

# Using an Oral Repetition Task to Develop Fluent Second Language Speaking Skills

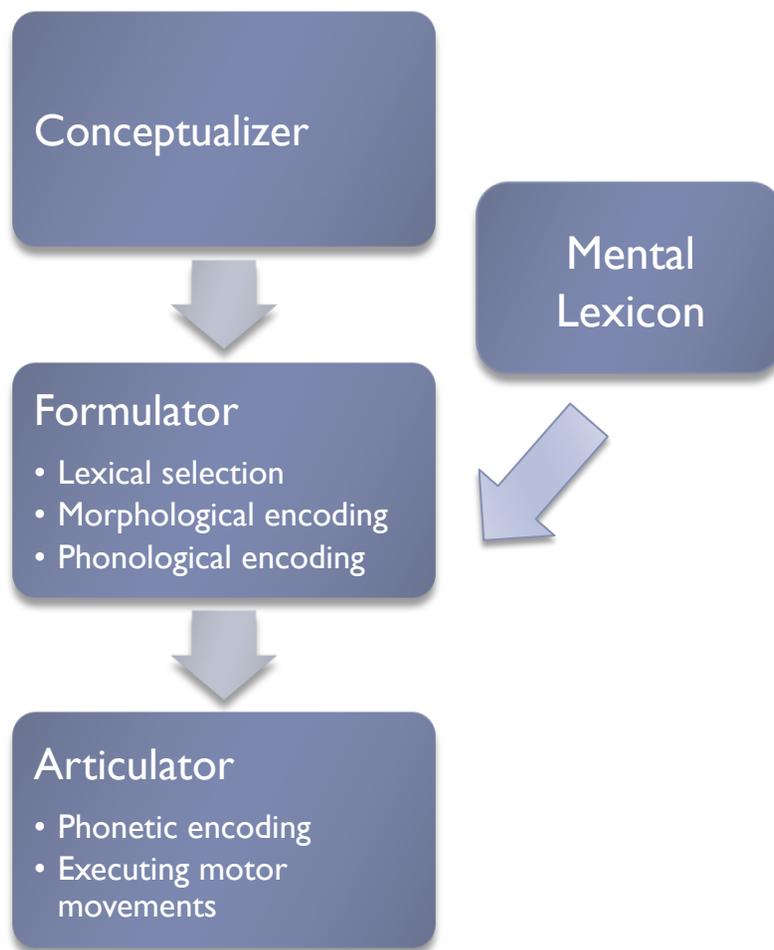
Colleen Davy  
Carnegie Mellon University

# Models of Language Production

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## ▶ Levelt's Speaking Model (1999)

- ▶ Three modules: conceptualizer, formulator, articulator
- ▶ Modules work serially
- ▶ BUT, multiple processes can happen in parallel
  - ▶ Allows for concurrent production & processing
  - ▶ Leads to non-choppy, fluent speech



# Models of Language Production

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- ▶ **Limitations of L2 Speech Production (Kormos)**
  - ▶ Incomplete knowledge of L2
  - ▶ Interference from L1
  - ▶ Reliance on declarative knowledge (increased need for controlled processing)
- ▶ **Increased controlled processing leads to lack of concurrent processing & production, dysfluencies.**



# Skill Acquisition

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- ▶ Practice leads to proceduralization!
- ▶ ACT-R
  - ▶ Tasks start out mostly relying on declarative knowledge
  - ▶ Multiple repetitions allow
    - ▶ Faster retrieval of declarative knowledge
    - ▶ Creation of procedures to execute function (require less controlled processing than declarative knowledge)
    - ▶ Combining/refining of multiple procedures

# Chunking and Proceduralization

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- ▶ Use of proceduralized chunks leads to more fluent speech
  - ▶ Using FS's → Lower cognitive load → more concurrent planning → more fluent speech
- ▶ What can we train?
  - ▶ Lexical retrieval (Snellings, 2002; 2004)
  - ▶ Morphosyntax?
  - ▶ Sentence structures?
- ▶ What is actually being trained?
  - ▶ Faster retrieval of declarative knowledge?
  - ▶ Creation of procedures?
- ▶ How do we train it?



# Training for Fluent Speech

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- ▶ Repetitive practice aids in proceduralization of forms (Fluency Study!)
  - ▶ Levelt/Kormos model: More proceduralization --> lower cognitive load --> more parallel processing --> increased fluency
- ▶ Open-ended tasks more realistic, but don't guarantee that students will use difficult forms
- ▶ Yoshimura & MacWhinney (2007)
  - ▶ repetitive oral production of sentences led to improvements in temporal measures of fluency
- ▶ Repetition of incorrect forms may lead to fossilization

# Elicited Imitation Task as Practice

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- ▶ **Oral Repetition: Listen and Repeat**
- ▶ **Considered to be a reconstructive (rather than echoic) task (Erlam, 2006)**
  - ▶ In order for speaker to imitate the structure, it must exist in his/her interlanguage system
  - ▶ WM constraints
  - ▶ El of ungrammatical sentences leads to spontaneous correction in native speakers
- ▶ **Fluent native speaker model between speaking trials may:**
  - ▶ Encourage focus on fluency, rather than accuracy
  - ▶ Provide implicit feedback

# Second Year Project

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- ▶ Investigate oral repetition task as practice method
- ▶ Compare practice in phrases versus full sentences
  - ▶ Students in pilot study struggled with longer sentences
  - ▶ Research on training for fluency (Bucklin et al., 1996) suggests that training to fluency on component skills leads to better performance on complex tasks involving those skills later on.
  - ▶ Smaller pieces may lead to more successful creation of chunks



## Stimuli- Preterite/Imperfect

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- ▶ *Ayer/De joven yo **limpié/limpiaba** los platos y ellos*  
*Yesterday/As a child I washed (pret)/(imp) the dishes and they*  
***cocinaron/cocinaban** la cena*  
*cooked (pret)/(imp) dinner*

- ▶ Involves choosing verb type (Ayer yo limpié vs. De joven yo limpiaba)
- ▶ Simple: one verb type (preterite OR imperfect)
- ▶ Long; average 20.9 syllables/sentence

# Stimuli- Subjunctive

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- *Yo aconsejo que tu **limpies** los platos*  
I suggest that you wash the dishes
  - ▶ Does NOT involve choosing verb tense
  - ▶ Complex: two verb types: indicative (aconsejo) and subjunctive (limpies)
  - ▶ Short: average 13.7 syllables/sentence

# Procedure

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## ▶ Session I

### ▶ Training Phase:

- ▶ Participant sees picture(s) and hears phrase
- ▶ Participant repeats phrase
- ▶ Repeat x2

Training Procedure		
	Group I	Group2
Subjunctive I	14 Phrases	7 Sentences
PretImp I	7 Sentences	14 Phrases
Subjunctive2	14 Phrases	7 Sentences
PretImp2	7 Sentences	14 Phrases
Subjunctive3	14 Phrases	7 Sentences
PretImp3	7 Sentences	14 Phrases

## Example- Subjunctive Sentences

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sugerir

“El sugiere que el cocine la cena.”

## Example- Subjunctive Phrases

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sugerir

“El sugiere que”

# Example- Subjunctive Phrases

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“que el cocine la cena.”

# Procedure

## ▶ Session 1

### ▶ Training Phase:

- ▶ Participant sees picture(s) and hears phrase
- ▶ Participant repeats phrase
- ▶ Repeat x2

### ▶ Test Phase:

- ▶ 42 sentences; 21 from training phase
- ▶ See pictures and create sentence

## ▶ Session 2 (1 week later)

- ▶ Delayed Post-test
- ▶ Questionnaire

Training Procedure		
	Group 1	Group 2
Subjunctive 1	14 Phrases	7 Sentences
PretImp 1	7 Sentences	14 Phrases
Subjunctive 2	14 Phrases	7 Sentences
PretImp 2	7 Sentences	14 Phrases
Subjunctive 3	14 Phrases	7 Sentences
PretImp 3	9 Sentences	18 Phrases

# Participants

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- ▶ **16 Participants**

- ▶ All but 3 currently enrolled in Intermediate Spanish 1 or 2 (3<sup>rd</sup> or 4<sup>th</sup> semester) at Pitt and CMU; others enrolled in higher-level electives at CMU
- ▶ 9 in Group 1, 7 in Group 2

# Main Project Questions/Hypotheses

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- ▶ *Training*

- ▶ Does one type of training promote more native-like speech production, or more improvement across training?

- ▶ *Test*

- ▶ Does one type of training lead to more fluent speech production of test sentences?

- ▶ *Long-Term Effects*

- ▶ Does training lead to long-lasting improvements in speech production?

- ▶ *Generalizeability*

- ▶ Is training helpful even for novel sentences?

# Analyses

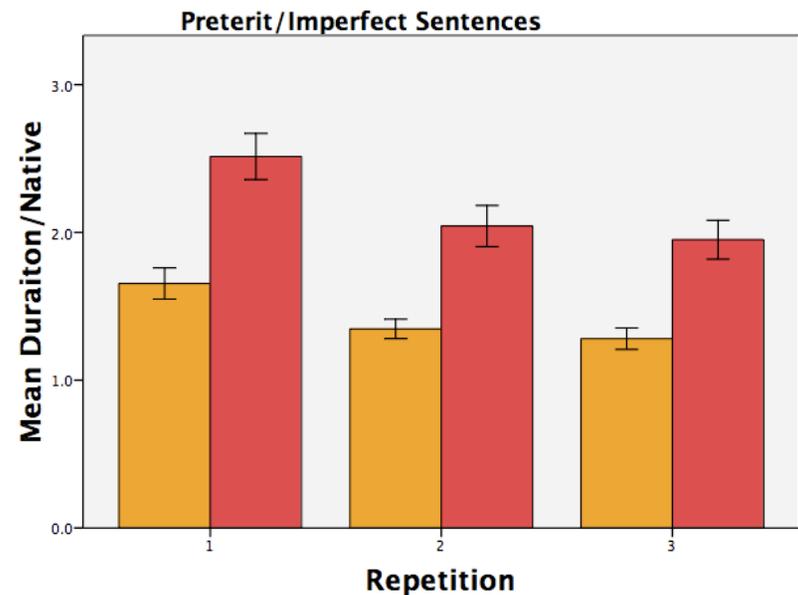
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- ▶ Training and Test phases transcribed using Praat speech analysis software and converted to Excel
- ▶ Temporal Measures:
  - ▶ Initial Pause
  - ▶ Mean Duration of Utterance (MDU) (for training, this is normalized – learner duration/native speaker duration (closer to 1 more native-like))
- ▶ Transcriptions coded for grammatical errors, corrections, repetitions, completeness
- ▶ Analyses compare across conditions for each sentence construction (Subjunctive & Preterit/Imperfect)

# Results- Training

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- ▶ **Preterit/Imperfect Sentences**
  - ▶ Significant improvement with each repetition
  - ▶ Greater improvement for sentence condition
  - ▶ Shorter Initial Pause with each repetition



Legend

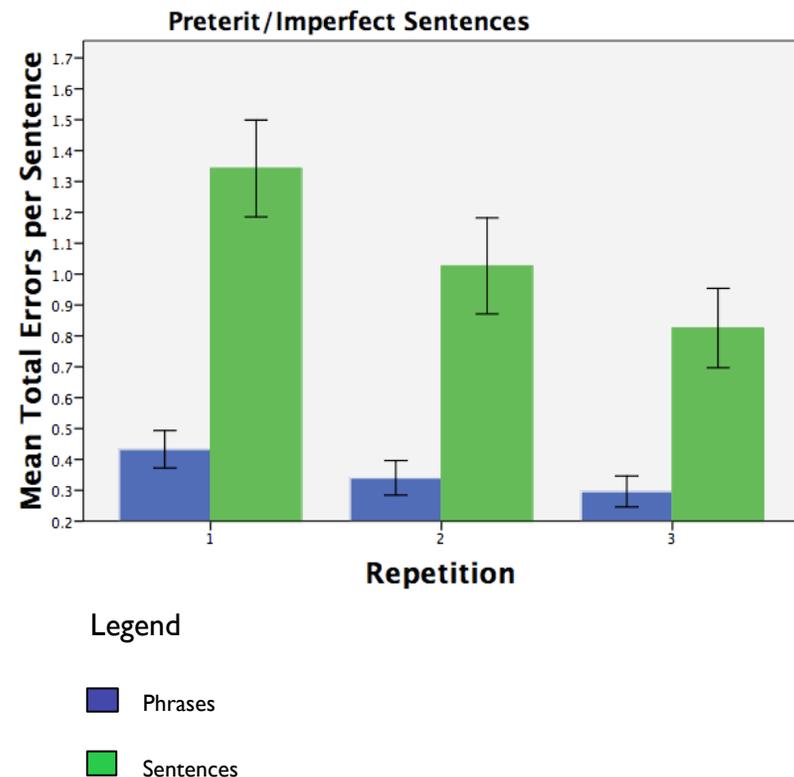
■ Phrases

■ Sentences

# Results- Training

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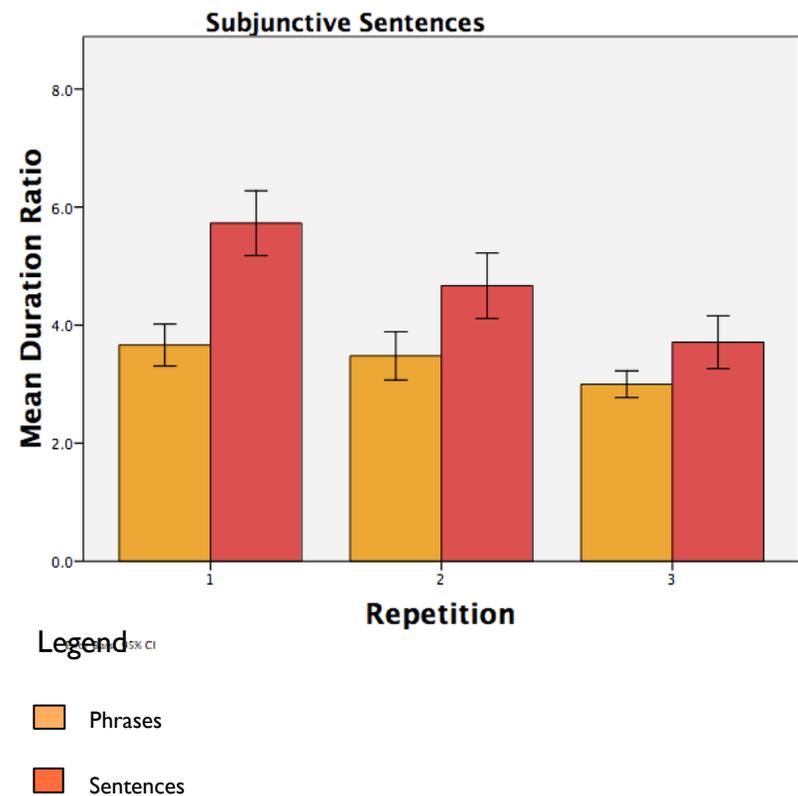
- ▶ **Preterit/Imperfect Sentences**
  - ▶ Significant improvement with each repetition
  - ▶ Greater improvement for sentence condition
  - ▶ Shorter Initial Pause with each repetition
  - ▶ Fewer errors per sentence with each repetition



# Results-Training

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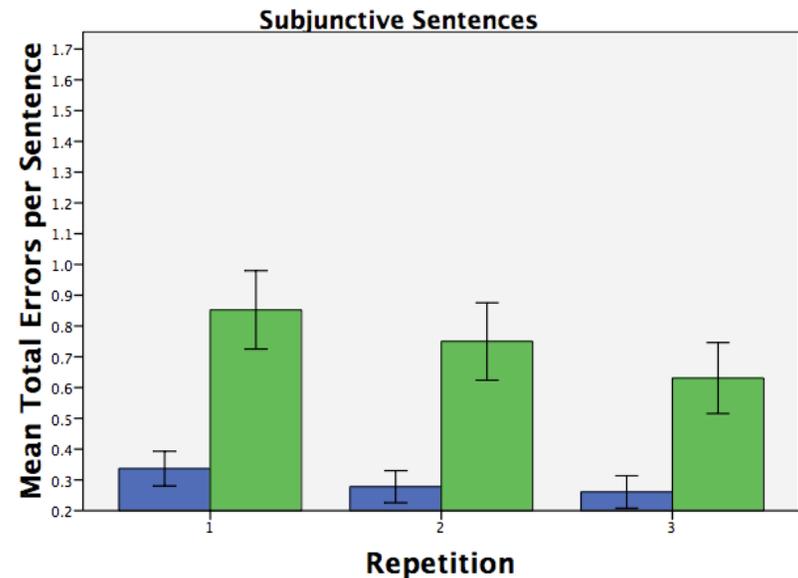
- ▶ **Subjunctive**
  - ▶ Improvement with each repetition
  - ▶ Phrase condition shorter overall



# Results-Training

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- ▶ **Subjunctive**
  - ▶ Improvement with each repetition
  - ▶ Phrase condition shorter overall
  - ▶ Very few errors in Phrase condition
  - ▶ Significantly fewer errors with each repetition



Legend

- Phrases
- Sentences

# Results- Test

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## ▶ Preterit/Imperfect

- ▶ *Mean duration of utterance:*  
Conditions equal at immediate test; Phrase condition significantly worse at delayed test



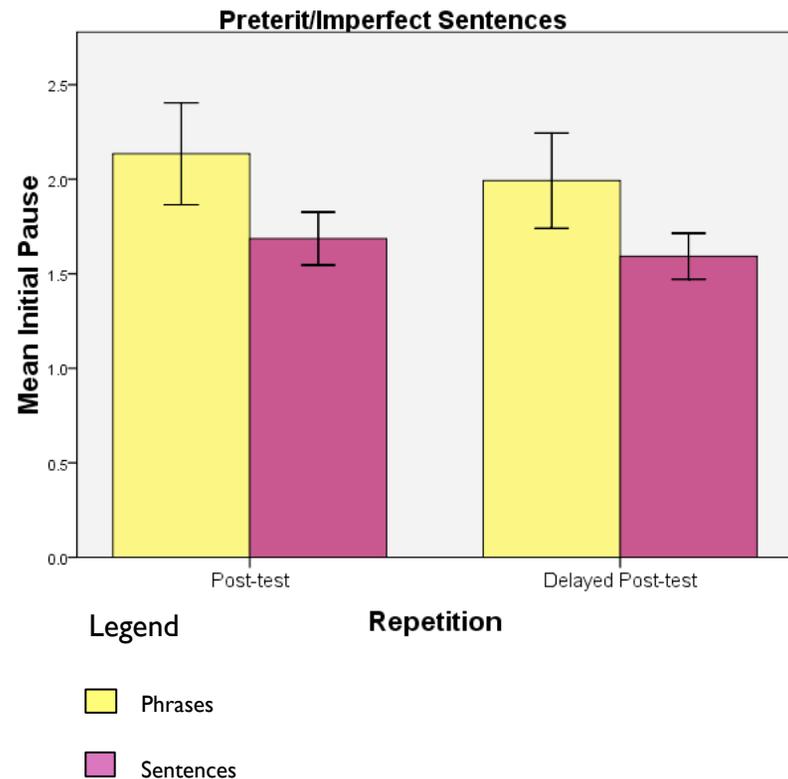
### Legend

- Phrases
- Sentences

# Results- Test

## ▶ Preterit/Imperfect

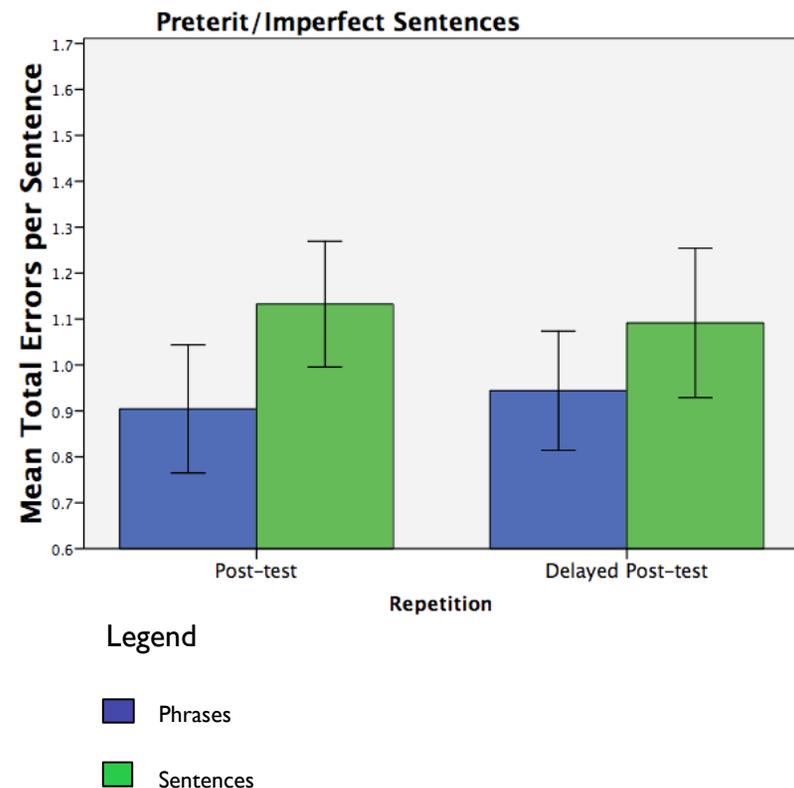
- ▶ *Mean duration of utterance:* Conditions equal at immediate test; Phrase condition significantly worse at delayed test
- ▶ *Initial Pause:* Phrase condition has significantly longer IP at immediate and delayed post-tests



# Results- Test

## ▶ Preterit/Imperfect

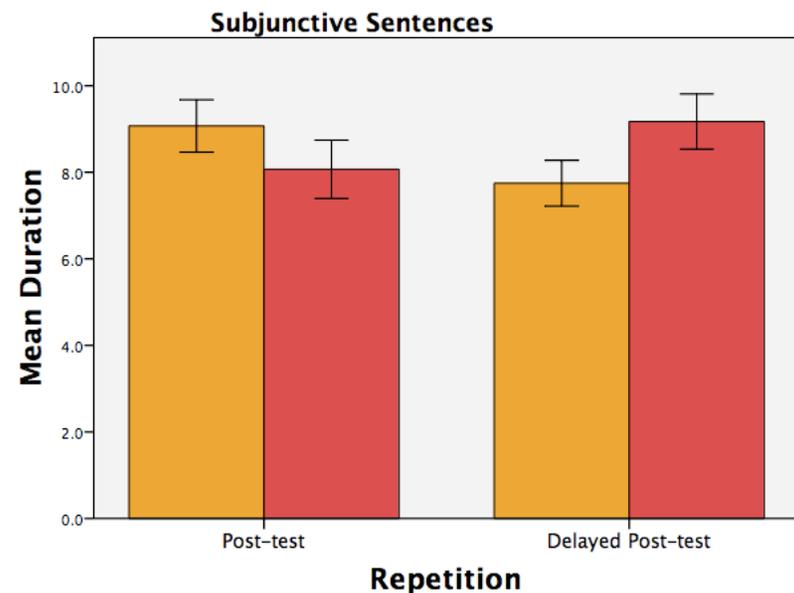
- ▶ *Mean duration of utterance:* Conditions equal at immediate test; Phrase condition significantly worse at delayed test
- ▶ *Initial Pause:* Phrase condition has significantly longer IP at immediate and delayed post-tests
- ▶ *Errors:* Phrase condition has significantly fewer errors



# Results- Test

## ▶ Subjunctive

- ▶ *Mean Duration of Utterance:* Phrase condition has (not significantly) longer MDUs at immediate test, shorter MDU at delayed test; Sentence condition decays, Phrase condition improves



Legend

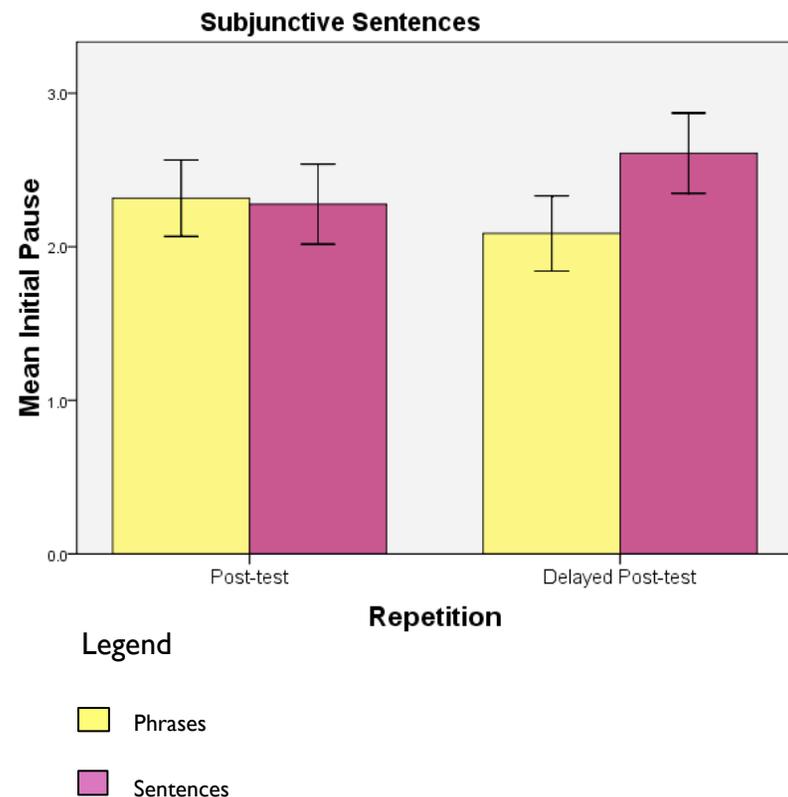
■ Phrases

■ Sentences

# Results- Test

## ▶ Subjunctive

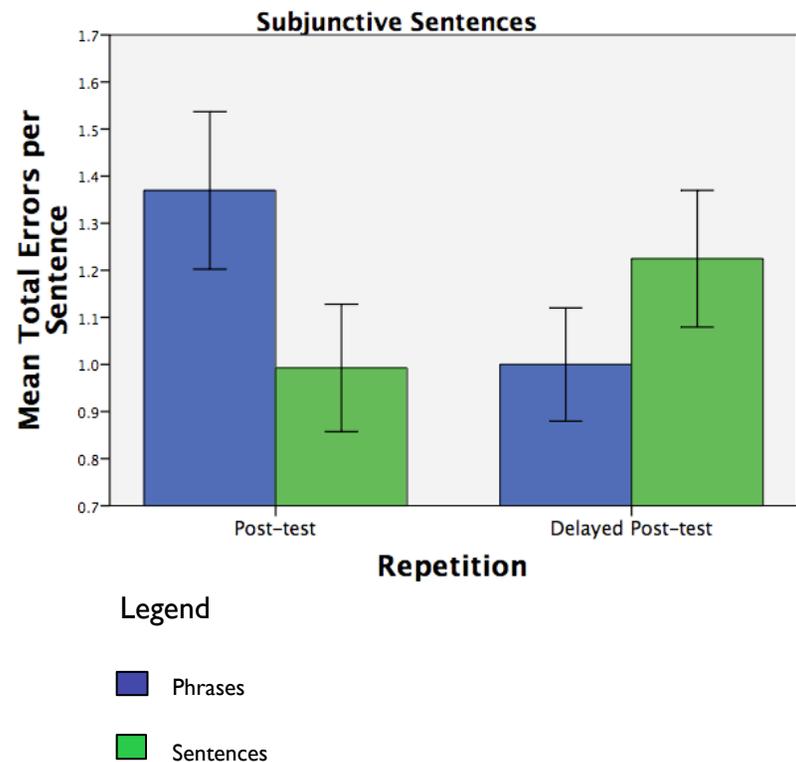
- ▶ *Mean Duration of Utterance:* Phrase condition has (not significantly) longer MDUs at immediate test, shorter MDU at delayed test; Sentence condition decays, Phrase condition improves
- ▶ *IP:* No difference at immediate; At delayed, Phrase condition has significantly shorter IPs



# Results- Test

## ▶ Subjunctive

- ▶ *Mean Duration of Utterance:* Phrase condition has (not significantly) longer MDUs at immediate test, shorter MDU at delayed test; Sentence condition decays, Phrase condition improves
- ▶ *IP:* No difference at immediate; At delayed, Phrase condition has significantly shorter IPs
- ▶ *Errors:* Similar pattern.



# Results- Summary

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## ▶ *Training*

- ▶ Both conditions lead to improvement; most native-like production for Phrase condition, most improvement for Sentence condition

## ▶ *Test*

- ▶ *Preterit/Imperfect*: Fluency/accuracy tradeoff, with fluency winning.
- ▶ *Subjunctive*: After initial lower performance during immediate post-test, Phrase condition has higher performance at delayed post-test; Sentence condition sees decay between tests

# Results- Summary

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## ▶ Robustness

- ▶ *Preterit/Imperfect*: Phrase condition decays between two tests; Sentence condition stays the same
- ▶ *Subjunctive*: Phrase condition improves for delayed post-test; Sentence condition decays

## ▶ Generalizeability

- ▶ Trained sentences are overall clinically, but not statistically significantly better ( $p < 0.15$ )
- ▶ Lack of pre-test doesn't allow us to say whether it's because of little overall improvement or because participants are able to generalize to new verbs

## What Have We Learned?

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- ▶ Repetitive practice improves performance during training
- ▶ Sentences that have received practice are possibly better than those that have not
- ▶ For complex sentences, breaking down into phrases leads to more robust learning
- ▶ For long sentences, practicing as full sentences helps performance



# What have we NOT learned?

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- ▶ **Does practice lead to actual significant improvements?**
  - ▶ No pre-test in previous studies, so we cannot compare before and after training
- ▶ **What are students actually improving on?**
  - ▶ Ability to repeat sentences?
  - ▶ Ability to conjugate verbs?
  - ▶ Ability to retrieve lexical items?
  - ▶ Ability to choose verb tense?
  - ▶ Understanding the task?
- ▶ **Are pictures really necessary?**
  - ▶ Hard to use
  - ▶ Limited usability (concrete nouns and verbs only)



## Current Study

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- ▶ Compares Picture Task (Study 2) to Repetition Task (with no pictures)
- ▶ Uses 3 tests, given at 3 separate times (pre-, immediate post- and delayed-post) to track development of speaking skills
- ▶ Rather than comparing learning of different sentence constructions, we compare learning of different words



# Design

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- ▶ Within-subjects
- ▶ Each subject receives training with and without pictures.
- ▶ Three verb lists: Participants trained on two (one with pictures, one without) and tested on all three.
- ▶ Three pre- and post-test measures.



# Stimuli

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- ▶ **Preterit/Imperfect (like Study 2)**
  - ▶ Ayer tu fuiste de pesca y yo monté la bicicleta.
- ▶ **Present & Future**
  - ▶ Si tu cocina la cena, yo limpiaré la cena.
- ▶ **Cue + Subj/Verb + Subj/Verb**



# Test Measures

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- ▶ *Repetition Test (Rep)*

- ▶ Participants listen to and repeat sentences they hear (like training)

- ▶ *Word Combining Test (Word)*

- ▶ Participants are given Cue, Subj1/Verb1, Subj2/Verb2, and create sentences (example)

- ▶ *Translation Task Test (Trans)*

- ▶ Participants given English sentence, translate into Spanish.
  - ▶ Ex: “If I go swimming, you will ride your bike.” → “Si yo nado, tu montarás la bicicleta.”



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Si

Ella/aspirar

Tu/limpiar

▶ “Si ella aspira el piso, tu limpiarás.”

# Test Measures

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- ▶ *Repetition Test (Rep)*

- ▶ Participants listen to and repeat sentences they hear (like training)

- ▶ *Word Combining Test (Word)*

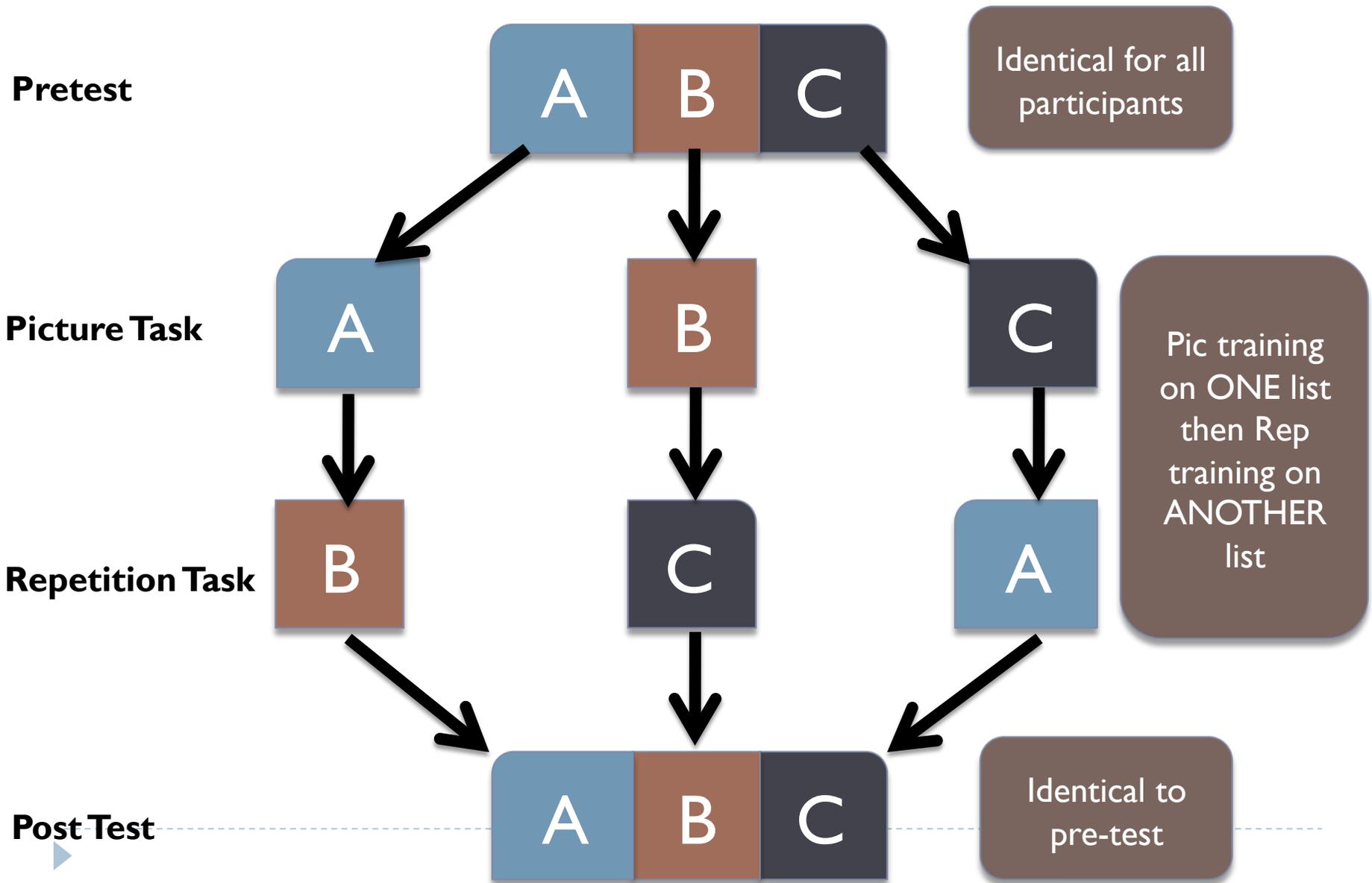
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- ▶ *Translation Task Test (Trans)*

- ▶ Participants given English sentence, translate into Spanish.
  - ▶ Ex: “If I go swimming, you will ride your bike.” → “Si yo nado, tu montarás la bicicleta.”



# Session I



## Session 2

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- ▶ **Delayed post-test**
  - ▶ Identical to pre- and immediate post-test
- ▶ **Individual Differences tasks**
  - ▶ Number Span
  - ▶ Flanker Task
  - ▶ Letter Span n-back task



# Hypotheses

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- ▶ Training includes:
  - ▶ Sentence structure
  - ▶ Morphosyntax
  - ▶ Lexical retrieval
- ▶ Lexical retrieval should be item-specific
- ▶ If morphosyntax is item-specific, we should see a difference between trained and non-trained verbs
- ▶ If sentence structure is trained, we should see improvement across the board



# Participants

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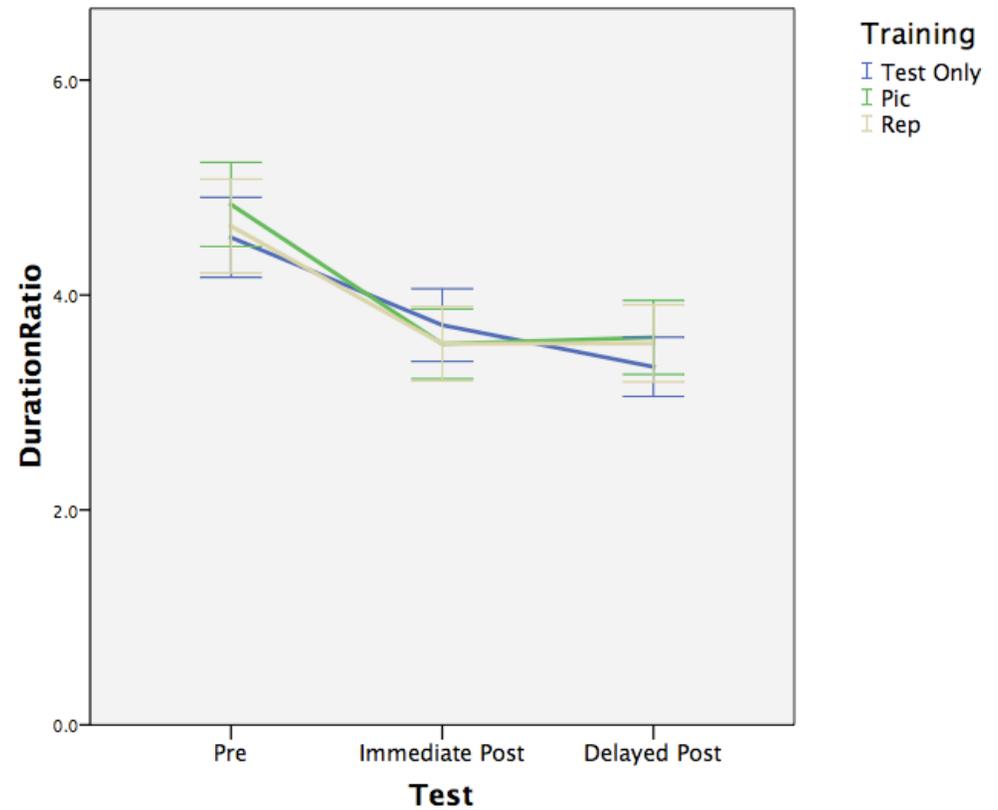
- ▶ 30 Spanish students at Pitt and CMU
- ▶ Participants must be currently enrolled in 3<sup>rd</sup> semester Spanish or above
- ▶ 23 participants have ALL test data available
  - ▶ 2 participants had major computer problems; did not receive full training
  - ▶ 5 participants did not receive one post-test (Repetition)
- ▶ Currently 8 participants' test data is analyzed
  - ▶ Duration Ratio: Participant Duration/Native Speaker Duration
  - ▶ Initial Pause



# Results

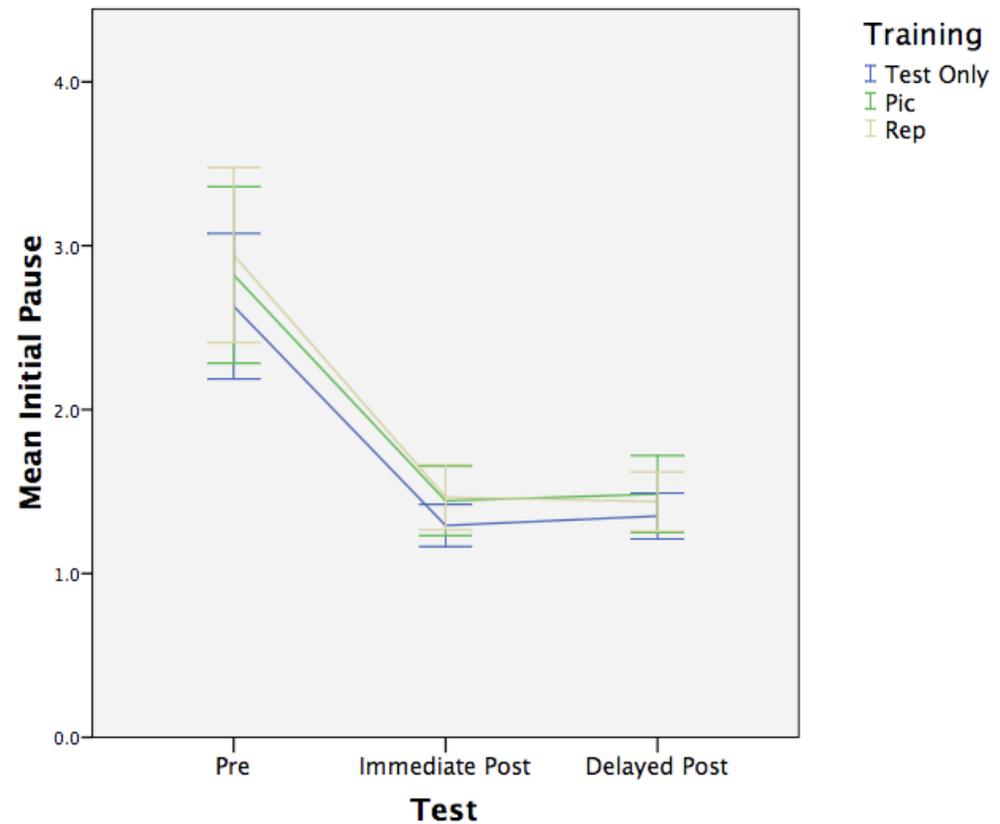
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- ▶ **Effects of training**
  - ▶ Participants improve from training.
  - ▶ No effect of type of training (Test Only no different from either type of trained sentence)



# Results

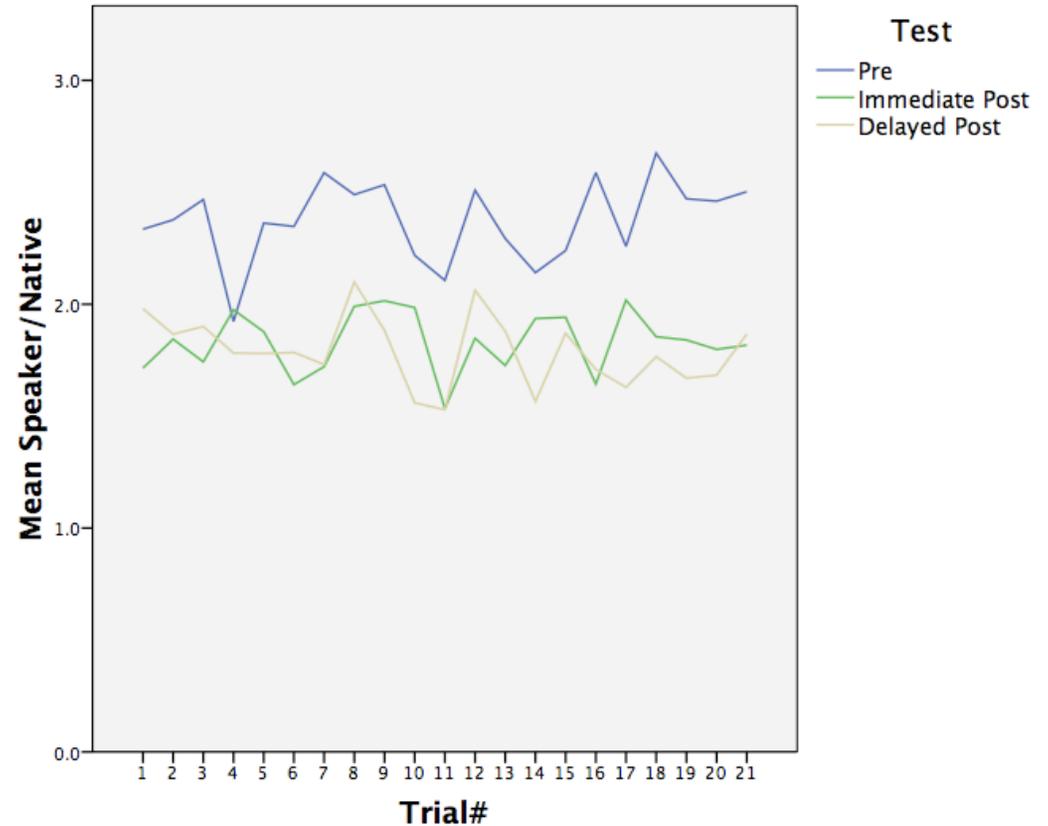
- ▶ **Effects of training**
  - ▶ Initial Pause also decreases significantly from pre- to post-test



# Results

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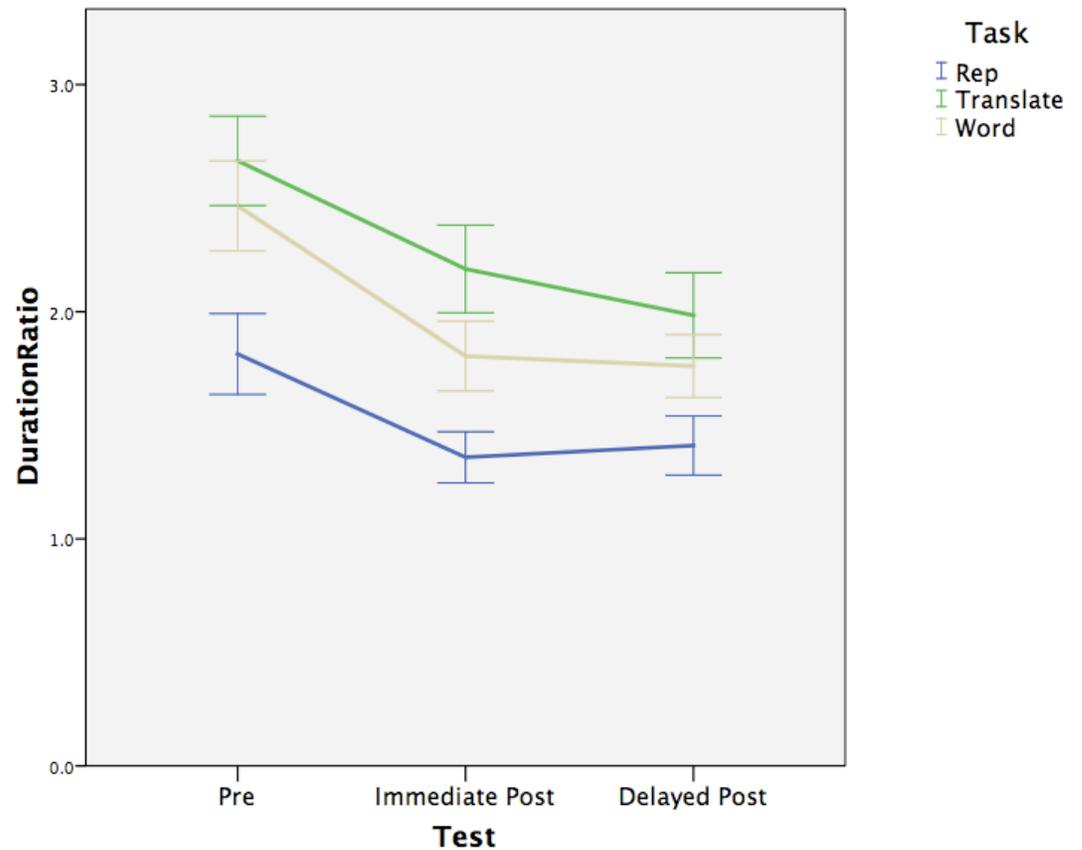
- ▶ And no, it's probably not just because they're learning how to do the tasks.
- ▶ Last trial of pre-test worse than first trial of immediate post-test (random order)



# Results

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- ▶ Differences between tasks
  - ▶ Performance best on Repetition task
  - ▶ Most improvement or Word task (not significant)



# Future Analyses

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- ▶ Errors
- ▶ Differences between test measures
- ▶ Item analysis: Are some verbs harder than others- less known verbs, irregular verbs, etc.
- ▶ Individual Differences: Spanish level, pre-test scores & WM scores may affect ability to perform task
- ▶ Suggestions?



# Acknowledgements

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- ▶ **My committee:**
  - ▶ Brian MacWhinney
  - ▶ David Plaut
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- ▶ Ziana Lissange-Bagot
  
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