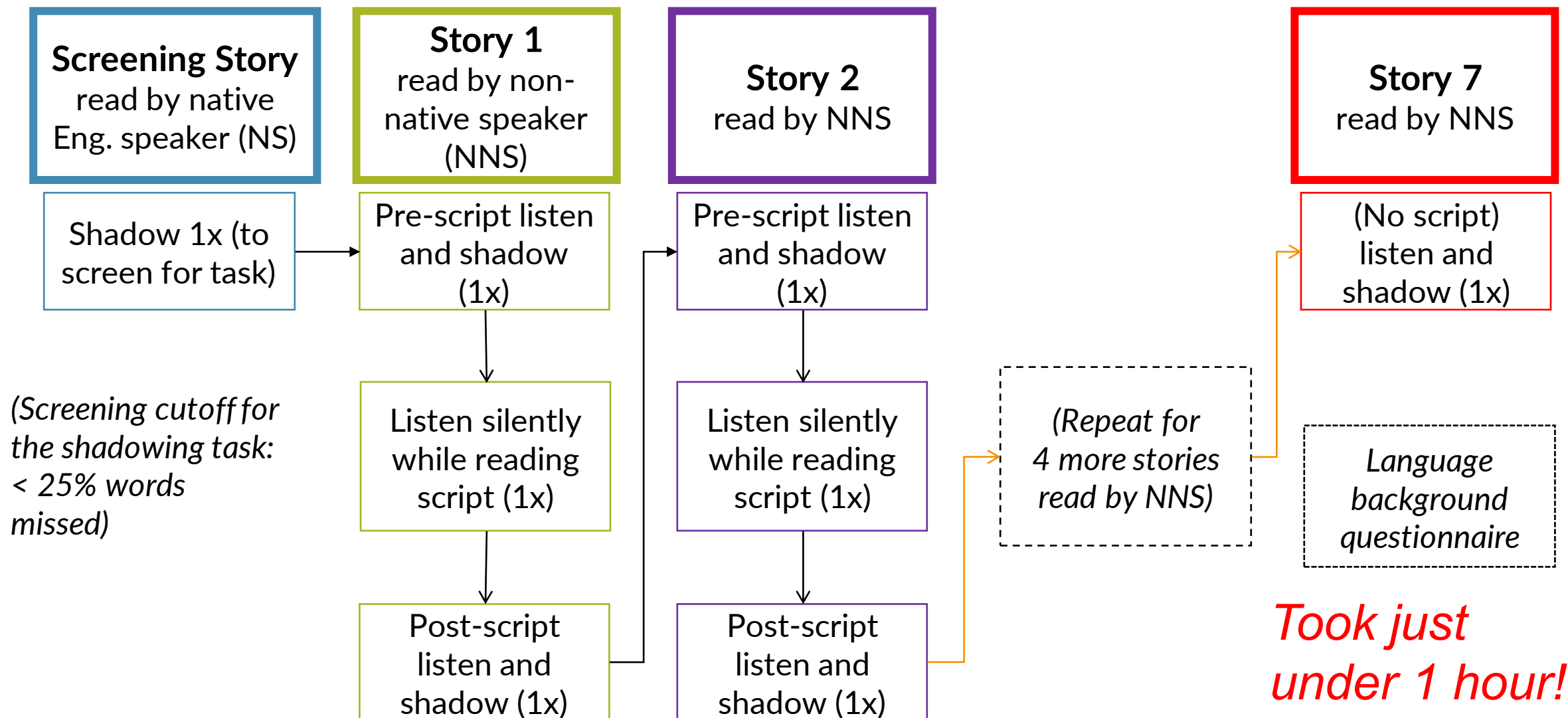
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Structure of the intervention *(from Charoy et al., 2019)*

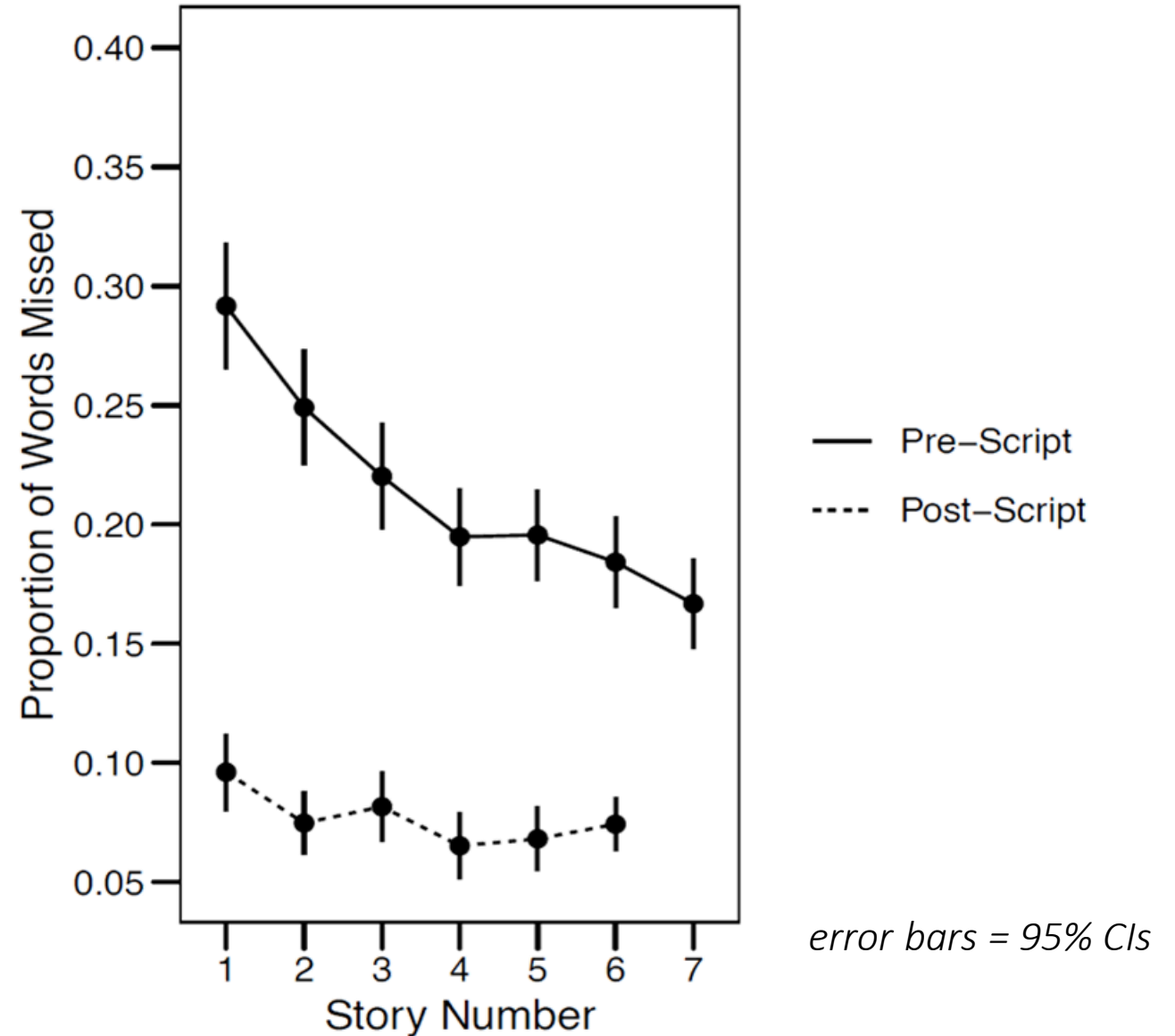


Results *(from Charoy et al., 2019)*

N = 50 native-English-speaking Stony Brook undergraduates

Does this adaptation effect replicate?

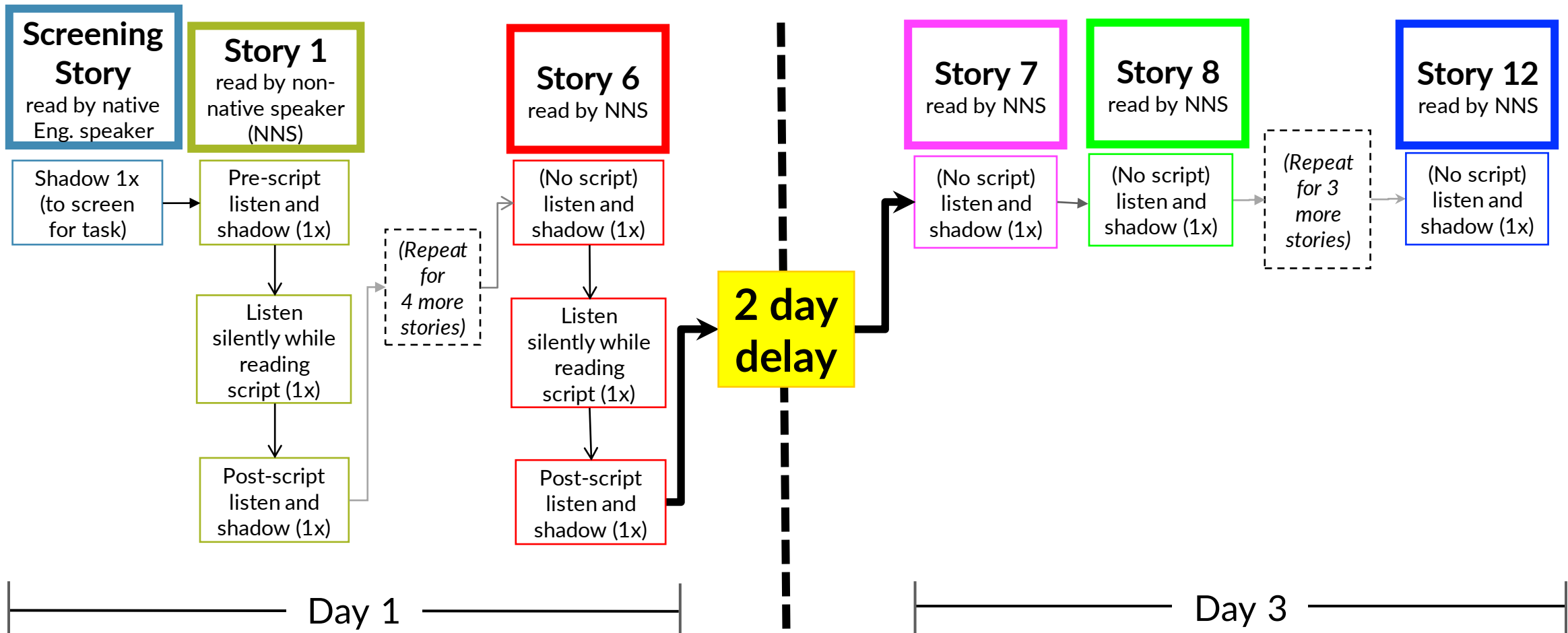
Does it last?



Return to the lab after a two-day delay

(Same procedure as Study 1, but with one fewer story)

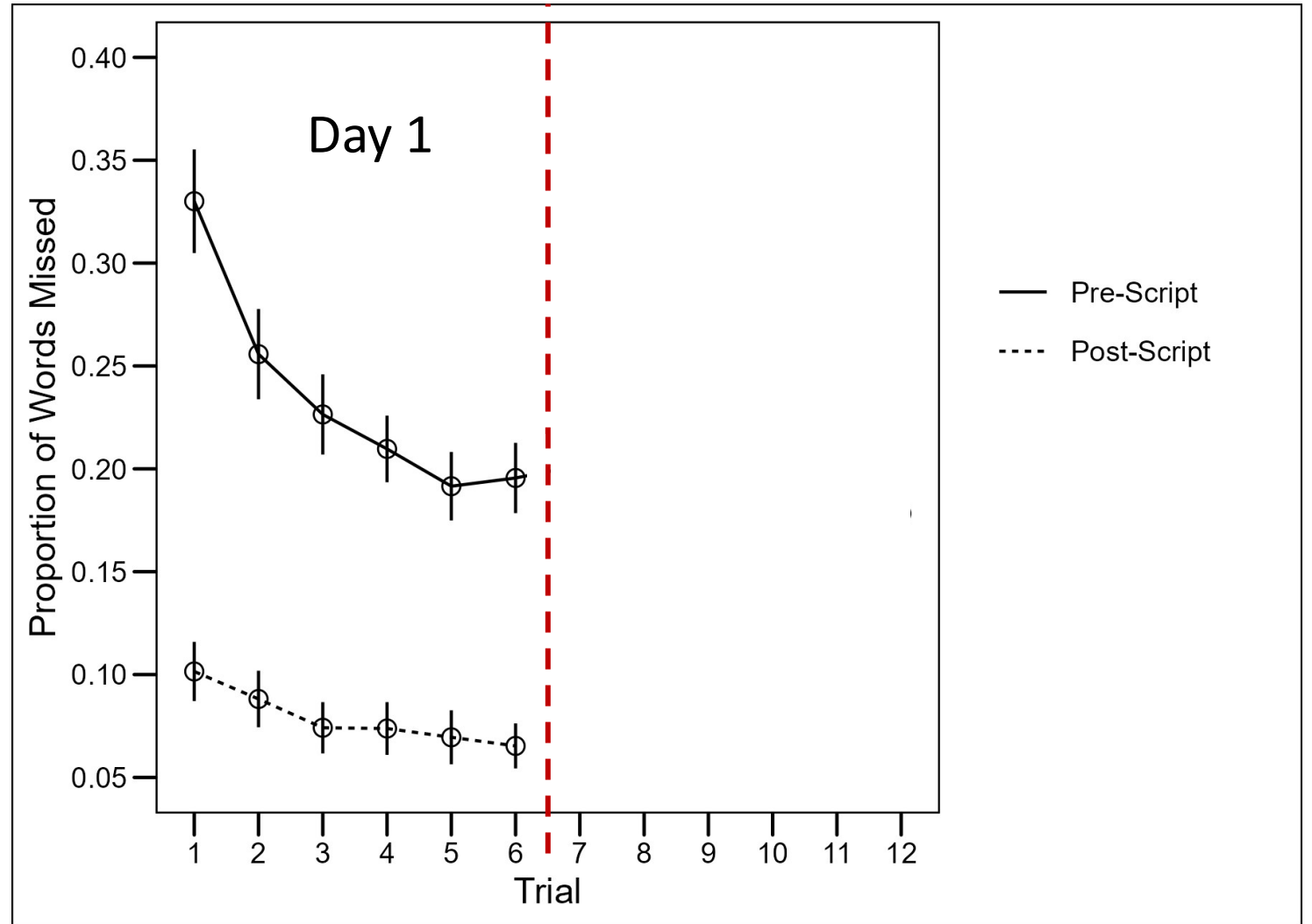
(New stories, no repeated listening or script)



Return to the lab after a two-day delay: **Results**

N = 59 native-English-speaking Stony Brook undergraduates

Study 1 replicated.



error bars = 95% CIs

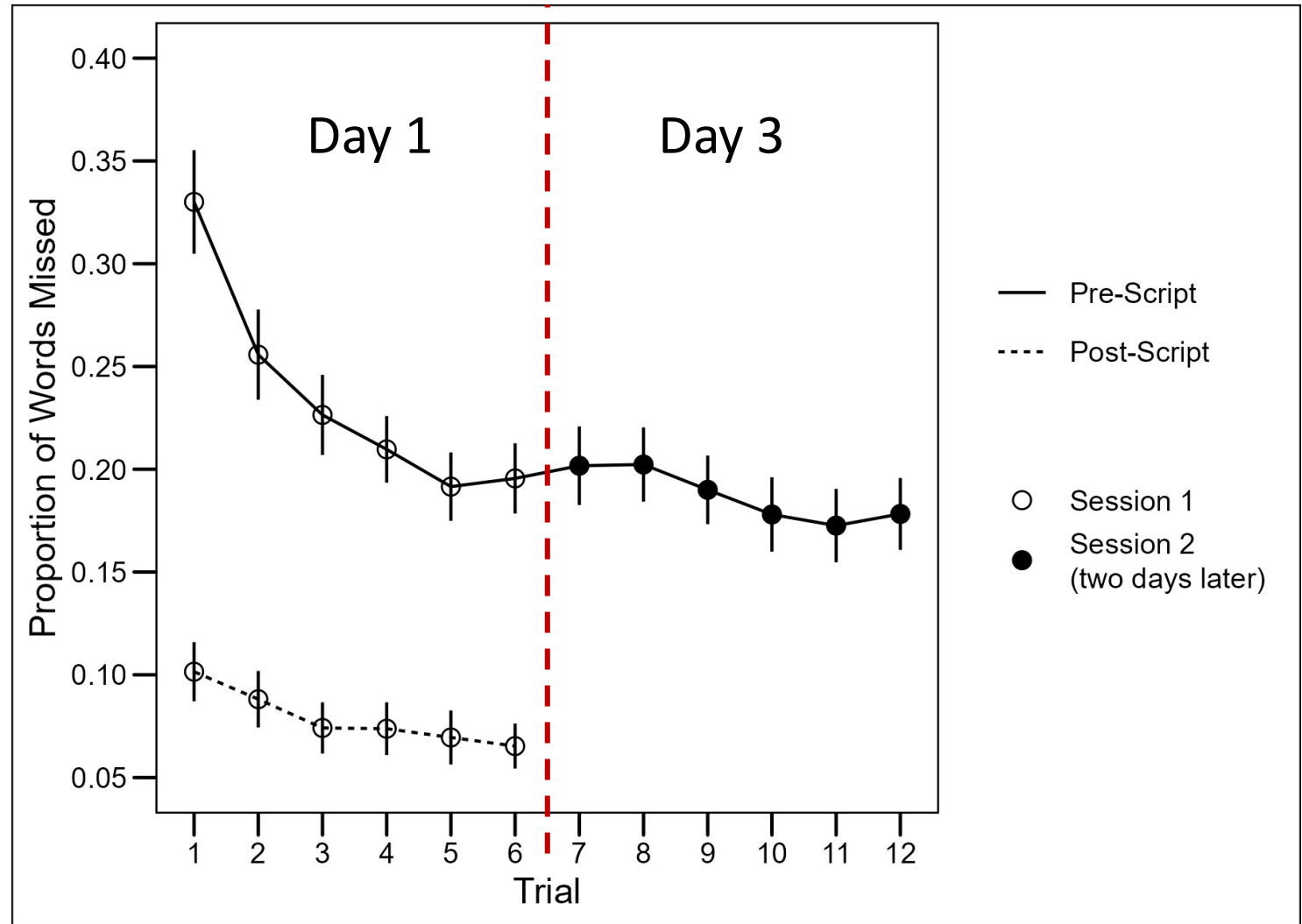
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Study 1 replicated.

The adaptation effect persists. On Day 3, listeners picked up where they left off.

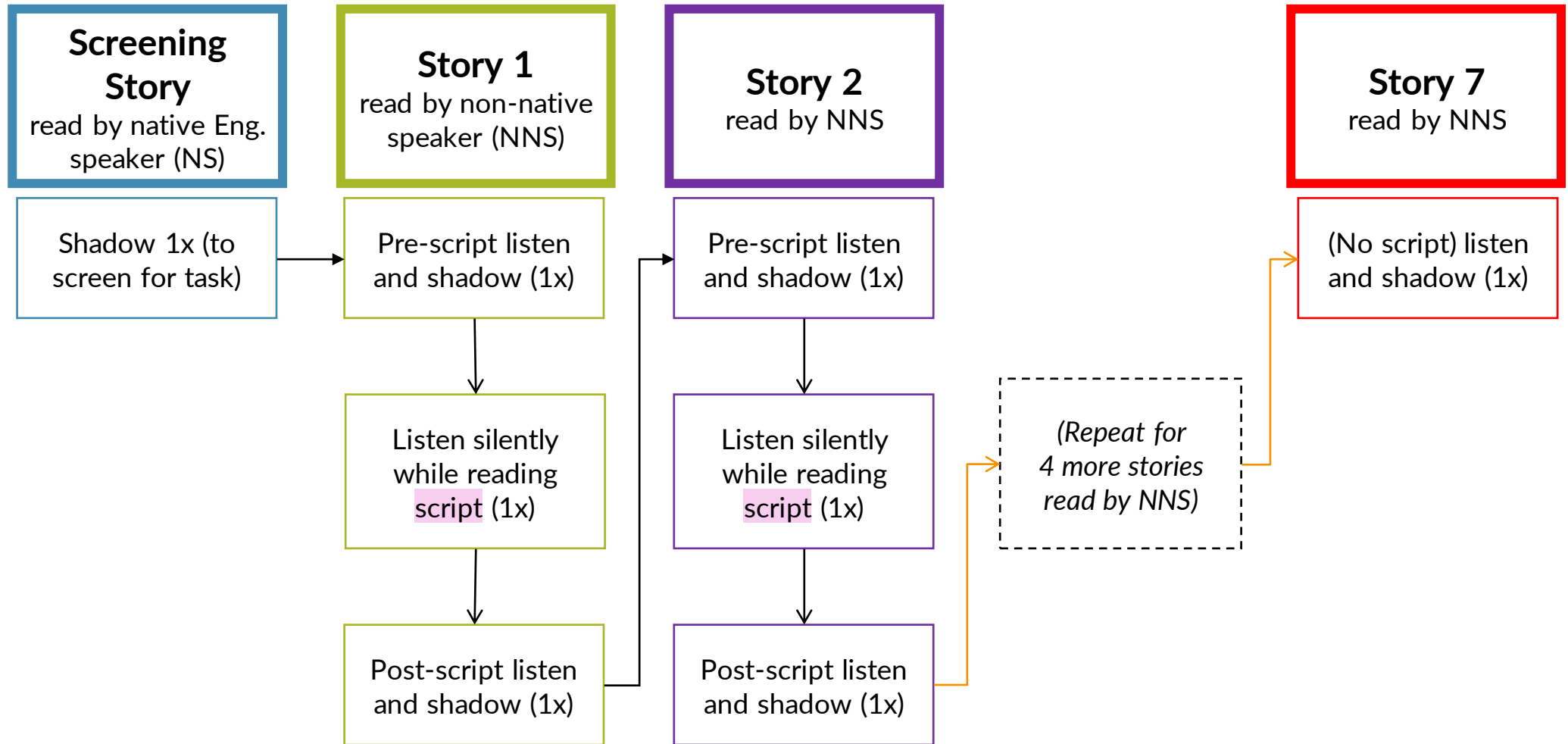
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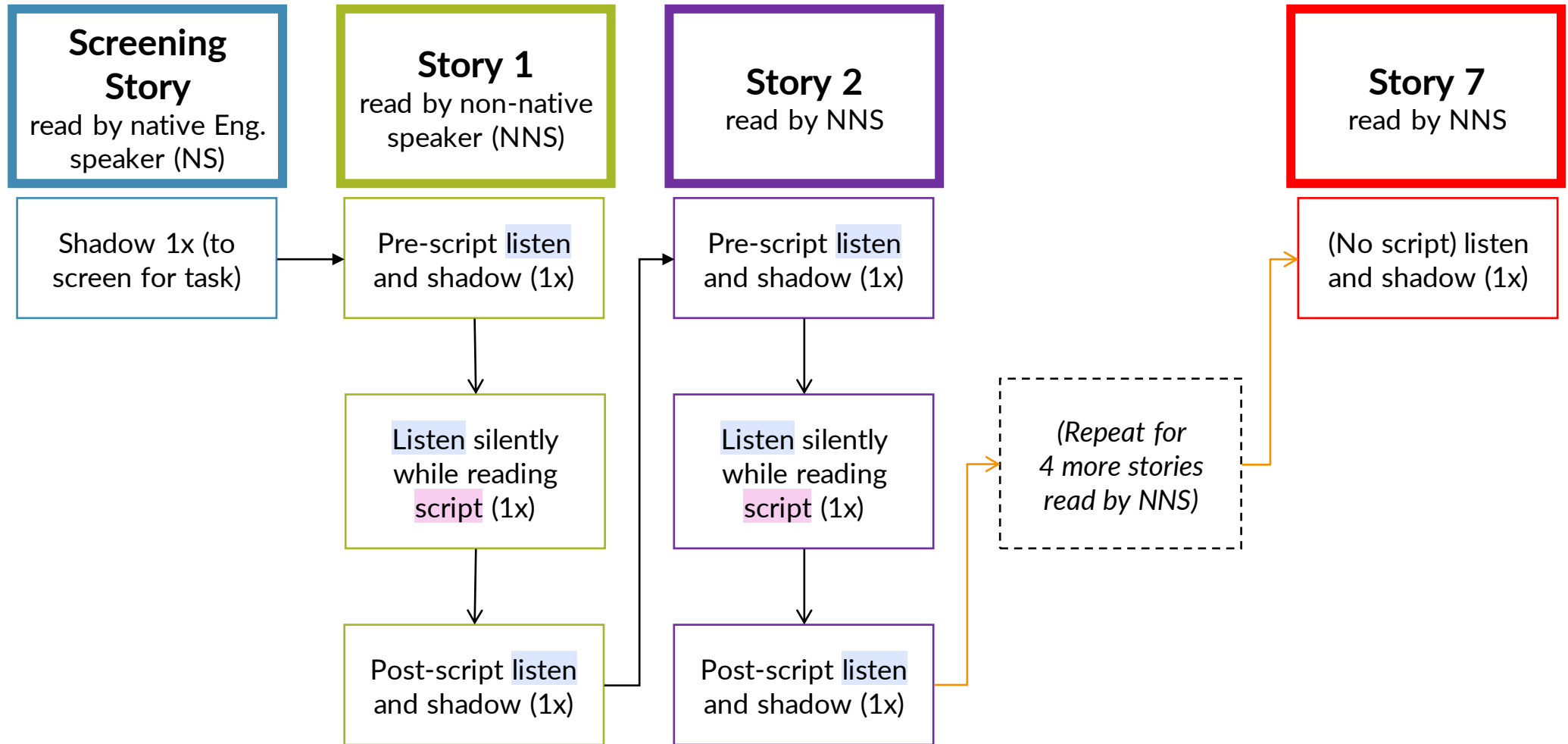
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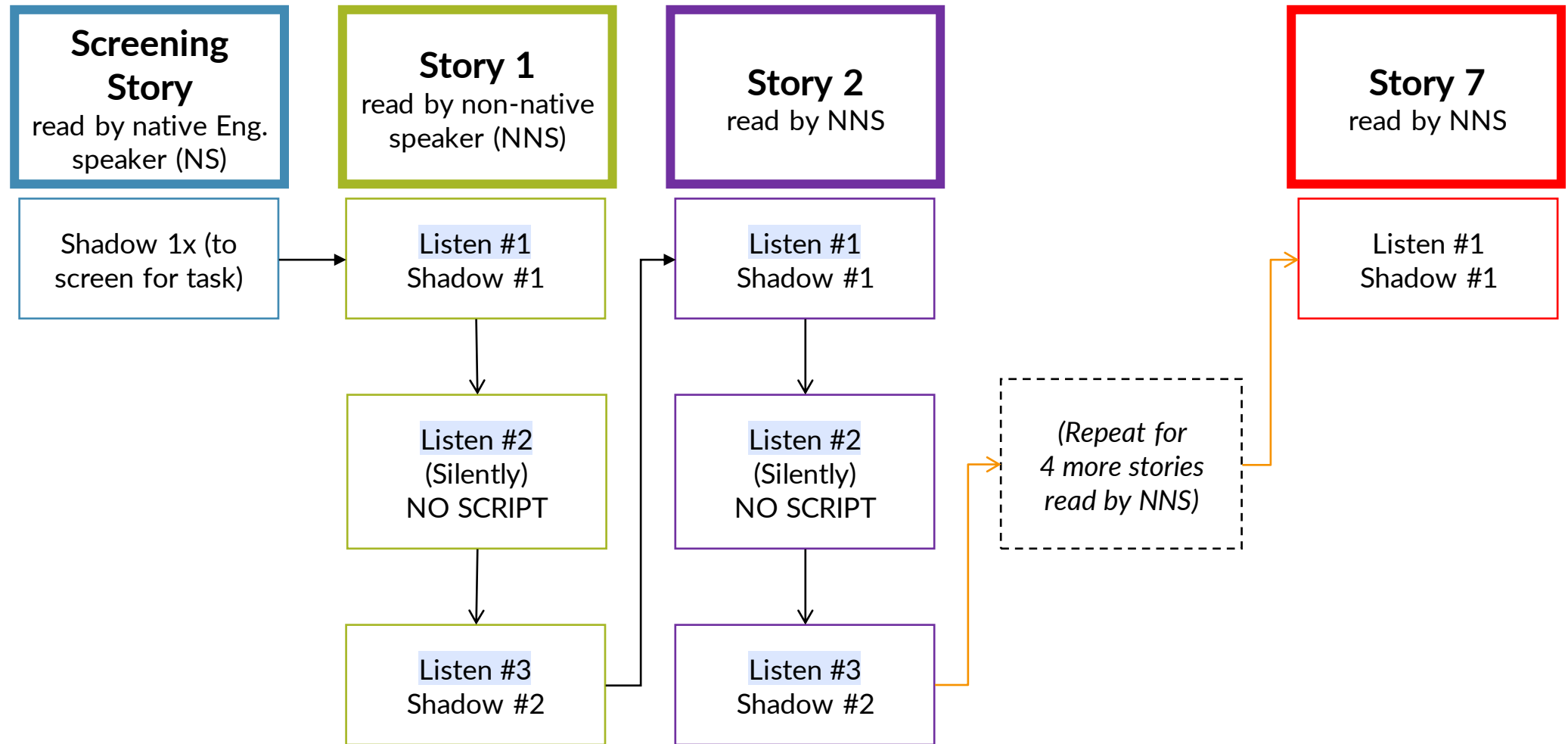
The script?

Repeated listening?



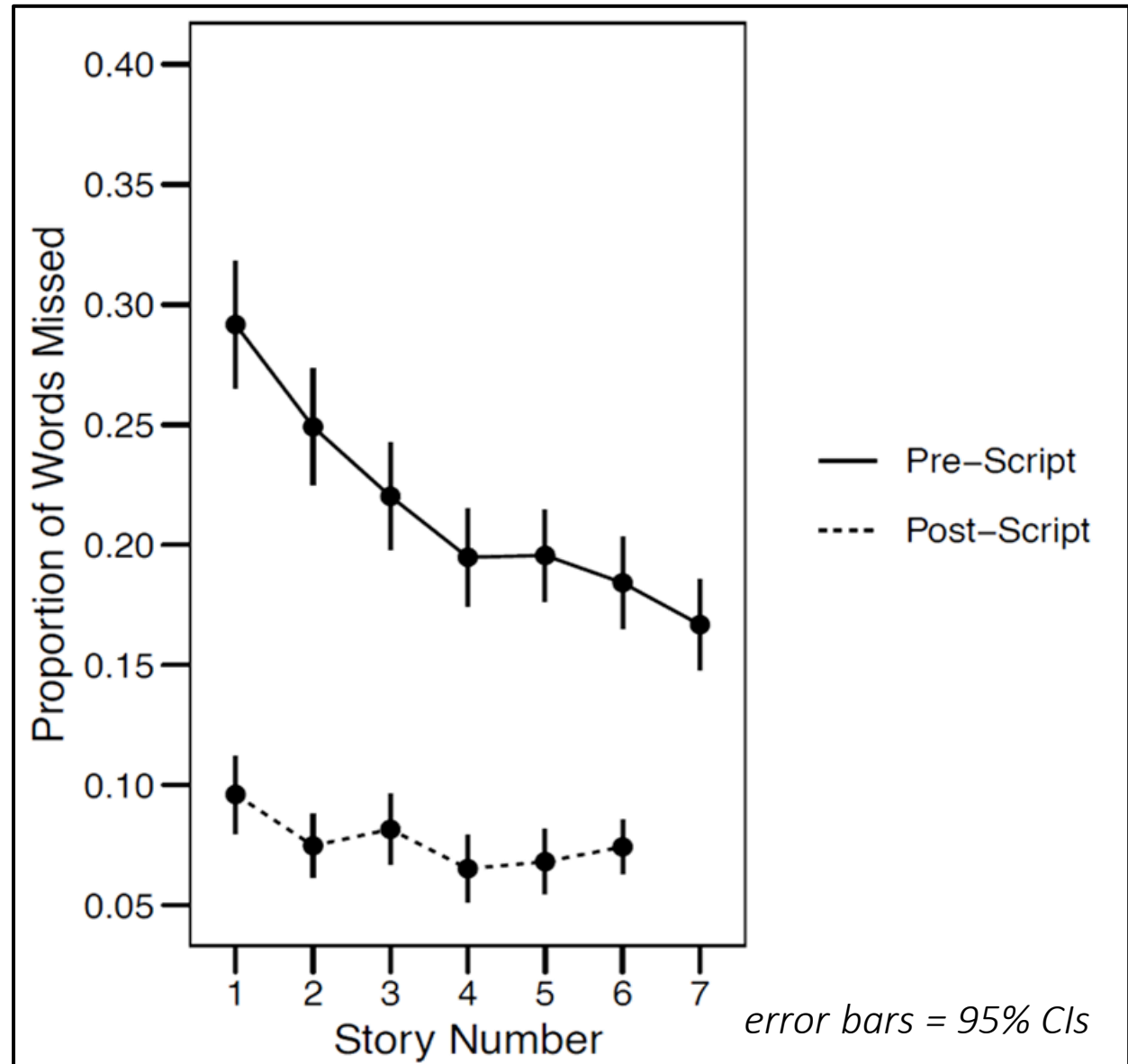
Study 3: *Attempt to make the effect go away*

No script intervention; listen 3x, shadow 2x



Attempt to make the effect go away: **Results**

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Attempt to make the effect go away: Results

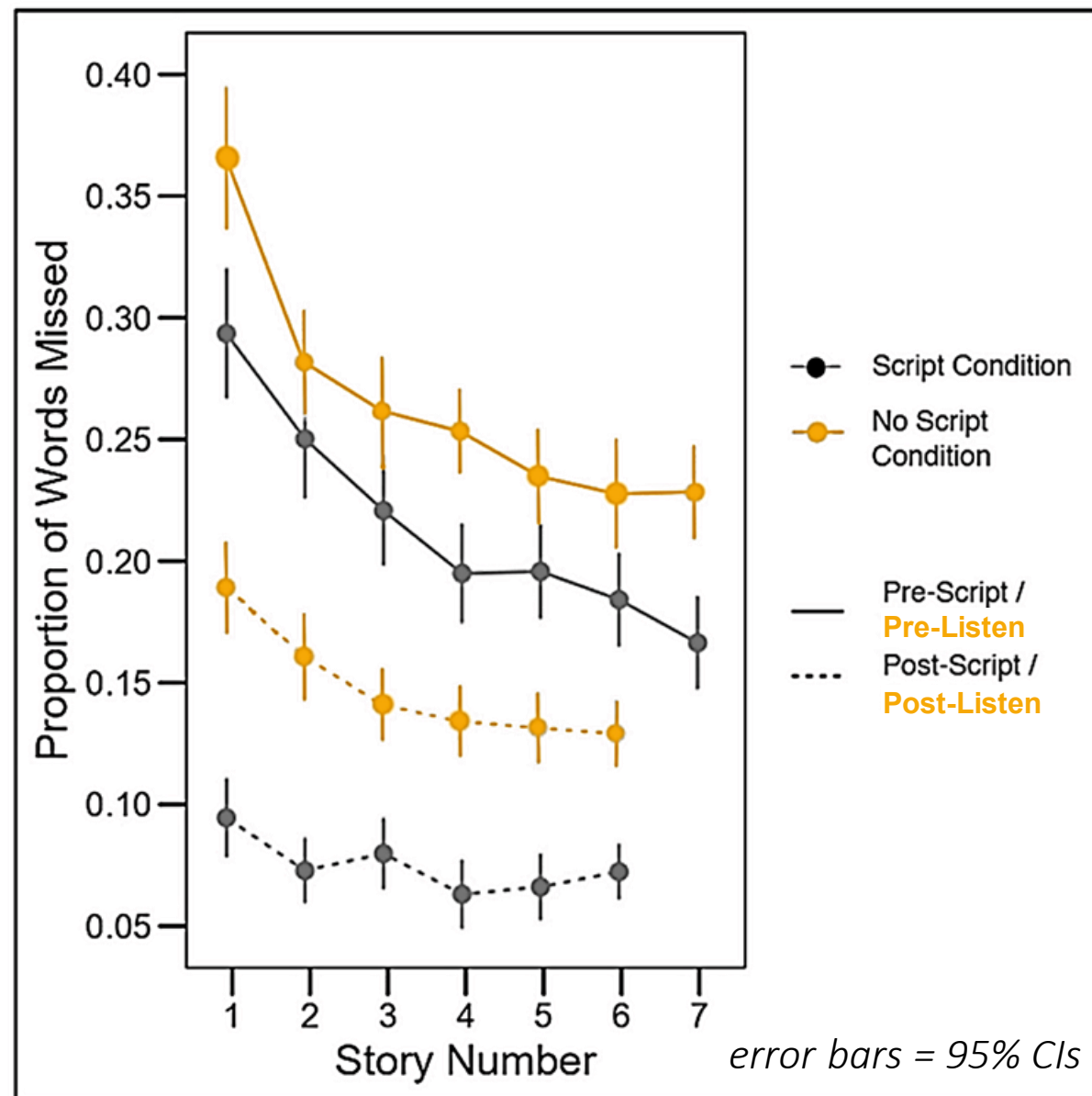
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The adaptation effect is still present, but more words are missed overall.

When listeners shadow a previously heard story, having seen the script *does* appear to make a difference.

So, the adaptation effect appears to be due to multiple factors.



Future directions

- Tease apart impacts of repeated listening from shadowing.
- Replicate the effect with a 2nd Mandarin speaker.
- Does adaptation to one speaker's Mandarin English accent transfer to another?
- Conduct a more nuanced analysis of impostor words (and eventually a controlled test of word monitoring for imposters).

Conclusions

- Rather than expecting foreign accents to change, it seems more promising to empower listeners to adapt to foreign-accented speech.
- A short intervention can improve missed words during shadowing Mandarin-accented English by ~40%.
- This adaptation lasts for at least 2 days.
- The adaptation effect is only partially driven by seeing a script; it may also be due to repeated listening.

Thank you!

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